PACIFIC JOURNAL OF MEDICAL AND HEALTH SCIENCES

(A Journal of the Pacific Group of Institutions in the Medical and Health Sciences)
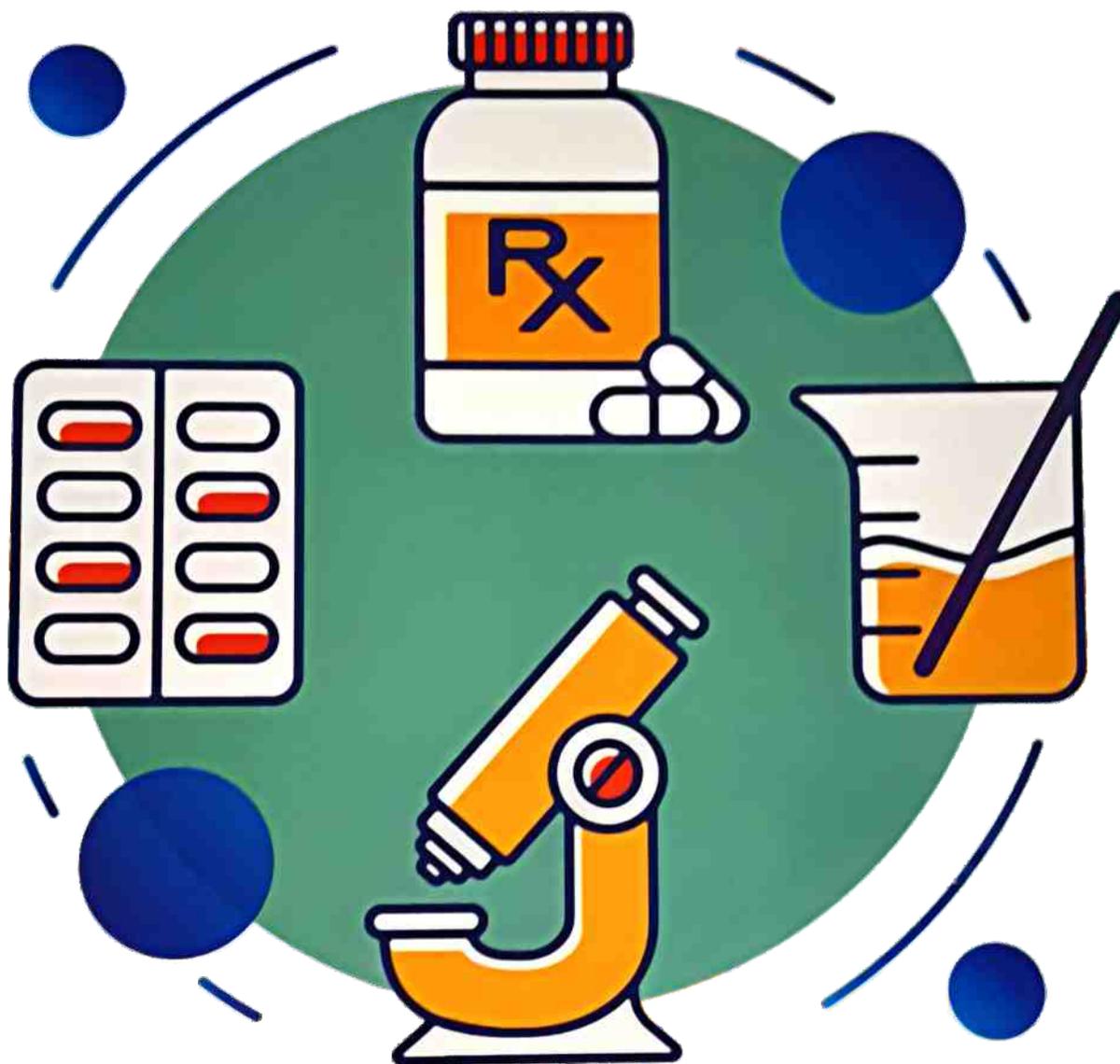
Building Trust in Tomorrow's Medical Breakthroughs

Global health trends have undergone a dramatic shift since 1990 — Chronic diseases such as Heart Disease, Cancer and Diabetes have replaced infectious diseases and malnutrition-related childhood illnesses as the leading causes of death and disability worldwide.

In the history of medicine, we have witnessed advances that have rewritten the script for preventing and treating disease. Consider the reduction in common infectious diseases owing to public health measures, vaccines, and antibiotics, or the decline in cardiovascular disease morbidity and mortality due to advances in prevention and therapy. Today, we are witnessing an even more accelerated trajectory with the convergence of basic science, data science, and technology. We have seen substantial progress in many fields — biomedicine, biotechnology, engineering, nanotechnology, digital technology, robotics, artificial intelligence (AI) — all with the potential for improving health.

It will take dramatic advances in medicine along with other changes to address these challenges if we want to live longer and healthier. New technologies and treatments — precision medicine, digital therapeutics, 3D printing, immunotherapy, gene and stem cell therapies and artificial intelligence — have arrived or are on their way.

This impact will be apparent for diseases with the highest burden such as cardiovascular disease and cancer. For example, a new class of drugs, known as PCSK9 inhibitors, are fully humanized monoclonal antibodies that inactivate PCSK9 and lower LDL (low-density lipoprotein) cholesterol when combined with a statin, reducing the risks of heart attack, stroke, or heart failure. Cancer immunotherapies harness the body's own immune system to fight tumors by either stimulating the activities of specific components of the immune system (such as chimeric antigen receptor T cell therapy) or counteracting signals produced by cancer cells that suppress immune responses (such as checkpoint inhibitors). Likewise, scientific and technological developments may lead to improvements in prevention and early detection of tumors using biomarkers, genomics, and other "omics." Advances, such as genome editing using CRISPR-Cas, may offer a cure for some diseases. Germline editing could cure diseases with permanent intergenerational changes (e.g., cystic fibrosis). Somatic genome editing could treat, control, and possibly cure acquired diseases. Advances in precision medicine, particularly the development of new diagnostics, may help to guide health care decisions toward the most effective treatment for a given patient or subset of patients, thus improving quality care while reducing ineffective diagnostic testing or treatments.

Some of the most important advances are in the areas of digital technology and big data. Vast amounts of health data are being generated and captured in real time, which will play a critical role in the development of a learning health system. The ability to integrate these data from disparate sources and analyze them will enable us to better understand patterns of disease and drivers of health, especially the social determinants of health. AI may improve health care by helping clinicians to make better diagnoses and treatment decisions and by transforming the way that patients make personal and health care decisions. In the future, AI-based personal health assistants could support patients in achieving better health, e.g., by reminding them when to take their medications. Advances in digital and AI technologies are likely to change the way health care is delivered, when care is delivered, whom care is delivered by, and where care is delivered. The overall result will be a shift away from the clinic, with care delivered in new settings, such as the home, and a greater focus on prevention. Health care will be increasingly democratized with better access to health information, and new technologies will give patients greater freedom to make choices about their own health care. Although sophisticated medical technology is already available in health systems in developed countries, further advances are constantly being made. As a result of the addition of medical nanotechnology to existing knowledge of molecular and cellular biology, it seems likely that new, more personalised, more accurate and more rapid diagnostic

techniques will be devised in the future, as well as new treatments that are also more personalised and promote regeneration of the organism.

Additionally, patients and caregivers are demanding change. Dissatisfied with poor service and lack of transparency around price, quality and safety, today's healthcare consumers expect solutions that are coordinated, convenient, customized and accessible.

Trust in medical advances is critical.

But there is another essential factor to ensure people embrace dramatic medical breakthroughs and ensure that the next miracle drug or therapy comes to fruition: Trust.

Trust is so fundamental to the patient-physician relationship that it is easy to assume it exists. But because of changes in health care and society at large, trust is increasingly understood to be at risk and in need of attention.

In the next decade, transformative changes will take place in health and medicine resulting from rapid advances in science and technology in the Fourth Industrial Revolution. Medical and technological breakthroughs will provide new tools and approaches that will transform health and health care, rendering them more connected, precise, democratized, and people-centered with better outcomes and improved population health. However, emerging technologies inevitably have risks. The challenges will be significant in the extent and speed of adoption, as well as the ability to control cost of care and to prevent aggravating inequity. The extent to which the benefits are maximized and the risks mitigated depends on the quality of governance—the policies, norms, standards, and incentives that shape the development and deployment of these emerging technologies. We must proactively assess technologies on the horizon and their societal implications and take intentional measures to mitigate their risks.

(Ravindra Bangar)
Editor

I N D E X

A Study of Cases of Fournier's Gangrene in Pacific Medical College, Udaipur

Gurudutt Bhaskar Basrur

MS, FRCS. Professor of Surgery,
Pacific Medical College and Hospital,
Bhilon ka Bedla, Pratappura, Udaipur (Raj.)

Vijendra Kumar Choudhary

MBBS. Intern, Pacific Medical College and
Hospital, Bhilon ka Bedla, Pratappura,
Udaipur (Raj.)

ABSTRACT

Background: Pacific Medical College & Hospital (PMCH) is a 900 bedded, multispecialty, tertiary level health care centre with state of the art equipment, infrastructure & a team of highly experienced, qualified, skilled & motivated teachers, doctors and technical manpower. The hospital has well established departments both in diagnostic & therapeutic fields as well as in supporting logistics services.

Keywords: Fournier's Gangrene, Necrotising Fasciitis, Debridement

INTRODUCTION

Fournier's Gangrene (FG) is also called as idiopathic gangrene of the scrotum is a fulminant fasciitis synergistic necrotizing fasciitis of the genital, and perianal region that leads to obliterative arteritis of the arterioles of the scrotal skin thrombosis of the small subcutaneous vessels and results in the development of gangrene of the overlying scrotal skin[1].FG is an acute surgical/urological emergency[1] with a mortality rate varying from 15–50%. It is common in diabetics, old age, poor general hygiene, malnutrition and immune compromised individuals. Although FG was first described by Baurienne over 100 years previously, in 1764[2] Jean Alfred Fournier gave the condition its eponymous name in 1883. Since then, the epidemiology and clinical features of the disease have changed significantly. Our understanding of the pathogenesis also has improved greatly and a modern multidisciplinary approach to treatment has been adopted. FG has a high death rate, ranging from and. The central principles mainstay of management are aggressive debridement, broad spectrum antibiotics, and intensive supportive care and meticulous post-operative wound care has improved the prospects of patient survival. In this research paper, we have made an effort to study analyze our experiences and cases of FG in PMCH to define and analyse the etiological factors, surgical and multi-modality treatment, and our efforts towards meticulous daily dressing, wound improvement, healing, outcome and patients' survival.

Fig.1. A Case of Fournier's Gangrene

METHODS

In our retrospective study, the medical records of three patients were consecutively admitted to our institution during a four year period, between January 1014 to December 2019, were retrospectively

reviewed analysed. The cases were diagnosed and included in the study on clinical grounds by taking elaborate history and thorough local examination. Cases with scrotal and perianal abscess were excluded. Patients with a simple scrotal or perirectal abscess without necrotizing infection were not included in this series. The patient's age, etiology, predisposing factors, microbiological findings, duration of hospital stay, treatment, and outcome were analysed. The patients were treated managed with triple antimicrobial therapy (broad-spectrum antibiotics, aminoglycoside, and metronidazole), thorough debridement, meticulous cleaning, and then they underwent split-thickness skin grafts or delayed closure as needed. They had no immunological problems. The patients were admitted to surgical ward, broad spectrum triple antibiotics were given, pre-operative investigations done and emergency meticulous debridement, and exhaustive cleaning under anaesthesia was performed and sample collected for culture and sensitivity. Post operatively, their wounds were inspected, cleaned with normal saline and then dressed with topical antibiotic ointment daily.

RESULTS

The mean age of the patients was 53 years (range = 40–69) years. The mean duration of hospital stay was 12 Days (range = 08–16) days. The patients had a mean length of hospitalization of 10 days (range = 06-15) days. The source of the gangrene was per cutaneous in 2 patients, urinary in 1 patient and perirectal in 2 patients (Chart 1).

SOURCE OF INFECTION
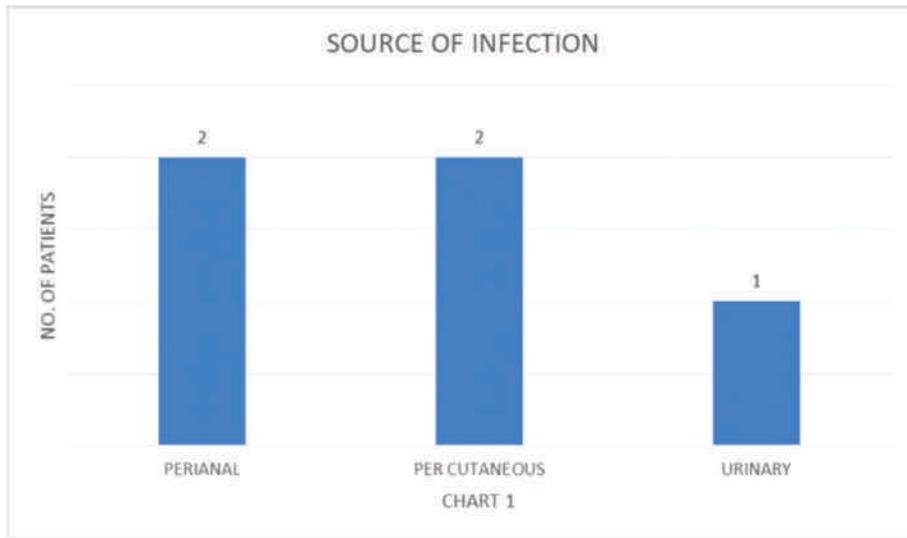
CHART 1

The predisposing factors (Chart 2) included diabetes mellitus in 1 patient (20%), alcoholism in 4 patients (80%). Smoking in 3 patients and 1 patient is immunosuppressed. In our study, all patients were from a lower socioeconomic strata with poor hygiene.

PREDISPOSING FACTORS

Chart 2
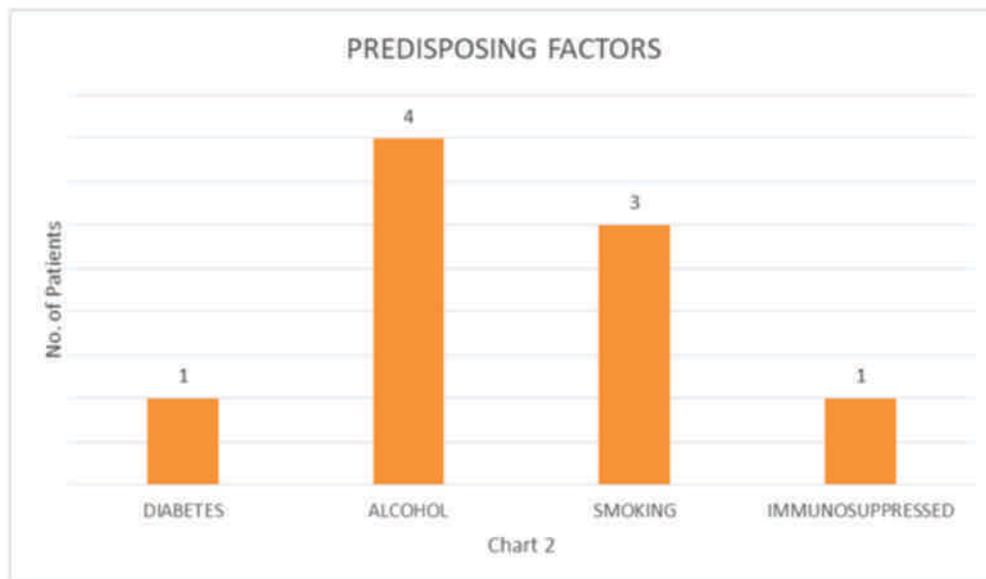
Of the lesions, 50% (n = 3) the gangrene involved the scrotum only, in 25% (n = 1) gangrene was located on the penis and scrotum and in remaining 25% (n = 1) involved the scrotum and perineum. The presenting symptoms included scrotal oedema in 5 patients (100%), scrotal pain in 4 patients (80%), crepitus in 3 patients (60%), feculent odour in 3 patients (60%), and fever > 38°C in 3 patients (60%). 1 patient had leucocytosis on presentation. The total number of surgical debridement was five. Pus samples obtained for culture and sensitivity revealed Escherichia coli in 2 patients (40%), Pseudomonas spp. in 2 patient (40%). Mixed flora (aerobic and anaerobic microorganisms or no growth in 1 patients (20%) (Chart 3).

Chart 3. Microbiological Findings
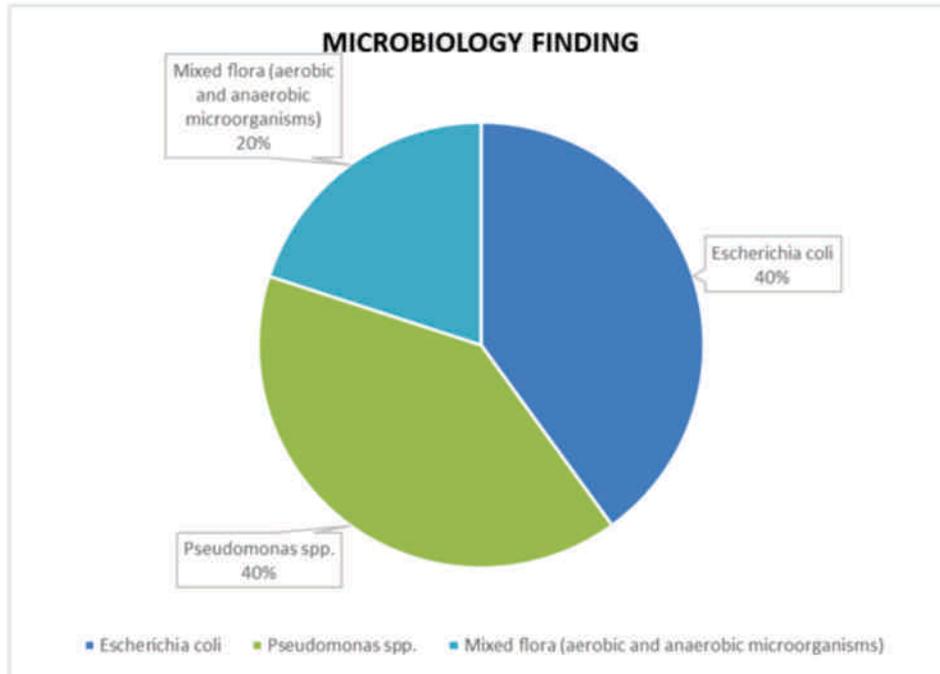
Fig.2. Appearance of the Wound after the Debridement

The progress and outcome was better in all our patients. All of the patients had a localized disease (localized to the genital or scrotal region and $\approx \leq 8$ cm in size). In 2 patients, scrotum and penis healed well with post-operative measures like meticulous wound care without any additional therapy. In contrast, in the third case, the scrotal skin was closed by secondary suturing and/or skin grafting.

Fig.3. Appearance After Secondary Suturing Or Skin Grafting

DISCUSSION

FG was first described by Baurienne over 100 years ago, but in 1764[2] Jean Alfred Fournier gave the condition its eponymous name. It is a rare condition with considerable morbidity and mortality if not treated aggressively. The peak age of incidence is 40– 50 years[3]. The mean age of our patients was 52 years. Diabetics, alcoholism, poor personal hygiene and immunocompromised individuals are more predisposed to FG.

The patients usually presents with pain in the scrotal area, scrotal swelling, odour and fever[4].In our patients, 5 patients (100%), presented with scrotal oedema, 4 patients (80%) with scrotal pain, crepitus was found in 3 patients (60%), feculent odour in 3 patients (60%), and fever > 38°C in 3 patients (60%). 1 patient had leucocytosis on presentation.

The exact aetiology of FG is not known. Initially, due to trivial trauma, cutaneous, urogenital and anorectal spread, otherwise less virulent organisms sets in obliterative endarteritis of arterioles of scrotal skin and subcutaneous tissues resulting in vascular thrombosis and tissue necrosis. The FG is a polymicrobial infection by both aerobes and anaerobes particularly organisms of normal ano-rectal, urogenital and skin flora particularly E coli, Bacteroides, Pseudomonas spp. Streptococcus, Staphylococcus and Clostridia. Both aerobic and anaerobic organisms set in cascade of infection with the help of various proteins, enzymes resulting in thrombosis and gangrene. Local crepitus observed in some cases is due to formation of hydrogen and nitrogen by anaerobic organisms[5].

The main hallmarks of management of FG are timely surgical intervention in the form of liberal debridement, triple antimicrobial therapy, aggressive haemodynamic stabilisation and meticulous post-operative care. During debridement even doubtfully viable tissues should be sacrificed. Testes and spermatic cords are not involved as they have an independent blood supply, hence not excised. Indwelling urethral catheterization and even (rarely) suprapubiccystostomy may be needed to prevent spillage of urine on the operated area. The importance of daily wound care in the form of meticulous dressings goes in the long way in early recovery and patient's survival.

CONCLUSION

FG is an acute surgical emergency[1] with a high mortality rate. Timely surgical intervention in the form of liberal debridement, triple antimicrobial therapy, aggressive haemodynamic stabilisation and meticulous post-operative care can improve the outcome and patient survival.

REFERENCES

1. Eke N. Fournier's gangrene: a review of 1726 cases. Br. J. Surg. 2000; 87: 718–28.

2. Quatan N, Kirby RS. Improving outcomes in Fournier's gangrene.BJU Int. 2004; 93: 691–2.

3. Jones RB, Hirschmann JV, Brown GS et al. Fournier's syndrome: necrotizing subcutaneous infection of the male genitalia. J. Urol. 1979; 122: 279–82.

4. L Tahmaz et al. gangrene Fournier's gangrene: Report of thirty-three cases and a review of the literature. International Journal of Urology (2006) 13, 960–967

5. Clay L, White J, Davidson J, Chandler JJ. Early recognition and successful management of pelvic cellulitis following haemorrhoidal banding.Dis. Colon Rectum 1986; 29: 579– 81.

Neonatal Outcomes in Women with Isolated Oligohydramnios

Dr Rajrani Sharma

Senior Professor and Head of Department,
Department of Obstetrics and Gynecology,
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr Rekha Garasiya

Resident, Department of Obstetrics and
Gynecology, Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

ABSTRACT

Oligohydramnios is a serious complication of pregnancy that is associated with a poor perinatal outcome. Isolated oligohydramnios at term is defined as AFI <5 cm without any maternal or fetal cause. Incidence of isolated oligohydramnios is 0.5-1% at term. It can be used as an adjunct to other fetal surveillance method to identify those infants at risk of poor perinatal outcome.

The number of studies dealing with isolated oligohydramnios at term and its outcome in Indian setup is limited. Therefore this study is conducted to determine the perinatal outcome in cases of isolated oligohydramnios coming to Pacific medical college and hospital, Bhillo ka bedla.

Method: Consisted of analysis of pregnancy outcome in 50 cases diagnosed as oligohydramnios by ultrasound after 37 completed weeks of gestation (Cohort 1) compared with 50 controls (Cohort 2) and matched for other variables like age, parity, gestational age. Various outcomes were recorded, tabulated and analyzed.

Results: In our study occurrence of non reassuring NST, lower neonatal birth weight, low normal value of cord blood pH was higher in the study group when compared to control group. There was no statistically significant difference in the occurrence of adverse neonatal outcomes except for lower birth weight among neonates born to oligohydramnios mothers.

Conclusion: The presence of isolated oligohydramnios in the absence of other complicating maternal and fetal causes does not conclusively predict adverse perinatal outcomes.

INTRODUCTION

Amniotic fluid plays a major role in the fetal growth and development. It provides the fetus with a protective environment suitable for growth and development. Abnormalities of the fluid volume can interfere directly with fetal development or it may be an indirect sign of underlying disorder such as fetal hypoxia, neural tube defect or gastrointestinal obstruction.

In present practice, AFI assessed in antenatal period helps to identify women who need increased surveillance for pregnancy complications. It can also be used as an adjunct to other fetal surveillance method to identify those infants at risk of poor perinatal outcome.

Oligohydramnios is a serious complication of pregnancy that is associated with a poor perinatal outcome. Phelan defined oligohydramnios as amniotic fluid index (AFI) < 5 cm from 36-42 wks of gestation [1]. It occurs in about 1-5% of pregnancies

at term [2]. Isolated oligohydramnios at term is defined as AFI <5 cm without any antenatal maternal or fetal complications. Many studies show that isolated oligohydramnios is associated with variety of ominous perinatal outcomes, such as fetal distress, low birth weight, perinatal morbidity, perinatal mortality. [3,4]

However, the above observation is refuted by studies that prove amniotic fluid index is a poor predictor of adverse outcome and even the existence of an entity like isolated term oligohydramnios has been questioned by some authors. Thus this study was conducted to determine whether antepartum AFI of 5 cm or less can be used as a predictor of adverse perinatal outcome [5,6,7,8].

Materials and Methods

This study was conducted at Pacific medical college and hospital , Bedla for a period of 12 months (Jan 2019 to December 2019) and included the inpatients admitted to the labor ward during this period. 100 patients were included of which 50 belonged to the isolated oligohydramnios group and 50 to the control.

A. Inclusion Criteria

➢ Low risk pregnancy with gestational age between 37 to 42 weeks with intact membranes.

➢ Singleton pregnancy.

B. Exclusion Criteria

➢ Medical disorder of pregnancies - like diabetes, hypertension, renal disease and pre-eclampsia.

➢ Congenital anomalies of the fetus. Method of collection of data

➢ Patients were recruited after taking informed consent.

➢ Women with AFI < 5 / AFV <500 ml at more than 37 weeks of gestation were included in the case group and AFI > 5 cm were considered as controls.

➢ All cases were monitored by electronic fetal monitoring. If any fetal distress was present, operative intervention were undertaken.

➢ Cord blood ABG was done immediately afterthe birth of the baby to rule out acidosis and thus the presence of any fetal distress.

➢ Birth weight, APGAR scores at 1 minute and 5 minutes was noted and baby was admitted to Neonatal intensive care unit as and when required.

Flow Chart Showing Management Protocol for Study Group
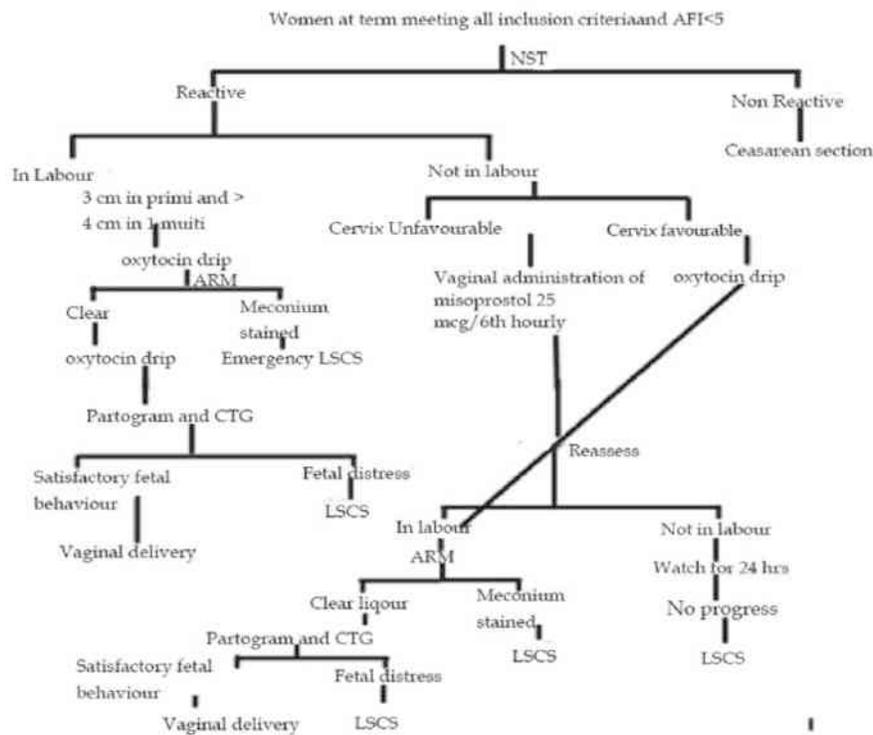
Statistical Analysis

Various fetal outcomes like APGAR score of the child, NICU admission etc. were considered as outcome variables.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Data was also represented using appropriate diagrams. Both the groups (Oligohydramnios and control) were compared with respect to all the potential confounding baseline variables. Chi square and fischer's exact test were used to test statistical significance. P value < 0.05 was considered statistically significant.

Results

Among the population included, the 50 people were controls and 50 people had Oligohydromnios. (Table 1)

Table 1: Descriptive Analysis of Study Group in Study Population (N=100)

Study Group	Frequency	Percentage
Control	50	50.00%
Oligohydromnios	50	50.00%

(Source: Primary Data)

The mean age for study group and control group were 22.54 years and 22.24 years respectively. Most of them were primigravid as and the mean gravidity was 1.3 in study group and 1.8 in control group. Only those with good dates were taken for study and all had completed 37 weeks of gestation and mean gestational age was 37.56 weeks for study and 39.36 for control group (Table 2, Fig 1).

Among the Control group was 48 (96%) had reassuring NST at admission and 2(4%) had nonreassuring NST. The number of reassuring and non-reassuring NST was 42 (84%) and 8(16%) in oligohydramnios group. The difference between study groups with respect to NST at admission was statistically significant (P value 0.05). Women with non reassuring NST in both study and control group at admission were taken up for caesarean.

Among the Control group 1(2%) woman each had early and variable NST pattern. Among the Oligohydramnios group 1(2%) woman each had early and late deceleration and 6(12%) women had variable deceleration (Table 3) (Fig 2).

Among the Control group 15 (30%) women had babies with birth weight 2.0-2.5 kg. In the Oligohydromnios group 30(60%) women had babies with birth weight 2.0-2.5 kg. The difference

Table 2: Admission NST of Study Population (N=100)

Admission NST	Study Group		Chi Square	P-value
	Control (N=50)	Oligohydromnios (N=50)		
Reassuring	48 (96%)	42 (84%)	4.000	0.05
Non-Reassuring	2 (4%)	8 (16%)		

(Source: Primary Data)
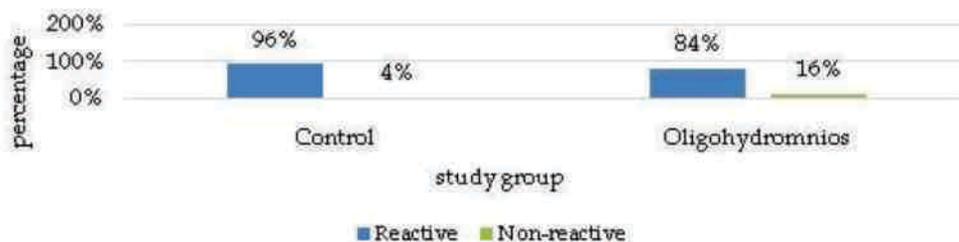
Fig 1: Bar chart of Admission NST Distribution in Study Group (N=100)

Table 3: Distribution of NST Patterns among the Study Population (N=100)

	Study Group	
	Control (N=50)	Oligohydromnios (N=50)
Reassuring	48 (96%)	42 (84%)
Early	1 (2%)	1 (2%)
Variable	1 (2%)	6 (12%)
Late	0 (0%)	1 (2%)

(Source: Primary Data)
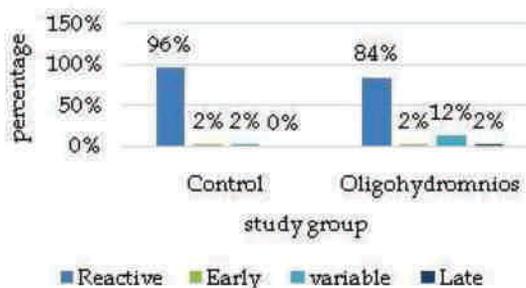
Fig 2: Bar chart of NST Distribution in Study Population (N=100)

Table 4: Distribution of Birth Weight in Study Population (N=100)

| Birth weight | Study Group | | Fishers' exact test | |
	Control (N=50)	Oligohydromnios (N=50)	Chi Square	P-value
2.0-2.5 kg	15 (30%)	30 (60%)	13.44	<0.001
>2.5-3.0 kg	30 (60%)	12 (24%)		
>3.0-3.5 kg	4 (8%)	6 (12%)		
>3.5 kg	1 (2%)	2 (4%)		

(Source: Primary Data)

Table 5: Association of Study Group with Apgar at 5 min of Study Population (N=100)

| Apgar at 5 min | Study Group | | Chi Square | P-value |
	Control (N=50)	Oligohydromnios (N=50)		
7	1 (2%)	1 (2%)	1.043	0.59
8	1 (2%)	3 (6%)		
9	48 (96%)	46 (92%)		

(Source: Primary Data)

Table 6: Distribution of NICU Admission in Study Population (N=100)

| NICU admission | Study Group | | Chi Square | P-value |
	Control (N=50)	Oligohydromnios (N=50)		
Yes	2 (4%)	6 (12%)	2.174	0.14
No	48 (96%)	44 (88%)		

(Source: Primary Data)

Table 7: Association of Study Group with Cord Blood PH of Study Population (N=100)

| Cord blood pH | Study Group | | Chi Square | P-value |
	Control (N=50)	Oligohydromnios (N=50)		
7.20-7.24	2 (4%)	12 (24%)	8.306	<0.001
7.25-7.28	48 (96%)	38 (76%)		

(Source: Primary Data)

between groups with regards to birth weight was statistically significant (P value <0.001) (Table 4).

Among the control group 1 (2%) neonate had Apgar at 5 min of 7. The number of neonates with 8 and 9 APGAR at 5 min were 1(2%) and 48(96%) respectively. In the Oligohydromnios group 1(2%) neonate had APGAR at 5 min of 7. The number of neonates with 8 and 9 as APGAR at 5 min were 3(6%) and 46(92%) respectively. The difference between study groups with regards to APGAR at 5 min was statistically not significant (P value 0.59) (Table 5).

Among the control group only two neonates were admitted in NICU, the number of neonates from oligohydromnios group who were admitted to NICU was 6(12%) (Table 6).
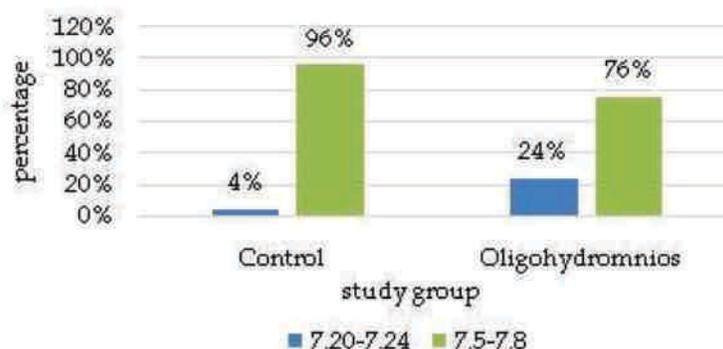
Fig 3: Bar chart of Cord blood PH between Study Group Distribution in Study Group (N=100)

Among the control group 2 (4%) neonate had a cord blood pH of 7.20-7.24, and 48 (96%) had a cord blood pH of 7.5-7.8. In the oligohydromnios group 12 (24%) neonates had a cord blood pH of 7.20-7.24, and 48 (96%) had a cord blood pH of 7.5-7.8. The difference between study groups with regards to cord blood pH was statistically significant (P value <0.001) with 12 neonates having a cord blood pH in low normal value (Table 7).

Discussion

A prospective comparative study conducted in SDUMC, Kolar from November 2015 to July 2017, to analyze the pregnancy outcome in term isolated oligohydramnios and normal pregnancies after matching the demographic variables.

Non Stress Tests

The non reassuring NST rates were high in women with AFI <5 cm. There was statistically significant difference in the occurrence of non reassuring NST in the oligohydramnios group then control group. The rate of non reassuring NST is 40%, 69.23% and 41% in studies conducted by Kumar P et al., Chandra et al. [10], Sriya R et al. [12] respectively. In present study only 16% cases had non reassuring NST which was less when compared to other similar study.

Birth Weight

In this study it was seen that there was statistically significant difference between the birth weight of the neonates born to women with AFI <5 cm This correlated with the findings of other studies like Chandra et al. and Sriya et al. which also showed a higher rate of low birth weight babies in the study group.

APGAR score < 7 at 5 Minutes

The 5 min APGAR score <7 is seen in 2% of oligohydramnios group. Whereas 5 min APGAR less than 7 in other studies were higher. This could be due to the fact that the above mentioned studies included oligohydramnios due to high risk maternal factors also, whereas the present study included only isolated oligohydramnios.

Admission to Neonatal Ward

12% of newborns were admitted to neonatal ward for various morbidities like birthasphyxia, meconium aspiration from study group. This is comparable to studies conducted by Magann et al. [9] (7.6%) and Casey et al. [11] (7%).

Cord Blood pH

The normal range of the cord blood pH in a new born is 7.2-7.28 immediately after birth. No babies in the study population had a pH <7.20, thus proving that none of these neonates suffered from birth asphyxia which would lead to long term squealae. There was a statistically significant difference in the number of neonates in the study group which had cord blood pH in the lower end of the normal range (12% vs 2%).

CONCLUSION

In presence of oligohydramnios, the occurrence of non-reassuring NST, abnormal FHR tracings during labor, low 5 minute Apgar score, low birth weight and perinatal mortality were concluded to be higher by earlier studies.

In our study occurrence of non reassuring NST, lower neonatal birth weight, low normal value of cord blood pH was higher in the study group when compared to control group. There was no statistically significant difference in the occurrence of adverse neonatal outcomes except for lower birth weight among neonates born to oligohydramnios mothers. Only the presence of isolated oligohydramnios in the absence of other complicating maternal and fetal causes does not conclusively predict adverse perinatal outcomes.

REFERENCES

1. Phelan JP, Smith CV, Broussard P. Amniotic fluid volume assessment with four quadrant technique at 36-42 weeks of gestation. J Reprod Med. 1987; 32:540-2.

2. Jeng CJ, Lee JF, Wang KG, Yang YC, Lan CC, Decreased amniotic fluid index in term pregnancy. Clinical Significance. J Reprod Med 1992;37:789-92.

3. S. Manzanares et al. "Isolated oligohydramnios in term pregnancy as an indication for induction of labor"J ofmat, fetal and neonatal med.2007:20:221-24.

4. Sowmya K, Varghese B Borkar Y U. Effect of isolated oligohydramnios in otherwise normal term pregnancy. IJBR 2014; 99-101.

5. Ahmad H, Munim M. Isolated Oligohydramnios is not an indicator for adverse perinatal outcome. J Pak Med Assoc 2009;10:691-94.

6. Wood. L, Newton. M, Wang. Li, Lesser. K: Borderline Amniotic Fluid Index and Its Relation to Fetal Intolerance of Labor-A 2-Center Retrospective Cohort Study: J Ultrasound Med 2014; 33:705–711.

7. Bachhav AA, Waikar M: Low Amniotic Fluid Index at Term as a Predictor of Adverse Perinatal Outcome; The J of Obstet and Gynecol of India (March–April 2014) 64(2):120–123.

8. Kavitha G. Pregnancy outcome in isolated oligohydramnios at or beyond 34 weeks of gestation. Int J Cur Res Rev 2015;7:62-68.

9. Magann EF, Kinsella MJ, Chouhan SP, et al. "Does an amniotic fluid index of < 5 cm necessitate delivery in high risk pregnancies ? A case control study". Am J Obstet Gynecol 180: 1354-1359.

10. Chandra P, Kaur SP, Hans DK, Kapila AK, Aug. "The impact of amniotic fluid volume assessed intrapartum on perinatal outcome". Obstet and Gynae Today 2000 ; 5(8): 478-81.

11. Casey BM, MC Intire DD, Donald D, et al. "Pregnancy outcome after diagnosis of oligohydramnios at or beyond 34 weeks of gestation" Am J Obstet Gynecol 2000 ; 182: 902-12.

12. Sriya R, Singhai S, et al. "Perinatal outcome in patients with amniotic fluid index < 5 cm" J Obstet and Gynaecol of India 2001; 51(5): 98-100.

Evaluation of Thyroid Disorders in Abnormal Uterine Bleeding

Dr. Rajrani Sharma

Senior Professor and HOD,
Dept.Obs & Gyne, Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Apurva Garg

Assistant Professor Dept. Obs & Gyne
Pacific Medical College and Hospital,
Bhillo ka Bedla, Udaipur

ABSTRACT

Background: Abnormal Uterine Bleeding (AUB) is a common clinical presentation in gynecology. Alteration in thyroid hormones level has been associated with menstrual disturbances. This study is aimed to know the prevalence of thyroid disorders amongst AUB patients and also the different patterns of menstrual abnormalities associated with thyroid disorders.

Methods: 100 Patient of clinically diagnosed AUB were taken from gynecology OPD. All the patients from 19 to 45 age groups presenting with menstrual disturbances were tested for thyroid function by measuring ST3, ST4, and S.TSH.

Results: Out of 100 women of AUB, majority were in the age group of 31-40 years (38%). 44% presented with menorrhagia. 65% were euthyroid, 17% had subclinical hypothyroidism, 15% had overt hypothyroidism and 3% were diagnosed as hyperthyroid. Subclinical hypothyroidism, overt hypothyroidism and hyperthyroidism were detected mostly in the age group of 31-40 years. The commonest bleeding abnormalities in hypothyroid patient were oligomenorrhoea While most of the hyperthyroid cases were having menorrhagia.

Conclusions: The study concludes that biochemical evaluation of thyroid function is an easy, reliable method and should be made mandatory in all cases of AUB.

Keywords: Abnormal Uterine Bleeding, Thyroid Disorders

INTRODUCTION

Abnormal Uterine Bleeding is a common complaint encountered in Gynaecology OPD. It occurs in 9 – 14% of women from Menarche to Menopause affecting quality of life imposing financial burden[1.] Thyroid dysfunction causes broad spectrum of reproductive disorders from abnormal sexual development, menstrual irregularities, infertility and premature menopause[2]. Thyroid disorders are 10 times more common in women and increase prevalence of thyroid disorders in women is possibly due to auto immune nature[3].Menstrual disturbances accompany clinical alterations in thyroid function and every clinician must have encountered altered menstrual pattern among women suffering from hypo or hyper thyroidism. Diseases of thyroid gland are among the most prevalent disorders worldwide second only to diabetes[4].

Term used to describe AUB3

- **Oligomenorrhoea:** bleeding occurs at interval of >35 days.

- **Polymenorrhoea**: bleeding occurs at interval of <21 days.

- **Menorrhagia**: bleeding occurs at normal interval but with a heavy flow (≥80 ml) or duration of >7 days.

- **Meno- metrorrhagia:** bleeding occurs at irregular/ non-cyclic

interval with heavy flow (≥80 ml) or duration of >7 days.

- **Metrorrhagia:** irregular bleeding that occurs between ovulatory cycles inter menstrual bleeding.

- Objective of this study is to evaluate thyroid disorder in patients with Abnormal Uterine Bleeding in reproductive age group from 15 to 45 years which will help in further management.

METHODS

It is a cross-sectional, prospective observational study, conducted on 100 women coming to Out-patient department with complaint of AUB.

Inclusion criteria

Females in age group of 15-45 years with complaint of abnormal uterine bleeding.

Exclusion criteria

Known cases of thyroid disease, hyperprolactinemia and coagulopathy and also the patients on anticoagulant drugs.

A detailed history of all the patients included in the study was taken. The detailed gynaecological history and also the detailed present and past menstrual history was taken from the patients. A detailed examination including general and gynaecological examination was done by which the obvious pelvic pathologies were ruled out. All patients were advised for routine investigations like CBC, Blood sugar, Urine routine and BT, CTand thyroid profile which included T3, T4 and TSH. Ultrasound of the pelvis was also done to rule out any pelvic pathology as the cause of menstrual irregularities.

After the reports of thyroid, the patients were diagnosed as euthyroids, subclinical hypothyroids, hypothyroids and hyperthyroids. Datas were collected and mentioned in percentages and statistical analysis done.

RESULTS

The maximum no. of patients of AUB in our study were of 31-40 years of age (38%), followed by 21-30 yrs of age (31%) (Table 1).

Table 1: Age-wise Distribution of AUB Cases

Age groups	No of patients	Percentage
<20	21	21
21-30	31	31
31-40	38	38
>40	10	10

(Source: Primary Data)

The mean age was 29.5 years. Majority of patients were multiparous with parity more than or equal to 2(34%), while 20% were unmarried and 6% nulliparous (Table 2).

Table 2: Parity of AUB patients

Parity	No of Patients	Percentage
Unmarried	20	20
Nullipara	6	6
Primipara	20	20
Para 2	34	34
≥Para 3	20	20

(Source: Primary Data)

The major menstrual complaint of AUB patients was menorrhagia (44%), 20% presented with oligomernorrhoea, 16% had polymenorrhoea.(Table 3).

Table 3: Bleeding Pattern in AUB Patients

Bleeding Pattern	No of Patients	Percentage
Menorrhagia	44	44
Metrorrhagia	10	10
Meno- Metrorrhagia	10	10
Polymenorrhoea	16	16
Oligomenorrhoea	20	20

(Source: Primary Data)

65% of the patients with AUB were euthyroid, 24% had hypothyroidism and 09% were diagnosed to be subclinical hypothyroid. 2% patients had hyperthyroidism (Table 4)

Table 4: Thyroid Dysfunction in AUB patients

	Euthyroid	Hypothyroid	Sub Hypothyroid	Hyperthyroidism
No of Patients	65	24	9	2

(Source: Primary Data)

Table 5: Distribution of different AUB Patterns in Relation to Thyroid Dysfunction

Bleeding Pattern	No of Patients	Euthyroid	Hypothyroid	Subclinical Hypothyroid	Hyperthyroid
Menorrhagia	44	36	5	2	1
Polymenorrhoea	16	11	3	1	1
Metro rrhagia	10	2	7	1	
Meno-Metrorrhagia	10	9	1		
Oligomenorrhoea	20	7	8	5	

(Source: Primary Data)

In the current study, patients with hypothyroidism (overt) presented mainly with oligomenorrhoea (8 out of 24 patients i.e.33.3%). Patients who were hyperthyroid presented with menorrhagia (Table 5).

DISCUSSION

The majority of patients of AUB (38%) were in the age group of 31-40 years in our study. Pilli et al had 58% cases in age group of 21-30 years[5]. Surendra Kumar Jinger et al in their study of 100 women with AUB had 49% in 20-30 yr age group.[6]

Pilli et al reported that AUB is seen in 87% multipara, 7% primipara and 6% nulliparous.[5] In present study also majority of patients were Para 2 (20%). Menorrhagia is the main complaint in the patients of abnormal uterine bleeding (44%) which was also seen in the studies by Pilli et al in 34%, in the study by Pahwa S et al study it was in 50% patients and in Deshmukh et al study 40% had menorrhagia.[5,7,8]

Oligomenorrhoea is the next common menstrual disorder followed by polymenorrhoea and metrorrhagia.

35 patients out of 100 patients, showed thyroid dysfunction (35%). In the study of Pahwa S et al 24% had thyroid dysfunction.[7] In the study by Marimuthu K et al, out of 250 cases of AUB, 68 (27.2%) cases had thyroid dysfunction.[9] Jinger SK et al found 47% patients having thyroid dysfunction in their study and 53% euthyroid.[6]

The main thyroid dysfunction noted was hypothyroidism including subclinical (9%) and overt hypothyroidism (24%) in our study. Similarly, in the study by Marimuthu K et al 15.6% were hypothyroid, 3.2% had subclinical hypothyroidism and 7.2% were hyperthyroid.[9] Pahwa S et al observed in their study that 22% of cases were found to be hypothyroid, 2% hyperthyroid and 76% were euthyroid.

Sampath S et al had done their study on clinic-biochemical spectrum of hypothyroidism and found a mean age of 36.2 years among 944 women referred for thyroid testing. In this study, they found that the mean age of females with subclinical hypothyroidism was 5.4 years less than those with overt hypothyroidism.[10]

65% of cases of hypothyroid (both subclinical and overt) in our study, were exhibiting OLIGOMENORRHOEA. The similar results were seen in 57.13% patients in the study by Nair RV et al and in 46.15% patients in the study by Bharucha M et al.[11,12]

The main symptom in patients diagnosed to have hyperthyroidism was MENORRHAGIA (50%) in our study which was comparable to 63.6%patients in the study by Singh L et al.[13]

CONCLUSION

With the advent of modern hormonal assay techniques, precise estimation of thyroid hormone in serum is possible in a rapid and reliable manner. Hence investigating a patient with AUB, evaluation of thyroid function forms an essential component. AUB patients in the age group of 31-40 years mostly suffered from thyroid disorders and thus must be evaluated for it. This can avoid unnecessary hormonal treatment and surgical intervention.

REFERENCES

1. Hoffman B, Schorge J, Schaffer J, Halvorson L, Bradshaw K, Cunningham F. Abnormal uterine bleeding Williams Gynecology. 2nd ed. McGraw-Hill;2012:220, 234.

2. Dutta DC. Abnormal menstrual bleeding.Textbook of Gynaecology including contraception. 4th ed. New Central Book Agency(P) Ltd. 2005:177

3. Speroff L, Glass LH, Kass NG. Clinical gynecological endocrinology and infertility, 6th edn. Baltimore. Lippincott Williams ac Wilkins; 1999:201-238, 575-9.

4. Khan RL. Gynaecology: formerly known as by; Five Teachers Gynaecology, 3rd ed. CBS Publishers & Distributors Pvt. Ltd. 2009:255.

5. Pilli GS, Sethi B, Dhaded AV, Mathur PR, Dysfunctional uterine bleeding. J ObstetGynae India 2001;52(3):87-9.

6. Jinger SK, Verma A, Dayma I, Talreja T. To study the thyroid profile in menstrual disorder at tertiary care

hospital in northern western Rajasthan, India.Int J Res Med Sci. 2017 May;5(5):2212-4.

7. 8Pahwa S, Gupta S, Kumar J. Thyroid dysfunction in dysfunctional uterine bleeding. J Adv Res Bio Sci. 2013;5(1):78-3.

8. Deshmukh PV, Boricha BG, Pandey A. The association of thyroid disorders with abnormal uterine bleeding.Int J ReprodContracepObstet Gynecol. 2015;4(3):701-8.

9. Marimuthu K, Loganathan M. Influence of thyroid gland in women with abnormal uterine bleeding in reproductive age group. Int J ReprodContracepObstet Gynecol. 2017 June;6(6):2222-5.

10. Sampath S, Singh P, Somani BL, Arora MM, Batra HS et al. Study of clinicobiochemical spectrum of hypothyroidism. MJAFI. 2017;63(3):233-6.

11. Nair RV. Evaluation of Thyroid profile in patients with abnormal uterine bleeding.Int J Health Sci Res. 2015;15(9):94-8.

12. Menon UK, Barucha KE. Menstrual dysfunction and thyroid diseases.J ObstGynal India. 1995;45(4):521-6.

13. Singh L, Agarwal CG, Chowdhary SR, Mehra P, Khare R. thyroid profile in infertile women. J ObstetGynecol India. 1990;40:248.

A Case of Number of Severs Determination through Queuing Model Application in a Clinic of Udaipur

Dr. Ashish Adholiya
Assistant Professor (IT/ Marketing)
Pacific Business School, Udaipur (Rajasthan)

Dr. Shilpa Adholiya
Researcher and Data Analyst,
Freelancer, Udaipur (Raj.)

ABSTRACT

Waiting for own turn in a line is an exceptionally frenzied circumstance for everyone, especially in the case when someone is looking for medical treatment. Commonly it can be observed in general situation people are hanging tight in line for their turn for the service is become the part of their life, especially places such as shopping center, railway reservation counter, tourist leisure activity points, restaurants etc we have seen that the individuals spent a good percent of their valuable working hours. In pursuance to get the medical treatment if someone spent a certain time in the queue his/ her critical state may get worse, so it is very crucial to manage the waiting time in clinics, hospitals and any other medical unit. Waiting lines or queue is one of the critical challenges for the medicinal services everywhere throughout the globe especially in the countries with dense population. This study tests the use of waiting line model / queuing theory and displaying the waiting line issue at the outdoor patients at a selected clinic of Udaipur, Rajasthan. In this research work queuing model would be assessed to determine the number of serving points (medical staff) required according to the number of patients so that patient scan get prompt treatment. Number of doctors which recommend for offering clinical services at the selected clinic for better service and reducing the patient waiting time is 4 in its place of 3 doctors right now offering their specialty services at clinic.

Keywords: Waiting Line Model, Queuing Model, Medical Services, Outdoor Patients

INTRODUCTION

A typical and common occasion situation in the common peoples' regular daily life is waiting in a line or in a queue for particular service. A queue or waiting line is the result of difference between the demand and supply of the service. Time in a queue to get the service or a waiting line depends on several factors such as number of people in the queue, number of the servers, type of the service, proportion time for service etc.

Because of unmanaged or poor clinical services at any hospital or clinic, patients and their attendants experiences the lot of time delays to get treated[1-2]. Commonly it is also identified that long waiting lines are the result of absence of coordination, poor administration and inadequate management of resources etc, which influences the efficiency and efficacy of services in hospitals and clinics and resultantly affects patients' satisfaction[3]. For the particular research work the people are patients in the queue and number of patients, numbers of doctors, type of criticality of the patient, average time for the regular checkup of the patient and many more factors may influence the waiting time of a patient in waiting line or queue. If a patient is not satisfied with the hospital services, then it may affect the economic status of the hospital by not assuring the revisit of the patient and his/her positive word of mouth. So, just to improve the efficiency

of the service time in a clinic or a hospital OPD, waiting lines should be properly organized by the hospital administration. For this purpose in order to diminish the holding up time of patient in a line proper and accurate application of waiting line or queuing model can be performed. Queuing model is a mathematical study model of waiting lines so its application and utility in a clinic or hospital can give some fruitful results. Queuing theory helps to build a hypothetical model though which length of the waiting line or queue and waiting time can be anticipated in accurate way. The application of waiting line model or queuing theory has been used in health care units such as hospitals since year 1952.

But, even after that this one very effective predictive tool to get the approx idea about the use of number of servers, it is lamentably negligibly utilized in most medicinal services framework in world. Proper and accurate utilization and implementation of waiting line model or queuing model has been improving various administrative services in different hospitality areas especially in the medical clinic, or hospital backgrounds and also decreasing the undesirable expenditure by offering several servers (doctors) and other facilities. Long and unorganized waiting lines or crowd of the patients in waiting rooms of a hospital indicates the ineffectiveness and inefficacy of the hospital administration, and this can be identified very commonly in several hospitals and clinics in India. In order to maintain the aforementioned state of overcrowding the decisions of administration is based on their experience rather than on the basis of a strategic model based outputs. For the present research work a well known clinic of the Udaipur district of Rajasthan was chosen for the study purpose, which is a multi-specialty clinic and offer clinical and medical services gets various patients consistently and this for the most part brings about long patient waiting up times. In light of this test this research paper presents the queuing model arrangement for the OPD patients of selected clinic so as to build up a model that can help lessen the waiting time of patients. One of the significant factors in order to improve the productivity in the delivery of medical and health care services is the flow of patients and discharging them with great extent of satisfaction, especially in OPD managing their delays to get treatment. Great patient flow implies that patient queue of waiting line is less and poor patient flow implies that patients endure from waiting line delays and other time mismanagement. So, in totality waiting line model and theory can be valuable tool for the hospital administrators in now days for improving their basic decision making instances pertaining to capacity, servers and resourcing.

RESEARCH METHODOLOGY

The nature of the research work is observational and diagnostic, means study will describe the use of the waiting line model in the hostel and its mathematical analysis, and diagnoses the significance of the best suitable form of waiting line model for the selected clinic of Udaipur. Primary data and required information for the analysis purpose were gathered with in the period of 45 days, and the major time to collect the data was spent in the waiting rooms and lobbies of OPD department of clinic. Primary and essential data was accumulated from the direct contact with the respondents and the observations, direct meetings with the administrative heads of the clinic, doctors, nursing staff and managerial staff. All the other secondary information was collected through the appointment records and by posing questions to the patients and other visitors.

The research method deployed for the present research work was to assess the efficiency and efficacy of queuing systems or waiting line model and practices, inclusive of the advancement of queuing or waiting line model for the investigating the queuing method as a effective method of solving the problem of patient waiting time for treatment or other medicinal services. The model will help to find that the genuine time it takes to serve the patient through estimating the actually required serving/ treatment points (doctors) in the clinic according to the flow of patients. The model created was utilized to investigation the waiting line or queuing model against the number of servers and patients rate of arrival within the clinic for the treatment. Moreover, in the wake of looking at the issue systematically and applying the waiting line or queuing model, the corrective measures can be proposed to improve the delay and make the OPD increasingly productive to improve the rate of patient satisfaction too.

DATA ANALYSIS AND RESULT DISCUSSION

The (Multi Server) MMS waiting line / queuing model first in first out is used in the present research work for estimating the accurate and effective number of serving points in the clinic for proper management of the waiting time of patients. In waiting line or queuing framework inflow of the visitors for particular this research work patients pursues Poisson probability to estimate the average patients within per unit of time frame. The model likewise follows the first in first out serving model for all the serving units (doctors, care units, specialists etc.) at clinic. The time for treatment or medicinal service are disseminated exponentially according to the number of average patients per unit of time and the servers' numeric count.

Table 1: Patient(s) Arrival in the Clinic (Month November 2019)

Day	1	2	3	4	5	6	7	8
N	140	89	96	132	92	96	101	85
Day	9	10	11	12	13	14	15	16
N	132	112	106	110	94	90	96	87
Day	17	18	19	20	21	22	23	24
N	136	108	115	99	97	106	103	114
Day	25	26	27	28	29	30	-	-
N	124	123	112	84	97	103		

Source: Appointment Book Register of Hospital

From the data given in Table 1 related to Patient(s) Arrival in the Clinic (Month November 2019) it could interpret that the total patients visited to the clinic within the period of 30 days of month November 2019 are 3179. Consequently, the average rate of patients coming to the clinic on per day basis would be 3179/30=105.97 ≈ 106 patients on per day basis and on the basis of total visiting hours of the doctors i.e. 180 hrs, per hour = 17.66 ≈ 18 patients are visiting to the clinic for medicinal services or treatment. From the personal observation and on the basis of doctors response on an average in order to check the patient properly and suggest him the care or treatment an amount of 7-10 minutes is required as in the clinic total care is the primary aim and doctor himself is responsible to noting down some basic details of patients such as blood pressure, weight, etc. This implies that within the period of 60 minutes/1 hour a doctor can offer the treatment to 9 patients. In this one hour service rate of a doctor some other breaks such as checking of reports of already visited patients, attending the patients revisited with some confusion in the mind, other calls from the medical staff of clinic etc. So, in totality an average

(μ) of 7 new patients can consult the doctor within the period of 60 minutes/ 1 hour. In the selected clinic of the study, 3 specialty doctors offer their consulting services in OPD. Doctors' visiting hours incorporates both the morning and evening visiting hours. So, on approx 6 hours in a day 3 specialty doctors offer their consulting services at the clinic, excluding their other hours which they spend in clinic for other medicinal services.

On the basis of MMS (Multi Server) queuing equations some key values such as arrival rate of patients at per unit of time (λ), average rate of service per unit (μ), total number of doctors, probability of zero patients in the queue or waiting line (P_0), number of expected patients in the queue (L_q), number of expected patients in the total medicinal system (L_s), expected time spent by the patient in the queue for medicinal system service/ treatment (W_q), and expected time spent by the patient in the medicinal system of clinic for service/ treatment (W_s) will be calculated mathematically for the 3 serving points (doctors). So, calculations are as below:

λ	μ	**Utilization factor (ρ) = λ / μ**
18	7	18/7 = 2.571 >1

Table 2 presented below showed the mathematical calculation of MMS Queuing System for different number of Servers (Doctors) i.e. 3, 4, 5, and 6 for offering the medicinal services to the patients visiting the clinic.

Table 2: Calculation of MMS Queuing System for different number of Servers (Doctors)

Case	Number of Servers S	Arrival rate (λ)	Service rate (μ)	Probability of No Patient in Queue (Po)	Average Number of Patients in the Queue (Lq)	Average Number Patients in the System (Ls)	Average Time in the Queue (Wq)	Average time in the System (Ws)	System Utilization (ρ)
1	3	18	7	3.743%	4.455	7.027	0.248	0.390	85.714%
2	4	18	7	6.751%	0.620	3.191	0.034	0.177	64.286%
3	5	18	7	7.428%	0.152	2.723	0.008	0.151	51.429%
4	6	18	7	7.591%	0.040	2.611	0.002	0.145	42.857%

Source: Primary Data

From the mathematical calculation outputs presented in the tabular form above revealed that for case 1 where number of servers were 3 server utilization ratio is quite good i.e. 85.714% with 18 patients arrival rate and 7 patients average service offering at per unit of time hour and 64.286% utilization ratio was observed in case 2 with 4 doctors, for this case utilization rate is near about 65% and confirming the lesser time spent by the patient in the queue in comparison to the 3 server (doctors). Among the entire cases highest utilization ration is observed for 3 doctors as the servers. So, from the statistics presented in the above table it could interpret that waiting time in queue accordingly decreases when number of sever (doctors) is increased. But, for case 1 with 3 servers average waiting time in the queue by the patient is $W_q= 0.248$ hour and average time spend by the patient in the clinic W_q is 0.390, which can be reduced to a certain extent if number of sever increased to 4 as presented in case 2 average waiting time in the queue by the patient W_q would be reduced to 0.034 hour and average time spend by the patient in the clinic W_q would be reduced to 0.177. So, it is recommend that the number of doctors which can be occupied for offering clinical services at the selected clinic for better service and reducing the patient waiting time would be 4. Availing the services from the higher number doctors to reduce or manage the waiting time more specifically would not be cost effective for the selected clinic according to the number of patients visited the clinic on monthly basis.

CONCLUSION

Offering the proper medicinal services to the patients without higher service delays or waiting time or giving the treatment within the certain time frame is a significant factor of any of the hospital and clinic or any other human services organization to improve the visitor satisfaction and to ensure their visits again. Patients and their attendants become disappointed especially with the long waiting time frame and it result into the negative impact on patients and ultimately leads into dissatisfaction or bad word of mouth for the clinic or hospital. So, the present research work confirms that waiting line or queuing model is a viable methodology that can be used to make the right decision over the certain situation on the basis of mathematical outputs for good and effective performance with respect to waiting time problem in the clinics and hospitals. This research work would be useful to understand the usefulness of queuing model in making the decision about number of server determination decision in the hospital and clinic in India in regards to improving the basic leadership with respect to the waiting time difficulties that are looked by medical clinics and hospitals.

REFERENCES

1. Dellaert N., Cayiroglu E., and Jeunet J. (2015). "Assessing and controlling the impact of hospital capacity planning on the waiting time," International Journal Prod., Vol. 54, No. 8, Pp. 2203–14.

2. Lohlun K.N., Kotzen J.A., and Lakier R. (2015). "A prospective study on the impact of waiting times for radiotherapy for cervical cancer at Charlotte Maxeke Johannesburg Academic Hospital," South African Journal of Obstetrics and Ggynaecology, Vol. 21, No. 1, Pp. 6.

3. Basta Y.L., Tytgat K.M., Klinkenbijl J.H., Fockens P., and Smets E.M. (2016), "Waiting time at a fast-track diagnostic clinic," International Journal Health Care Quality Assurance, Vol. 29, No. 5, Pp. 523–535.

Clinicopathological Study of Sinonasal Masses in Tribal Areas

Dr. P.C. Jain

Professor, Deptt of ENT, Pacific Medical College And Hospital, Bhillo Ka Bedla, Udaipur (Rajasthan)

Dr. Richa Gupta

Associate Professor, Deptt of ENT, Pacific Medical College And Hospital, Bhillo Ka Bedla, Udaipur (Rajasthan)

Dr. Ravi Kumar

Senior Resident, Deptt of ENT, Pacific Medical College And Hospital, Bhillo Ka Bedla, Udaipur (Rajasthan)

ABSTRACT

Background: Nasal cavity and paranasal sinuses are site for variety of mass lesions presenting as polyp or neoplastic lesion. The present study was done on patients presenting to ENT OPD, Pacific medical college and hospital, Udaipur (Rajasthan) January 2018 to December 2019. Inflammatory lesions were more common in comparison to neoplastic lesions with antrochaoanal polyp being most common variety among inflammatory lesion, nasopharyngeal angiofibroma in benign lesions and squamous cell carcinoma in malignant lesions.

Keywords : Carcinoma, Paranasal Sinus, Polyp, Sinonasal Mass

INTRODUCTION

The mass in nasal cavity is a common finding in patients presenting to ENT setups. This can present either in the form of polyp or benign and malignant lesion. The nasal cavity and paranasal sinuses (PNS) form a single functional unit with common pathological process affecting both, most of which are inflammatory. The respiratory mucosa being exposed to range of infections, chemical irritants, mechanical and traumatic influences leads to formation of nasal polyps. This inturn leads to prolonged oedema of mucosa and submucosa of nose and paranasal sinuses. The prevalence rate of nasal polyp is about 2 %[1].

Neoplasms affecting the PNS and nasal cavities are rare in comparison with sinonasal inflammatory disease but benign neoplasia of the nose and PNS is relatively not uncommon[2]

The presenting features and symptomatology of all sinonasal masses are similar, i.e., nasal obstruction, rhinorrhea, blood stained nasal discharge, epistaxis, oral symptoms, facial swelling, orbital symptoms, ear symptoms, etc.[3]

The sinonasal malignancies mimic polyp in symptoms and can remain silent for months to years and this leads to delay in diagnosis of tumours and can prove dangerous for patient if not intervened timely.

AIMS AND OBJECTIVES

The present study was done with the aim of studying the incidence of sinonasal masses (SNM) and histopathologically diagnose variety of masses.

Material and Methods

The present study was carried out on patients who presented to ENT OPD, Pacific Medical College and Hospital, Udaipur. Sixty five patients were selected for present study. Thorough clinical history with meticulous clinical examination was done along with appropriate investigations. Clinical examination included complete ear nose throat along with anterior and posterior rhinoscopy. The routine laboratory examination was done along with radiological examination like X Ray PNS (Water' s view), X Ray nasopharynx (Lateral view), CT Scan of nose and paranasal sinuses wherever necessary and nasal endoscopy

using 0 degree and 30 degree nasal endocscopes to visualize the condition of sinuses. The provisional diagnosis was made after clinical examination and radiological investigations but final diagnosis was made after histopathology of soft tissue sent for biopsy.

After identification, nasal mass was removed and was sent for histopathological examination.

RESULTS

The male predominance was seen with male contributing to 41 (63.07 %) and female contributing to 24 (36.93 %) with overall male to female ratio of 1.7. As per the age distribution most of the patients belong to 21-30 year age group 18 (27.7 %), 12 (18.4 %) belong to 31-40 year age group, 10 (15.35 %) belong to 41-50 year, 9 (13.84 %) belong to 51-60 year, 3 belong to 61 year and above. The patients belonging to 0-10 year age group 3 (4.61%) and 11-20 year age group were 10 (15.38 %) . The maximum cases 53 (81.54 %) were diagnosed with inflammatory lesions while 12 (18.46 %) were diagnosed with neoplastic lesion. Among 12 neoplastic lesions the benign lesion was seen in 4 (33.34 %) cases and malignant lesion in 8 (66.67 %) cases.

As per the number of masses, the sinonasal mass was found to be multiple in 16 cases (24.62 %) while 49 (75.38 %) were single in number.

As per laterality the unilateral mass were more common 48 (73.84 %) as compared to bilateral 17 (26.16 %). Left side 28 (58.33 %) was found to be more common than right side 20 (41.67 %).

Maximum cases presented with nasal blockadge in 62 cases , rhinnorhoea in 54 cases, headache in 45 cases, sneezing in 20 cases, epistaxis in 10 cases, change in sense of smell in 8 cases, ear findings in 18 cases.

Maximum incidence among inflammatory lesion was found to be of antrochoanal polyp 27 (50.9 %) (Fig 1,2), ethmoidal polyp 15 (28.3 %), angiomatous polyp in 6 (11.32 %), rhinosporidiosis 2 (3.78 %), rhinolith in 2 cases (3.78 %) and rhinoscleroma in 1 case (1.89 %).

Among neoplastic lesions, benign lesion was nasopharyngeal angiofibroma 2 cases (16.67 %), inverted papilloma in 2 cases (16.67 %). Among malignant lesion squamous cell carcinoma was seen in 5 cases (62.5 %) and adenocarcinoma in 2 cases (25 %) and undifferentiated carcinoma 1 cases (12.5 %).

Figure 1 Nasal Endoscopic View
of Antrochoanal Polyp

Figure 2 CT Scan Coronal Section Left Side Polyp.

DISCUSSION

The predominance of males was observed in our study similar to previous studies[4]

Most common age group was 21-30 year with neoplastic lesions most commonly seen in 41-50 year age group which is in accordance with studies done in past[5]. In other studies[6] it was found to be most common in 11-20 year age group.

The incidence of inflammatory lesion was more compared to neoplastic lesions. This was higher in comparison to other studies[4]

Non-neoplastic inflammatory polyps were usually unilateral and single, while allergic polyps were usually bilateral and multiple in agreement with the analysis of Frosini et al.[7]

In previous studies examination revealed bilateral SNM in 44.4 % and unilateral in 55.3 % out of which 31.6 % were found on the right side and 23.6 % on left nasal cavity[8]

The most common complaint was nasal obstruction which was similar finding as past studies[9]

As per previous studies (10) the most common benign SNM as the nasal polyp; 51.7 % of the cases revealed ethmoid polyp and 20.4 % revealed an antrochoanal polyp with second most common SNM as nasopharyngeal angiofibroma 18 cases (12.24 % cases), schneiderian papilloma 5 cases (4 cases were of inverted papilloma and one rare case that was an everted papilloma). 3 cases of rhinosporidiosis and 4 cases of rhinoscleroma were encountered.

The clinico-histopathological correlation in our case study was 98 %. A past study revealed 1.1% of patients with histopathologic findings different from their clinical diagnosis and led to alteration in management (10). In another study a difference of 0.3 % was found between histopathology and radiologicl and clinical findings and examination[11].

The histopathological examination still remains the gold standard for confirming and refuting the diagnosis. Thus, a detailed history, clinical examination, proper imaging, and most importantly thorough histopathologic evaluation are essential part of work up of patients, so that, a required and timely intervention is done.[4]

CONCLUSION

The similarity in initial presentation of non neoplatic and neoplastic masses can lead to delay in diagnosis of certain tumours. Proper clinical diagnosis, radiological investigations and histopathological examination together remains the key for confirmatory diagnosis for better outcome in future.

REFERENCES

1. Settipane GA (1987) Nasal polyps: pathology, immunology, and treatment. Am J Rhinol 1:119–126

2. Laren PL, Tos M (1994) Anatomic site of origin of nasal polyps: endoscopic nasal and paranasal sinus surgery as a screening method for nasal polyps in autopsy material. Rhinology 33:185–188

3. Somani S, Kamble P, Khadkear S. Mischievous presentation of nasal masses in rural areas. Asian J Ear Nose Throat 2004;2:9-17

4. Khan N, Zafar U et al. Masses of nasal cavity , paranasal sinuses and nasopharynx: A clinicopathological study. Indian journal of otolaryngology and head and neck surgery, Vol 58, No 3, July- Sep 2006

5. Tandon DA, Gairola A et al . Clinical ,radiological and surgical correlation in cancers of paranasal sinuses. Indian journal of otolaryngology and head and neck surgery. Vol 49 No. 1, March 1997.

6. Swamy KVC, Gowda BVC. A Clinical study of benign tumours of nose and paranasal sinuses. Indian journal of otolaryngology and head and neck surgery.Vol 56, No. 4 , Oct-Dec 2004.

7. Frosini P, Picarella G, Campora E (2009) Antrochoanal polyp: analysis of 200 cases. Acta Otorhinolaryngol Ital 29:21–26

8. Bakari A, Afolabi OA, Adoga AA, Kodiya AM (2010) Clinicopathological profile of sinonasal masses: an experience in national ear center Koduna, Nigeria. BMC Res Notes 3:186

9. Newton JR, Ah-See KW (2008) A review of nasal polyposis. Ther Clin Risk Manag 4(2):507–512

10. Diamantopoulos II, Jones NS, Lowe J. All nasal polyps need histological examination: An audit−based appraisal of clinical practice. J Laryngol Otol 2000;114:755−9.

11. Garavello W, Gaini RM. Histopathology of routine nasal polypectomy specimens: A review of 2,147 cases. Laryngoscope 2005;115:1866−8.

Dyke – Davidoff – Masson Syndrome

Dr. Suresh Kumar Mehta
Prof. and HOD.,Dept. of Psychiatry,
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Neeraj Kumar Tripathi
Clinical Psychologist and Counseller,
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Pinki Trivedi
Clinical Psychologist and Counsellor
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. S. K. Sharma
Consultant Psychiatrist,
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

INTRODUCTION

There are a variety of causes that lead to cerebral hemi atrophy with resultant complications like poor physical growth , hormonal abnormalities , intellectual insufficiencies, seizures , hemiplegia etc. [1-4] Dyke,Davidoff and Masson published a series of nine cases in 1933 presenting with hemi paresis , seizures , facial asymmetry. This condition is called as Dyke-Davidoff-Masson Syndrome.(DDMS).[6] Brain insult from a variety of causes from foetal stage to early infancy can result in cerebral hemi atrophy. The causes are either congenital, idiopathic (Primary) and intrauterine vascular injury or acquired, i.e. perinatal intracranial hemorrhage, infection (Encephalitis), trauma, vascular abnormalities (Sturge-Weber's Syndrome), ischemia, hypoxia, etc. Magnetic Resonance Imaging (MRI) reveals changes in the brain parenchyma with thinning of grey matter, reduced volume of white matter, enlarged lateral ventricle, reduced size of cerebellar hemisphere.

We report a case of recurring seizures in a young 18 year-old female who presented to psychiatry outpatient in a tertiary care hospital and was diagnosed with cerebral asymmetry that could be traced to a cerebral insult in infancy.

CASE PRESENTATION

A 18-year-old female was brought to the Psychiatric OPD by her father with the complaint of behavioral problems, recurring seizures, and weakness of right upper and lower limbs, Detailed history revealed that the patient was born at full term through vaginal delivery without any trauma/birth asphyxia. Birth weight recorded was 2100g. At 5 months of age, the child suffered high-grade fever, had convulsions, and was admitted to the hospital for a month. She was suspected to be a case of Encephalitis. Although the child recovered from fever and febrile convulsions, the milestones were delayed and speech was affected. Later, an IQ assessment showed moderate mental retardation (IQ 30-49). As she grew up, seizures returned at regular intervals and she was put on anticonvulsants by the neurophysician. She started showing behavioral changes in 2013 (at 13 years of age) in the form of irritability, violence and withdrawn behaviour with not doing any household work while on anticonvulsants Tab Oxcarbazepine 150 mg two times a day. She was put on low doses of atypical antipsychotic tab. Risperidone 1 mg once a day and small dose of benzodiazepine (Clonazepam 0.25 mg/day) and multivitamins. Behaviour therapy and counselling of family members helped in better outcome of the case. She remained symptom free. Frequency of seizures reduced considerably to once in 5 to 6 months. General physical examination was normal. Her gait was hemi paretic type with motor power grade III in right upper and lower limbs.

All hematological and hormonal (T3, T4, TSH, FSH, LH) investigations revealed no abnormality. NCCT brain done on 08/08/2019 revealed no thickened skull vault with thickened diploic spaces. Mild prominence of the sylvian fissure and sulcal spaces on the

left side indicated atrophy of the brain. Mild prominence of left lateral ventricular system was noted. Midline structures were maintained. Cerebellum and brain appeared normal (Figure 1).

C.T. Brain Images of the Patient:
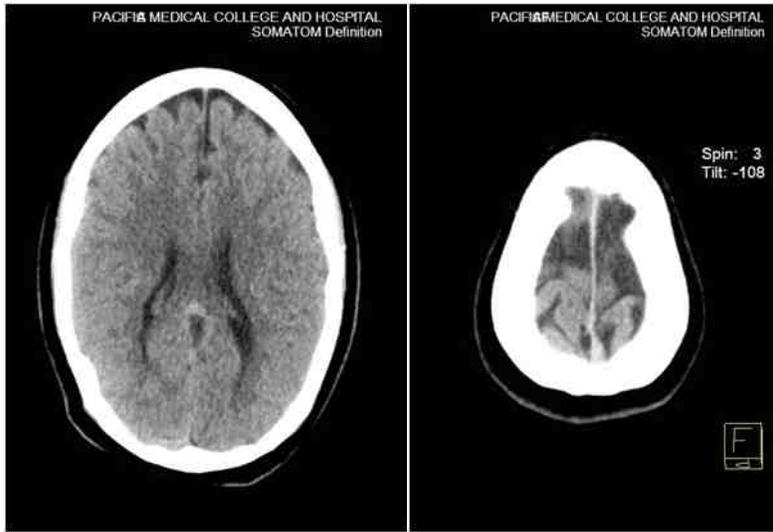

Figure – 1


Figure – 2
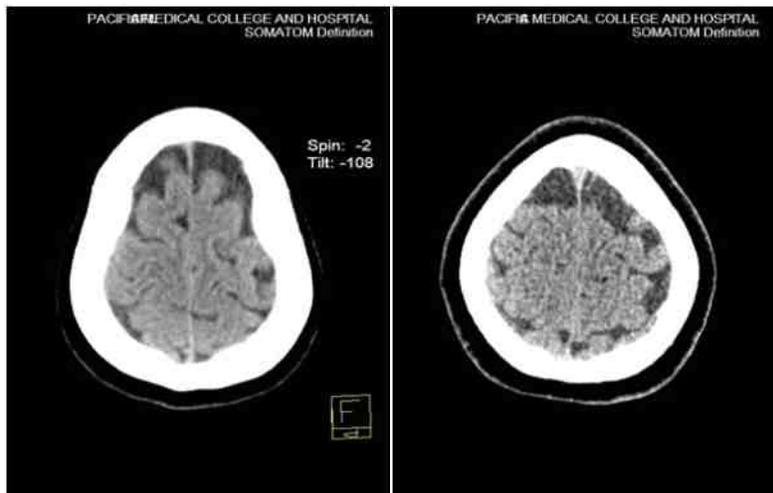
Figure – 3
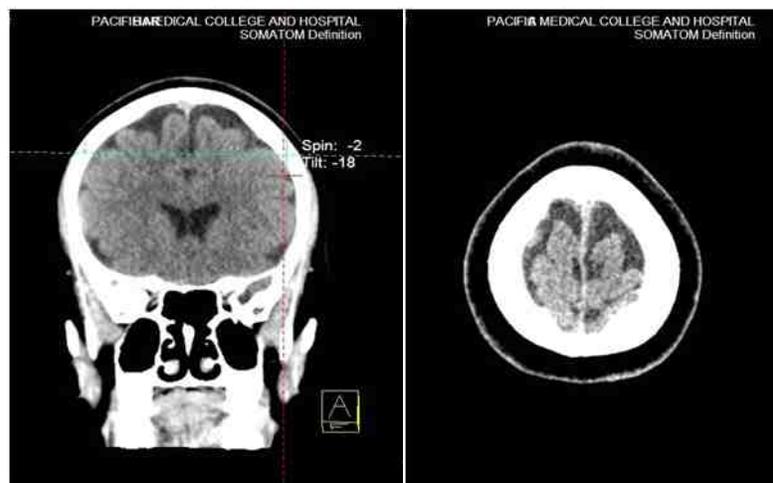
Figure – 4

Figure – 5

Figure – 6

DISCUSSION

From the foregoing, it is apparent that the patient suffered a febrile illness, which was labeled as Encephalitis at a very vulnerable age of 5 months and affected the growth of the brain. The NCCT Brain findings (figure 1 to 3) of temporal and frontal lobe atrophy together with seizures and mentally challenged state resembled the condition described by Dyke, Davidoff, and Masson's series of 9 cases in 1933. The appearance in these cases showed thickening of calvarium, dilatation of frontal, and ethmoid sinuses, and elevation of greater wing of sphenoid and petrous ridge. The CT Brain findings in the above case almost conform to this condition. It is a fact that the brain grows to half of its adult size by the first year and reaches 75% of the adult size by three years. Any insult during these years will result in stunted growth of the brain and the skull vault grows inwards resulting in thickening of the vault, enlargement of frontal sinuses and increases width of diploic spaces and greater wing of sphenoid and petrous ridge on the affected side. This is possible when the brain damage is sustained in the first few months of infancy, as in this case. This shows that DDMS although not a very common condition, it can present in varying degree of severity. What is important is to document a proper clinical history, a detailed clinical examination and investigations (CT, MRI, and Hormonal) to confirm the diagnosis of DDMS. Cerebral insult very early in infancy due to febrile illness (Encephalitis) seems likely to be the cause in this case.

CONCLUSION

Dyke-Davidoff Masson Syndrome is a rare condition resulting from brain injury in early age due to a multitude of causes. Characteristics include cerebral hemiatropy/ hypoplasia, contralateral hemi paresis, seizures and compensatory osseous hypertrophy.

This 18 yrs female presented with right sided weakness , recurring seizures , poor intellectual functioning and behavioural problems. History of the Encephalitis at the age of 5 months led to development of above presentation. Milestones were delayed and the IQ was between 30 to 45.

Proper detailed history and relevant investigations , with suspicion of the DDMS   diagnosis helped in confirming the diagnosis .Prognosis of the case remained guarded.

Declaration of the Patient Consent:

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient and relatives understand that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be assured .

Conflicts of Interest :

There are no conflicts of interest.

REFERENCES

1. Alpers BJ, Dear RB. Hemiatrophy of the brain. J NervMent Dis 1939; 89:653-651.

2. Zilkha A. CT of cerebral hemiatrophy. AJR AmjRoentgenol 1980;135:259-62.

3. Hagema G, Gooskens RH, Willemse J. A cerebral hypoplasia. ClinNeurolNeurosurg 1985;87:119-22.

4. Dyke Davidoff Masson Syndrome : A Case Report :Anna Misyail Abdul Rashid,MohamadSyafeeqFaeez Md. Noh , BMC Neurology 18 , Article No. 76 (2018)

5. Solomon GE, Hilal SK, Gold AP, Carter S. Natural history of acute hemiplegia of childhood. Brain 1970;93:107-20.

6. Dyke CG, Davidoff LM, Masson LB. Cerebral hemi atrophy with homolateral hypertrophy of skull and sinus. SurgGynecolObstet 1933;57:588-600.

7. Cerebral Hemiatrophy as a consequence of cerebral insult in infancy : Is it difficult to diagnose ? Daniel Saldanha , BhushanChoudhari , Sureshkumar Mehta , ArchanaJavadekar , AmitKharat –Industrial Psychiatry Journal-Jan-Jun 2014/Vol.23 /Issue 1

8. Parker CE, Harris N, Mavalwala J. Dyke-Davidoff-Masson syndrome. Five case studies and deductions from dermatoglyphics. ClinPediatr (Phila) 1972;11:288-92.

9. Goyal, V Shah, S Rao, N Jindal. Dyke Davidoff Masson syndrome in children. The internet Journal of Pediatrics and Neonatology. 2009;10:101-107.

10. Sharma S. Goyal D, Negi A, Sood RG, Jhobta A, Surya M. Dyke-Davidoff Masson syndrome. Indian J Radiol Imaging 2006;16:165-6.

Pleomorphic Carcinoma - A Rare Variant of Invasive Breast Carcinoma

Dr. Rashmi Monteiro
Department of Pathology
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Shashi Sujanani
Department of Pathology
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Preeti Agarwal
Department of Pathology
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

ABSTRACT

Pleomorphic breast carcinoma is a rare variant of high-grade invasive ductal breast carcinoma of no special type. We present a case of a 50 years old female who came with complaints of swelling in right breast since 1-month which was associated with pain. Radiological findings suggested BIRADS gradeV. Fine needle aspiration of the swelling in breast was done. The smears were stained with Giemsa and were examined. The diagnosis on fine needle aspiration cytology was given as 'Malignant carcinoma of right breast'. Modified radical mastectomy was performed and after the routine tissue processing, Hematoxylin and Eosin stained slides were prepared. Morphological diagnosis of Pleomorphic carcinoma-Invasive ductal carcinoma of no special type was made and the diagnosis was confirmed by immunohisto-chemistry. It is important to recognize this tumor since this entity has been reported to have a poor prognosis and tumor size greater than 5 cm are associated with markedly decreased overall survival.

Keywords: Pleomorphic Carcinoma, Breast, Immunohistochemistry

INTRODUCTION

The recent World Health Organization (WHO) classification of breast tumors, includes a rare variant of high-grade invasive breast carcinoma of no special type (NST) called 'Pleomorphic Carcinoma'. Pleomorphic carcinoma is characterized by "proliferation of pleomorphic andbizarre tumor giant cells comprising >50% of the tumor cells in a background of adenocarcinoma or adenocarcinoma with spindle and squamous differentiation"[1]. The two main features are pleomorphism and increased mitotic activity[2]. Due to its unusual morphological features, pleomorphic carcinoma is confused & misdiagnosed as sarcoma and therefore immunohistochemical markers are used for differentiation[3]. 84 cases of pleomorphic carcinoma of breast have been reported in English literature[2].

Herein, we report a rare case of pleomorphic carcinoma of breast in a 50 years female.

CASE REPORT

A 50 years old female, housewife, visited the surgery OPD in a tertiary care hospital in southern Rajasthan, with complaints of swelling in right breast since 1 month. It gradually increased in size and was associated with pain. She also complained of loss of appetite and weight loss. She had no past history of malignancy. There was no family history of breast carcinoma. Physical examination revealed a hard, fixed and painful mass in the lower outer quadrant of the right breast. Nipple inversion was noted but there was no nipple discharge. No abnormalities were noted in the left breast and no lymph nodes were palpable in bilateral axillary region. Ultrasonography of right breast revealed a large lobulated hypoechoic mass measuring 88 x 70 mm, with internal necrotic areas involving the lower outer quadrant of the right breast. This represented a malignant mass in the right breast

and was graded as BIRADS-V. Fine needle aspiration was done and the Giemsa stained smears studied were highly cellular and composed of dyscohesive ductal epithelial cells arranged insheets, few branching papillae and dispersed singly. The cells were pleomorphic, showing nucleomegaly, round to oval hyperchromatic nuclei, irregular chromatin, prominent nucleoli with moderate amount of cytoplasm. Many bizarre cells and multinucleated giant cells were also noted in a hemorrhagic background. Impression given was 'Malignant Carcinoma-Right Breast' (Figure 1).
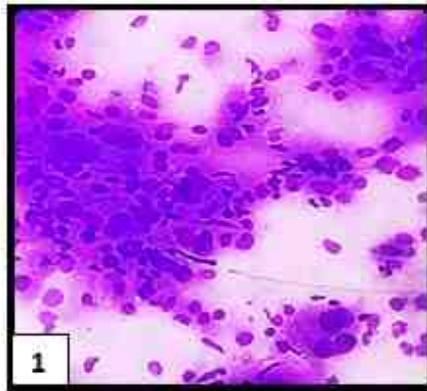

Figure 1: Dyscohesivepleomorphic Ductal Epithelial Cells
Arranged in Sheets, Many Giant Cells And Bizzare Cells Noted, Giemsa 400x

The patient underwent modified radical mastectomy (MRM). Post-operative period was uneventful. The MRM specimen was sent for histopathological examination.

On gross examination (Figure2), the MRM specimen measured 15 x 12 x 7cm. The elliptical skin flap with nipple areolar complex (NAC) measured 12 x 6 cm. NAC was unremarkable. Serial sectioning showed a mass measuring 9 x 7 x 5 cm. Cut surface of the mass was grey white andvariegated. All surgical margins were free of tumor. 8 lymphnodes were identified from the axillary region, largest measured 1.5 cm in greatest diameter and smallest measured 0.5 cm in greatest diameter. Cut surface of all were grey white.

Figure 2: Mass Measuring 9x7x5cm,
Cut Surface is Grey White & Variegated

Routine tissue processing was done and Hematoxylin and Eosin (H&E) stained slides were prepared. Multiple sections examined microscopically showed a tumor with cells arranged in sheets(Figure 3). The cells were pleomorphic with large nuclei, prominent nucleoli and showed abundant eosinophilic cytoplasm. Many pleomorphic tumor giant cells with bizzare nuclei were noted. Increased mitotic activity, areas of necrosis and vascular tumor emboli was seen. All the margins and NAC were free of tumor. 3 lymphnodes showed metastasis. The impression given was 'Pleomorphic variant-Invasive Carcinoma of No Special Type -Right breast', Modified Bloom Richardson score: 3+3+3 = 9; Grade 3.The diagnosis was confirmed with immunohistochemical markers ER, PR, Her2neu, CK-7 and Pan-CK (Figure 4). ER was positive with Allred score 2+2=4. CK-7 and Pan-CK were positive. PR and Her2neu were negative.
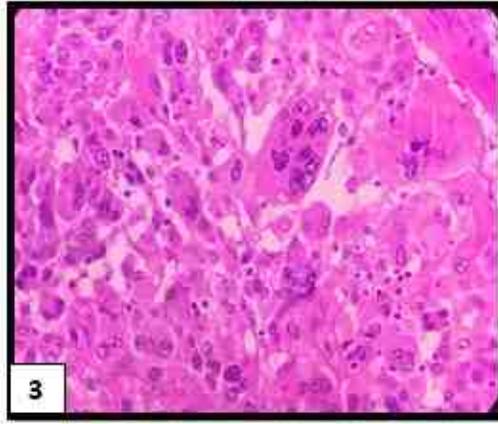
Figure 3: Tumor Arranged in Sheets, Cells are Pleomorphic with Round to Oval Nuclei, Prominent Leomorphic Giant Tumor Cells with Bizarre and Multinucleated Nuclei H
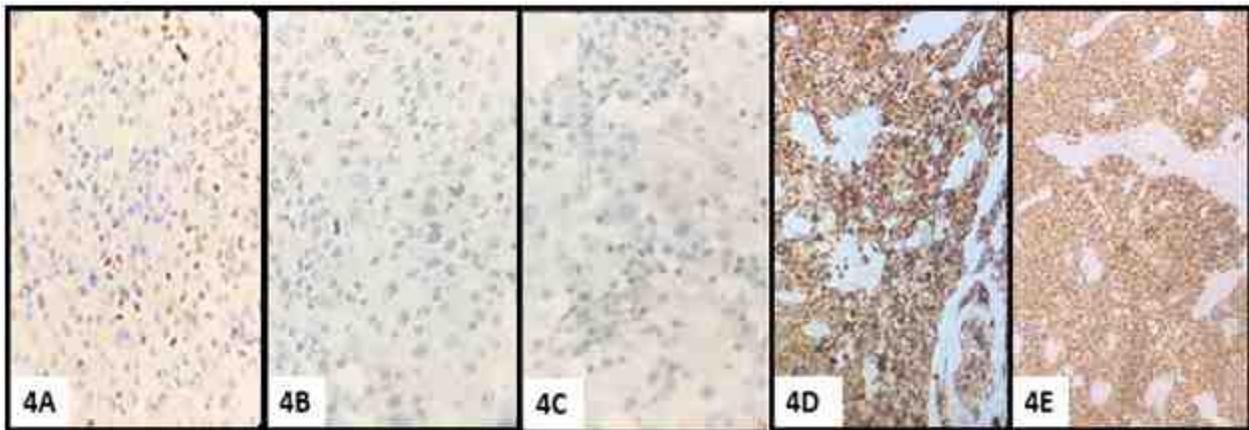

Figure 4A: ER Positive (IHC,400x); **Figure 4B:** PR Negative (IHC,400x); **Figure 4C:** Her2neu Negative (IHC,400x); **Figure 4D:** CK-7 Positive (IHC,100x); **Figure 4E:** Pan-CK Positive (IHC,100x)

DISCUSSION

Breast cancer is the commonest cancer worldwide affecting females with a high mortality rate[2,4]. The recent WHO classification of breast has described a new entity of pleomorphic carcinoma. Pleomorphic carcinoma has distinctive morphological features characterized by "Proliferation of pleomorphic and bizarre tumor giant cells comprising >50% of the tumor cells in a background of adenocarcinoma or adenocarcinoma with spindle and squamous differentiation"[1]. Silver SA and Tavassoli FA were the first to describe & report pleomorphic carcinoma and believed it to represent grade III, invasive ductal carcinoma[5]. Pleomorphic variant is a rare variant of high grade invasive carcinoma no special type[1]. This variant is known to have poor prognosis, but not all cases behave poorly. Poor prognosis of the tumor is associated with spindle cell metaplastic component and tumor size >5 cm in stages I-III disease[2].

Radiological findings of pleomorphic carcinoma may be confused with other benign breast lesions, inflammation, fibroadenoma and malignant phyllodes tumor. Therefore pathological examination plays a vital role in diagnosing pleomorphic carcinoma[6].

Microscopic features of pleomorphic carcinoma are similar to other breast tumors- invasive carcinoma with osteoclast-like giant cells, invasive pleomorphic lobular carcinoma, invasive carcinoma with chorioepithelioma features, mammary sarcoma with giant cells, and metastatic tumors can present pleomorphic tumor cells[7]. Invasive carcinoma with osteoclast-like giant cells is CK negative while CD68 is positive. Pleomorphic lobular carcinoma show cells with pleomorphic, hyperchromatic, irregular nuclei and which tend to arrange in a linear pattern. Immunohistochemistry study for E-Cadherin is negative as compared to pleomorphic invasive breast carcinoma in which it is positive. Invasive carcinoma with chorioepithelioma features shows positive expression of β-HCG. Mammary sarcomas can be differentiated with CK. Metastatic carcinomas usually are rare and are multicentric, while patients mostly has a history of another primary tumor.Pleomorphic variant of invasive carcinoma no special type shows positivity for CK and E-Cadherin which differentiates it from invasive carcinoma with osteoclast-like giant cells, pleomorphic lobular carcinoma and breast sarcomas. While it is negative for β-HCG which distinguishes it from invasive carcinoma with chorioepithelioma features[2,8,9].

CONCLUSION

It is important to recognize this entity to avoid catastrophe due to its unfavorable prognosis. Although pleomorphic variant of

invasive breast carcinoma is a rare variant and has a poor prognosis, timely diagnosis through pathological examination and immunohistochemistry studycan differentiate it from other similar tumors and may be associated with better prognosis and increased rate of survival.

Conflicts of Interest: Nil

REFERENCES

1. Ellis IO, Collins L, Ichihara S and MacGrogan G. Invasive carcinoma of no special type. In: Lakhani SR, Ellis IO, Schnitt SJ, Tan PH and van de Vijver MJ. WHO Classification of Tumors of the Breast. 4th edition. Lyon: IARC Press; 2012. pp. 34-38.

2. Moghimi M, Aryanfar A, Kargar S, Joukar F. Pleomorphic Ductal Carcinoma of Breast: Two Cases and Review Literature. ActaMedicaIranica. 2019 Mar 1;57(3):200-4.

3. Córdoba A, Del Rosario Mercado M, Vicente F, Ederra M, Torrea N, Guerrero-Setas D. Pleomorphic carcinoma of the breast with expression of macrophage markers: Report of two cases. PatholInt 2012;62:491-5.

4. Malvia S, Bagadi SA, Dubey US, Saxena S. Epidemiology of breast cancer in Indian women. Asia‐Pacific Journal of Clinical Oncology. 2017 Aug;13(4):289-95.

5. Silver SA and Tavassoli FA. Pleomorphic carcinoma of the breast: clinicopathological analysis of 26 cases of an unusual high-grade phenotype of ductal carcinoma. Histopathology 2000; 36: 505-514.

6. Zhao J, Lang R, Guo X, Chen L, Gu F, Fan Y, et al. Clinicopathologic characteristics of pleomorphic carcinoma of the breast. Virchows Arch 2010;456:31-7 .

7. Tavassoli F, Devilee P, eds. Pathology and genetics of tumours of the breast and female genital organs. 3rd ed. World Health Organization of Tumors, 2003.

8. Arasi NE, Neelima G, Anunayi J, Kumar LS, Swaroopa MJ. Pleomorphic ductal carcinoma of the breast: A Rare Variant 2016;4:26-9.

9. Tang H, Liu F, Li H, Huang X, Zhao T. Pleomorphic carcinoma of breast: a case report and review of literature. International journal of clinical and experimental pathology. 2014;7(8):5215.

Pilonidal Sinus – "Bunch of Hair Tufts"

Dr. Wadhawan Gaurav

Assistant Professor
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Vyas K.C.

Professor and Head, Department of Surgery
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

ABSTRACT

A Pilonidal Sinus commonly occurs in the cleft between the buttocks (natal cleft), affecting mainly men from puberty to their thirties and can cause abscess formation with off and on pus discharge causing pain and agony, embarrassment and absence from work for these thousands of youngsters annually. It is notorious for chances of recurrence after surgery and the need for frequent and time consuming wound care. We report a case operated at Pacific Medical College and Hospital with a unique character of immense collection of tufts of hairs present in a small Pilonidal sinus. He was operated with Rhomboid excision and Limberg flap repair.

Keywords: Pilonidal Sinus, Rhomboid, Limberg Flap

INTRODUCTION

Pilonidal means nest of hairs and is derived from Latin words for hair (Pilus) and nest (Nidus)[1] The condition was first described by Herbert Mayo in 1833[2] . R.M.Hodges was the first to use the phase Pilonidal cyst to describe the condition in 1880[3] . The condition is also called 'Jeep riders' disease or 'Jeep Seat' disease, because a large portion of people who were being hospitalized for it rode in jeeps. During the Second World War this was common in jeep drivers.

Pilonidal disease has increased in incidence rating to 3 cases per 10,000 people affected a year[4]. It can be seen in young and old but more common in young male adulthood. It affects men twice as often as women. Pilonidal sinus disease is a common medical condition that accounts for almost 15% of anal suppuration with high morbidity.

Obesity, family history (38%), sedentary life or prolonged sitting or driving, hairy body, local irritation or trauma is the few risk factors of this disease[4.]

CASE REPORT

A 29 years young man reported at Pacific Medical College and Hospital with the complain of pus and blood discharge from lower back since last one or two months. He also complained of swelling at the presacral region. No significant family histories of same complain. No significant past history of any surgery at the same sight or any trauma. The subject is a sales-man by profession and is travelling nearly for two to three hours daily. He was clinically examined and it was found that he had a sinus in the midline of natal cleft with tufts of hairs peeping through and there was an adjacent lateral abscess inflamed and tender not allowing the patient to sit properly. His routine investigations for surgery were carried out and all were within normal limits. He was operated under spinal anaesthesia in lateral prone jackknife position. Working on the sinus tract we were surprised to see tufts of hairs kept on coming one after other from the small sinus tract and at the end we had good collection of tufts of hairs. Rhomboid wide excision was done and the sinus with abscess excised in toto and a

Limberg flap repair reconstructive surgery was carried out and a drain placed.

DISCUSSION

Pilonidal disease in the early 1950s was thought to be a congenital defect involving the remnant of the medullary canal and the infolding of the surface epithelium or a faulty coalescence of the cutaneous covering in the early embryonic stage,but most authors have belief now that the majority of Pilonidal disease cases are acquired and the result of a foreign body response to entrapped hair.

After the onset of puberty, sex hormones affect the pilosebaceous glands, and the hair follicles become distended with keratin. As a result, a folliculitis is created, which produces oedema and follicular exclusion. The infected follicles extend and rupture into the subcutaneous tissue, forming a Pilonidal abscess. This results in a sinus tract that leads to a deep subcutaneous cavity. The laterally communicating sinus overlying the sacrum is created as the Pilonidal abscess spontaneously drains to the skin surface.

Loose hairs are drilled, propelled and sucked into the Pilonidal sinus by friction and movement of buttocks. Whenever the person stands and sits these trapped hair stimulates a foreign body reaction and infection.

Our patient had a hairy body and yes the excess of hairs in and around the gluteal cleft increased the occurrence of the disease. His profession of constant travelling again made him a probable candidate for the Pilonidal disease. Therefore, we believe that management principle of Pilonidal disease should aim on removal of hairs from the sinus cavity and avoidance of future potential ports of hair entry.

Surgical treatment of a case of Pilonidal disease is either to go for excision and no suturing, second to get excision and simple closure and third is to have excision with reconstructive flap technique. Each of the procedures have their merits and demerits. Pilonidal disease recurrence is more in cases where the surgical patient is sutured in the midline as opposed to away from the midline, which obliterates the natal cleft and removes the focus of shearing stress. In our patient we went for Rhomboid excision with Limberg Flap repair which we have been practising in lot many of our Pilonidal cases and its giving us promising results with good recovery and less chances of recurrence.

CONCLUSION

Pilonidal disease as it is rightly called the nest of hairs, we have been witnessing several of these cases and yes their number is multiplying probably owing to their lifestyle, but this case was unusual to us in the context of innumerable or immense or we can say crazy collection of several tufts of hairs in a very small sinus cavity. We successfully completed our surgery with the wide excision and flap repair with low complication rate, short hospitalisation, low recurrence rate, early healing and shorter time off work.

REFERENCES

1. Ewing MR. Hair bearing sinus. Lancet 1:427,1947 CF The Pilonidal Disease in Recent Advances in Surgery - 7,2000,pg 132-137.

2. Lanigan,Michael (September27, 2012) "Pilonidal cyst and Sinuses", Mediscape.WebMD.Retrieved April 8,2018.

3. Hodges,RM (1880) "Pilonidal Sinus" The Boston Medical and Surgical Journal.103:485-586.

4. Ferri,Fred F. (2017) Ferri's clinical Advisor 2018E-Book:5 Books in Elsevier Health Sciences.p.995-ISBN9780323529570.

5. Bascom John and Bascom Thomas (October 2002),"Failed Pilonidal Surgery", Archives of Surgery.137(10):1146-50Doi:10.1001/archsurg,137.10,1146PMID12361421.

Pellagra - An Underrated Disease in Modern Practice

Dr. Bhardwaj S
Senior Resident, Department of Dermatology
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Sharma D
Senior Resident, Department of Dermatology
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Sharma K R
Professor, Department of Medicine
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

ABSTRACT

Pellagra is a nutritional disorder of niacin or its precursor tryptophan deficiency. It is a historically old but certainly not completely eradicated disease. Deficiency of niacin (Vitamin B3) leads to pellagra with constellation of symptoms affecting skin, gut and nervous system. We present a case of 37 year-old male presented with photodermatitis and neuropsychiatric symptoms, diagnosed clinically as pellagra and was treated successfully with niacin and vitamin B complex supplementation

Keywords: Pellagra, Niacin Deficiency, Photodermatitis, Nutritional Deficiency Disorders

INTRODUCTION

The term pellagra derived from *pelleagra* (Italian for *rough skin*) was first used by Frappoli in 1771 due to its dermatological manifestations[1]. Pellagra, once known as Austrian leprosy, is a chronic disease affecting the skin, nervous system and gastrointestinal tract due to the deficiency of niacin (Vitamin B3) or its precursor tryptophan[2]. It is classically known as the disease of 4 D's- dermatitis, dementia, diarrhoea and death. Dermatitis associated with pellagra is usually seen over photo-exposed sites with associated photosensitivity.

Niacin is found in whole grains and is enriched in bread products, nuts, dairy products, mushroom, dried beans, liver and animal meat.Pellagra is mostly found in parts of India, China and Africa where corn or maize are the staple food[3].

CASE REPORT

A 37 year old chronic alcoholic farmer from Udaipur, Rajasthan presented with complaints of well-demarcated, dark, scaly lesions associated with moderate itching over the sun-exposed parts of the body since 10 days. The lesions began over the dorsum of hands and neck as dull reddish, itchy raised lesions and were associated with severe photosensitivity which, with time, spread to the face and feet.The patient was lethargic and complained of loss of appetite.The family members also gave history of apathy, irritability, disorientation in aspects of time of the day and place. He was also aloof and less talkative which hinted for depression. There was no history of seizures, flushing, fever, diarrhoea or abnormal passing stool. There was no history suggestive of pulmonary tuberculosis or any other chronic illness. There was no history of any preceding drug intake.

The patient was a chronic alcoholic since 11 years. He was an occasional non-vegetarian with staple diet mainly being maizeand rice. He used to take less green leafy vegetables with less dairy products (<100 ml of milk/day) in his daily diet.

On physical examination, the patient was moderately built and poorly nourished. Body mass index was 17.8 kg/m^2(low BMI). Vitals were stable. Dehydration and pallor were observed. The cutaneous

examination revealed commissural cheilitis and glossitis. There was diffuse greasy fine scaling on the central face and scalp. There were symmetrical well demarcated hyperpigmented crusted plaques over the v-zone and around back of the neck [fig 1(a), 1(b)], dorsa of the hands, wrist and forearms [fig 1(c)] and dorsum of feet [fig 1(d)]. The cutaneous lesions showed clear demarcation on sun-exposed from sun-covered skin. The systemic examination, particularly neurological examination revealed no abnormalities and was unremarkable.

The patient was diagnosed clinically as having pellagra and was admitted for further evaluation. Laboratory investigation showed mild elevation of total white blood cell count (11300/mm^3), ESR (39mm/hr) and slightly elevated SGOT (73.2u/l). The remaining of the routine laboratory tests, including glucose, electrolytes and TSH, were found within normal range. The CT/MRI was not done in view of financial constraints.

Intravenous fluids and high-caloric nutrition was administered. Serological and urinary assays confirming niacin deficiency were unavailable in our hospital. Treatment with nicotinamide 500 mg/day orally with vitamin B complex supplementation was started. The patient was also advised topical application of sunscreen and emollients. Within 7 days of starting treatment, the patient showed marked improvement. The borders of the lesions became less well-defined, there was decrease in erythema and scaling [fig 2 (a-d)]. The patient was continued on niacin (250 mg twice a day) for 2 weeks along with daily vitamin B complex supplementation.


Before-Day 1	After- Day 7
Fig: 1(a)	Fig: 2(a)
Fig: 1(b)	Fig: 2(b)
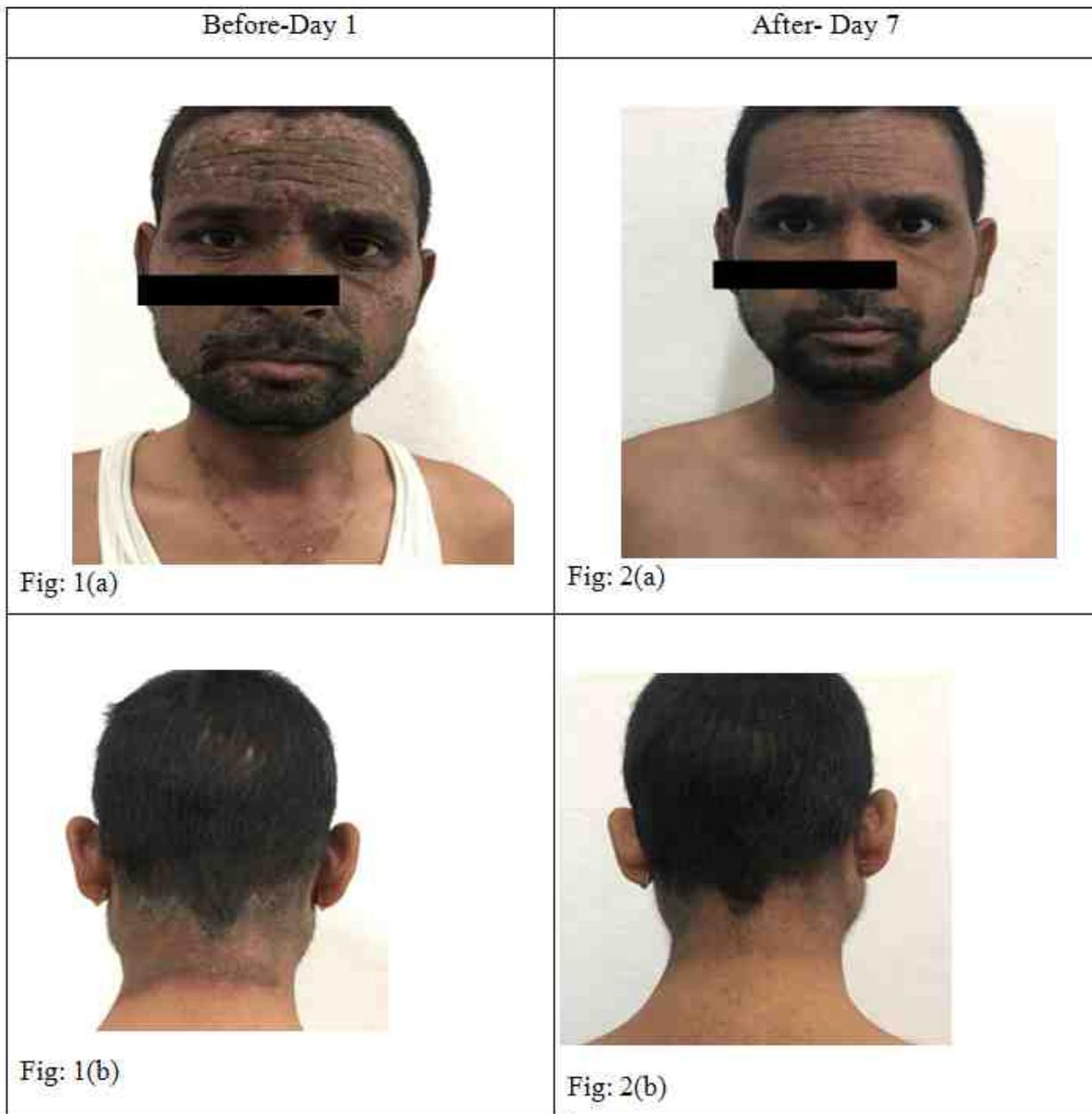
Fig: 1(c)

Fig 2 (c)

Fig: 1(d)

Fig: 2(d)

Fig: 1(e)

Fig: 2(e)

DISCUSSION

Pellagra is caused by deficiency of niacin. Niacin is a vitamin cofactor that can be obtained from diet or synthesized endogenously from essential amino acid tryptophan. Dietary niacin exists primarily in the form of nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP). NAD and NADP are hydrolysed in the intestinal lumen to form nicotinamide. Nicotinamide can be converted by intestinal bacteria into nicotinic acid to be absorbed into plasma. Nicotinic acid and nicotinamide then pass through liver, enterocytes and kidney where they are converted back to NAD and NADP.

Pellagra can be divided into primary and secondary disease. Primary pellagra is due to dietary deficiency or in population where staple food is jowar, corn or maize. Jowar contain high levels of niacin but high leucine content in it prevents the conversion of tryptophan to niacin, leading to deficiency of niacin. Maize contains bound niacin, so without alkaline hydrolysis to release the niacin, it is unavailable for absorption. Secondary pellagra is due to defective absorption or metabolism of niacin/ tryptophan (causes include chronic alcoholism; Hartnup disease; drugs such as antituberculosis medications- isoniazid, pyrazinamide;[6] mercaptopurine, phenobarbital; carcinoid syndrome; anorexia nervosa and Crohn's disease). Vitamin B6 deficiency also potentiates the niacin deficiency[4]. Tuberculosis patients can present with pellagra-like skin manifestations; when started on ATT containing isoniazid (pyridoxine-inactivating drugs); which can be confused with drug reaction.

The primary manifestations classically referred to as "the 4 D's:"- dermatitis, diarrhoea, and dementia, leading to death[4,5]. Pellagra may initially present with loss of appetite, fatigue, irritability, vomiting and pain abdomen. Photosensitive pigmented dermatitis soon follows. Dermatitis presents with symmetrical lesions affecting sun-exposed areas such as face (butterfly distribution), around the neck (Casal necklace/ Casal collar), dorsa of hands ('gauntlet'), and dorsa of the feet ('gaiter'). Gastrointestinal involvement may lead to intractable diarrhoea (which is found in 50% of the cases), nausea, vomiting, abdominal pain, anorexia. Neuropsychiatric symptoms include dementia or encephalopathy termed pellagrous encephalopathy, presenting with apathy, insomnia, nervousness, impaired memory, disorientation, depression or altered consciousness and death if left untreated. It is important to note that classical manifestations will not be seen in all patients as was noted with our patient[6,7]. In our case, the primary cause was chronic alcoholism and maize being the staple diet which leads to dietary deficiency of niacin. The clinical features were photo-exposed dermatitis involving face, v-zone and back of the neck, dorsa of hands and feet; and there was history of minimal neurological involvement, without any abdominal symptoms.

Differential diagnosis of pellagra includes severe zinc deficiency, carcinoid syndrome, Hartnup disease, other vitamin deficiencies such as pyridoxine deficiency, riboflavin deficiency, and dermatological conditions such as photodermatitis and actinic dermatitis. Zinc deficiency was ruled out as there is plenty of zinc in the local area. Carcinoid syndrome was ruled out on the basis of absence of flushing symptom, difficulty in breathing or diarrhoea; features suggesting hartnup disease like intermittent ataxia, nystagmus, and tremor, gross aminoaciduria were also absent. The patient had low BMI, was chronic alcoholic with poor nutrition; thus it was likely that patient had multiple water soluble vitamin deficiencies. However, niacin deficiency was prominent in view of classical photodermatitis and neuropsychiatric symptoms.

Treatment includes alleviation of any predisposing factors such as alcohol or drugs and avoidance of diet containing corn or maize solely. The administration of niacin has a dramatic curative impact on pellagra. The daily recommended dose is 300 mg of nicotinamide in divided doses, and treatment should continue for 3-4 weeks. The neuropsychiatric symptoms usually remit after 24-48 hours of treatment, but dermatitis may take 3-4 weeks to resolve. It is also recommended to administer vitamin B complex preparations since patients with pellagra, very often have a deficiency of other B vitamin compounds (7-9).

In our case treatment with tablet nicotinamide 250 mg twice daily with multivitamin supplementation improved the cutaneous manifestation within 7 days.

CONCLUSION

Pellagra is a nutritional disorder of niacin deficiency and is a historically old but certainly not completely eradicated disease. The classical 4D presentation may not be present in all patients. The characteristic-though not pathognomonic, cutaneous manifestations support its clinical diagnosis. Pellagra responds remarkably with niacin supplementation but can be fatal if untreated.

Declaration of Patient Consent:

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial Support and Sponsorship:

Nil.

Conflicts of Interest:

There are no conflicts of interest.

REFERENCES

1. Oldham MA, Ivkovic A. Pellagrous encephalopathy presenting as alcohol withdrawal delirium: a case series and literature review. Addict SciClinPract 2012;7: 12

2. Wan P, Moat S, Anstey A. Pellagra: A review with emphasis on photosensitivity. Br J Dermatol 2011;164:1188-200.

3. Russel RM. Vitamin and trace mineral deficiency and excess. In: Kasper D, Fauci A, Hauser S, Longo D, Jameson J, Loscalzo J, editors. Harrison's Principles of Internal Medicine. 19th ed. New York: McGraw-Hill; 2015. p. 96e-4.

4. Harsha NS, Suraj BM, Kanakavidu SS, Kodali R. Pellagra: A forgotten ailment in current clinical practice. Med J DY PatilVidyapeeth 2019;12:78-80

5. Savvidou S. Pellagra: a non-eradicated old disease. ClinPract. 2014;4(1):637. Published 2014 Apr 28. doi:10.4081/cp.2014.637

6. Norton SA, Ruze P. Kava dermopathy. J Am AcadDermatol1994;31:89-97.

7. Arif, Tasleem&Adil, Mohammad. (2018). Pellagra: An uncommon disease in the modern era-A case report. Journal of Pakistan Association of Dermatologists. 28. 360-363.

8. Garg G, Khopkar U. Ethionamide induced pellagroid dermatitis resembling lichen simplex chronicus: A report of two cases. Indian J DermatolVenereolLeprol. 2011;77:534.

9. Soni BP, McLaren DS, Sherertz MF. Cutaneous changes in nutritional disease. In: Freedberg IM, Eisen AZ, Wolf K, Austen KF, Goldsmith LA, Katz SL, editors. Dermatology in General Medicine. 5 th ed. New York: McGraw-Hill; 1999. p. 1725-37.

A Case of Ewing's Sarcoma of the Clavicle

Dr. Bharat Jain
Department of Radio-Diagnosis
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Kapil Vyas
Department of Radio-Diagnosis
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Ravi Soni
Department of Radio-Diagnosis
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

ABSTRACT

Aim: The Clavicle is a rare primary site for Ewing sarcoma (ES). We report one case of patient with clavicular ES under our tracking and review the related literatures on imaging of this rare tumor.

Methods and Material: A 22 year old female came with complain of swelling at clavicular region on right side in the radio-diagnosis department .However no pain or fever and the swelling were not tender. Patient is initially investigated with plain radiograph than with CT and MRI.

Results: We report here a case of ES of the clavicle in an adult female because of its rare site and difference from typical radiological appearances elsewhere.

Conclusions: Ewing's sarcoma of the clavicle is rare lesion with non - specific imaging findings different from that seen in other long bones. The MRI helped to characterize the lesion by defining the soft-tissue components of the tumor and the involvement of the adjacent bones.

Keywords: Ewing's Sarcoma; Adults; Clavicle

INTRODUCTION

It is evident that Ewing's Sarcoma is the second most common childhood bone cancer [1]. It occurs more often in the femur and pelvis however any bone can be involved. According to previous studies the age at diagnosis usually younger than 30 years, especially 10 - 15 years. It is more common in male with predominance 3:2, and 95% of Ewing sarcomas occurs in white patients [2,3].Ewing Sarcoma rarely affects the clavicle bone[4,6]. Clavicle has its oncological characteristics with flat bones and not with other long bones. Majority of clavicular tumor are malignant [4], and the diagnosis may be missed due to low level of suspicion. Clavicle has different features than other long bones [5]. It is the only long bone which located in horizontal axis in its anatomical position. It ossifies by membranous ossification and doesn't have a definite medullary cavity. There are one secondary center ossification and two primaries. It is the first bone to ossify in the embryo (fifth month). The clavicle can be resected without causing significant disability and it is in subcutaneous plane throughout its length. Supraclavicular nerve occasionally pierces the clavicle[7].

Because of rarity of the tumours in this bone and the relative lack of literature on the management of tumours in this bone, we report the imaging findings, distribution, clinical features and histopathological correlation with primary tumours and tumor-like conditions involving the clavicle.

CASE REPORT

A 22-year-old female presented to our department with an enlarging, palpable, painless mass in the region of the right sterno-clavicular joint. There was no history of trauma, and there was no restriction of shoulder joint movement.

The patient underwent X-rays which showed irregular bony destruction in its center part with increased bone mineral density and irregular periosteal reaction, and adjacent soft tissue swelling shadow in the 1/3 diaphysis of the clavicle(Figure1). However, the sterno-clavicular joint is normal. A thorax computed tomography demonstrate osseous destruction with obscure boundary, irregular bone cortex increased proliferation sclerosis, Onion peel reaction or lace sample layered, periosteal reaction in the distal end of the right clavicle (Figure 2,3), However there were no pulmonary nodules are seen. Magnetic Resonance Imaging (MRI) reported a lobulated, expansile abnormal signal signal intensity mass lesion involving medial end of clavicle and adjacent soft tissues appear hyperintense on T2 and STIR, isointense on T1 with destruction of cortical surface and adjacent irregular periosteal reaction . On Post contrast, heterogeneous avid enhancement was noted(Figure 4,5,6,7). A needle biopsy revealed small round blue cells consistent with Ewing's Sarcoma.

Figure 1: AP X-ray Chest

Figure 2: CT Thorax coronal view   **Figure 3:** CT Thorax Axial View

**Figure 4:** MRI Coronal T2   **Figure 5:** MRI Coronal T1
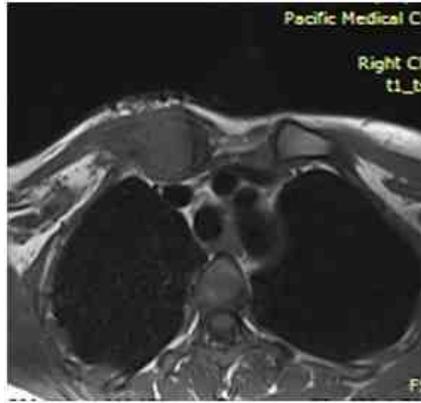
Figure 6: MRI Axial T1
　　　　　　　　Figure 7: MRI Axial T2

DISCUSSION

Ewing's Sarcoma is a poorly differentiated neoplasm composed of small-round-blue cells; it was originally described in 1921 by James Ewing [8]. Often presenting as a painful, rapidly growing soft-tissue mass 5–10 cm large, it typically arises from the medullary cavity with invasion of the Haversian system and has been described in virtually every bone in the body. It comprising about 4-6% of all primary bone tumors however reported as occurring at all ages. The maximum occurs within the first two decades. It is the most common primary neoplasm of bone after osteosarcoma in second decade. The most common site is in the diaphysis of long bones, less common in ribs, pelvis and vertebrae [12]. Involving head and neck in Ewing's sarcoma is very uncommon, approximately 1% to 4% of cases [13]. Males are predominantly affected than females; the ratio is 3:2. Ewing's sarcoma is more common in whites; blacks and Asians are unusually affected unlike osteosarcoma. [9]

Mostly patient come with complain of pain and local swelling, hyperthermia, anemia, increased erythrocyte sedimentation rate, dilated veins and leukocytosis. Previous trauma history is reported in many cases [13]. The typical imaging features of Ewing's sarcoma are a permeative destruction of bone along with a large soft tissue mass. It can cause a periosteal reaction with the characteristic lamination (onion skinning) or vertical spiculation in one half of the cases. Most usual imaging features reported in Ewing's sarcoma of the clavicle are as follows: a poorly defined permeative lesion with or without associated sun-ray spicules of the periosteal bone, localized honeycomb appearance, cortical erosion, and a soft tissue mass next to bony destruction, displacement or destruction.[10].

If CT is not used both intraosseous with adjacent soft tissue involvement is underestimated. In our study CT shows both the soft tissue mass and the intraosseous origin of the tumor is seen. Magnetic resonance imaging is the choice of imaging to evaluate the extent of the primary lesion, to monitor the response of chemotherapy and to follow up. To rule out skeletal metastasis bone scintigraphy is necessary and 201-thalium scanning is sensitive in the monitoring of the treatment response [14].

The Imaging differential diagnosis of Ewing's sarcoma of the clavicle consists of "osteogenic sarcoma, neuroblastoma, lymphosarcoma, eosinophilic granuloma, osteomyelitis, plasmacytoma and metastatic carcinoma". There is involvement of large soft tissue mass aided interpretation of Ewing's tumor from osteomyelitis and eosinophilic granuloma [10]. Age of the patient ruled out neuroblastoma, which is seen in less than 5 years age group. However, radio-diagnosis is not a totally reliable guide to interpretation and histopathological examination is compulsory to confirm the nature of the tumor.

Clavicular Ewing's Sarcoma having a better prognosis than long bone or pelvic location, since diagnosed earlier [15]. Treatment rates of have improved from 10% to 75% with the use of a of local therapy and extended multi-drug chemotherapy, to decrease both the incidence of local disease recurrence and the development of pulmonary and skeletal metastases. Complete surgical resection is preferred in Ewing Sarcoma local control in those instances when surgery can be performed with minimal loss of function and disfigurement [8]. To conclude, although the classical feature i.e. "onion peel type periosteal reaction described in Ewing's sarcoma elsewhere, may not be present, a lytic expansile lesion of the clavicle with a soft tissue mass and intramedullary origin should suggest in young age the possibility of Ewing's Sarcoma as a differential diagnosis".

CONCLUSION

We have described a rare case of Ewing's Sarcoma of Clavicle showing excessive fibro-osseous response which is not a frequent presentation. Because of its high metastatic potential, Ewing's sarcoma demands early intervention. Evaluation of lesion using plain radiographs, CT, MRI, biopsy followed by histopathology and immunohistochemistry are necessary for early diagnosis.

REFERENCES

1. Sarcoma and Primitive Neuroectodermal Tumors," Pediatric Clinics of North America, Vol. 44, No. 4, 1997, pp. 991-1004. doi:10.1016/S0031-3955(05)70541-1

2. J. M. Kissane, F. B. Askin, M. Foulkes, et al., "Ewing's Sarcoma of Bone: Clinicopathologic Aspects of 303 Cases from the Intergroup Ewing's Sarcoma Study," Human Pathology, Vol. 14, No. 9, 1983, pp. 773-779. doi:10.1016/S0046-8177(83)80300-1

3. K. K. Unni, "Dahlin's Bone Tumors: General Aspects and Data on 11,087 Cases," Lippincott-Raven, Philadel- phia, 1996, pp. 249-261.

4. Dahlin DC, Unni KK. Bone tumors: general aspects and data on 8542 cases, 4th edn. Springfield, IL: Thomas; 1986. [Google Scholar]

5. Ellis H, Johnson D. Pectoral girdle, shoulder and axilla. In: Standring S, editor. Gray's anatomy. The anatomical basis of clinical practice. 39th. Edinburgh: Elsevier Churchill Livingstone; 2005. [Google Scholar]

6. Klein MJ, Lusskin R, Becker MH, Antopol SC. Osteoid osteoma of theclavicle. ClinOrthop. 1979;143:162. [PubMed] [Google Scholar]

7. Wood VE. The results of total claviculectomy. Clin Orthop Relat Res. 1986;207:186–190. [PubMed] [Google Scholar]

8. J EwingThe classic: diffuse endothelioma of bone. Proceedings of the New York Pathological Society. 1921;12:17Clin Orthop Relat Res, 450 (2006), pp. 25-27[PubMed]

9. Eggli KD, Quiogue T, Moser RP. Ewing's sarcoma: RCNA 1993 Mar; 31(2): 325-37.

10. Yalein S, Turoglu T, Ozdamar S et al. Ewing's tumor of the mandible: Oral surgery oral med oral pathol 1993; 76: 362-7.

11. Fielding AF, Lindemeyer R, Wood-Hartman MJ. Ewing's sarcoma of the mandible: combined approach to treatment: J Clin Pediatr Dent 2002 summer; 26(4): 409-12.

12. Hardy P, Gibbs AR. Ewing's sarcoma of mandible: British Journal of Oral and Maxillofacial Surgery 1984; 22: 287-94.

13. Fonseca AS, Mezzalira R, Crespo AN, Bortoleto AE Jr, Paschoal Jr. Ewing's sarcoma of the head & neck: Sao Paula Med J 2000 Nov; 118(6): 198-200.

14. Henk CB, Gramp PS, Wiesbauer P et al. Ewing sarcoma. Diagnostic imaging: Radiologe 1998 Jun; 38(6): 509-22.

15. Langman AW, Kaplan MJ, Matthay K. Ewing's sarcoma of the mandible: Otolaryngol Head Neck Surg 1989 Jan; 100(1): 74-

Case Report

Trichotillomania in a Patient with Psychosis

Dr. Suresh Kumar Mehta
Prof. and HOD, Dept. of Psychiatry
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Pinki Trivedi
Clinical Psychologist and Counselor,
Dept. of Psychiatry, Pacific Medical College
and Hospital, Bhillo ka Bedla, Udaipur

Dr. Neeraj Kumar Tripathi
Clinical Psychologist and Counselor,
Dept. of Psychiatry, Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

Dr. Shivani Bhardwaj
Assistant Professor, Dept. of Dermatology
Pacific Medical College and Hospital,
Bhillo ka Bedla, Udaipur

Dr. Divya Sharma
Senior Resident , Dept. of Dermatology
Pacific Medical College and Hospital,
Bhillo ka Bedla, Udaipur

Dr. S. K. Sharma
Consultant Psychiatrist , Dept. of Psychiatry
Pacific Medical College and Hospital,
Bhillo ka Bedla, Udaipur

ABSTRACT

Trichotillomania also known as hair pulling disorder is a sub category of obsessive compulsive spectrum disorder characterized by repeated hair pulling from various sites with an increased tension prior to hair pulling and the person gets relief following the act. Trichotillomania is not always a focused act but in fact hair pulling occurs in impulsive episodes . Trichotillomania has two subtypes namely "automatic" versus "focused" hair pulling. Various psychiatric disorders are associated with cases of Trichotillomania.4

A case of 30 year old male patient was presented in our psychiatric out patient department and he was diagnosed to suffer from Trichotillomania with Psychosis.

Keywords: Trichotillomania, Hair Pulling Disorder, Psychosis

INTRODUCTION

Trichotillomania (TTM) or compulsive hair pulling also called as hair pulling disorder is a psychiatric disorder. It usually presents with urge of pulling out one's own hair. It is classified under Obsessive compulsive and related disorders (OCRD) category of DSM-5 and ICD -11 Systems of the disease classifications (American Psychiatric Association, 2013)[6]. There is an irresistible urge to pull hair. The commonest areas for hair pulling are head and areas around the eyes. The name for this disorder was created by Francois Henri Hallopeau in 1889.[11]

There can be strong family history of the disorder. It is more common with obsessive compulsive disorder. Episodes of pulling may be preceded by abounding anxiety. Similar picture can be seen in Body Dysmorphic Disorder (however it can be differentiated by the fact that people remove hair so as to improve their look) or it can be confused with a case of Alopecia Areata. Many psychiatric problems can be associated with a case of Trichotillomania that usually presents for the first time in adulthood.

Depression, Anxiety disorders, Obsessive Compulsive Disorder and Psychosis are the common psychiatric disorders known to present concomitantly with trichoti1lomania. Trichotillomania can involve multiple sites but in most of the cases it usually involves one or two sites. The most *common hair* pulling site is scalp and then is followed by the eyebrows, eyelashes, face, arms, and legs in descending order. Very rarely it can involve areas like the pubic area, beard underarms, and chest[11]. Most of the children pull hair from scalp area.

In Trichotillomania three clusters were identified, namely :1) Simple TTM- means cases without any comorbidities 2) Depressive TTM-means cases with comorbid Major Depression and 3) Complex TTM-means cases with combinations of the investigated comorbidities.[12]

In Trichotillomania, usually one hair is pulled out at a time and single episode may last from minutes to hours together. This urge to pull hair

may diminish or totally vanish in an individual with time but recurrence or relapse is common.

Clinical examination of these patients with Trichotillomania exhibit hair of differing lengths. There can be broken hair with blunt ends, broken mid-shaft hair or some uneven stubble or some tapered ends of re-growing hair. We can usually see normal hair density and usually hair pull test is negative. It is not easy to pull out the hair and an unusual shape will be found in areas of hair pulling.

Individuals with trichotillomania definitely present with secondary psychological effects. There can be avoidance and isolation, the fear of socializing, shyness, low self-esteem and shame[11]. They may also be worried about negative attention. Some people diagnosed with trichotillomania try to prevent this negative reaction by wearing hats, wigs, false eyelashes or eyebrow pencil. Additional stress can worsen the condition.

Trichotillomania can be an effect of underlying frustration. But in long term, embarrassment about hair pulling can lead to severe emotional distress and painful isolation, which in long run can lead to co-occurring psychiatric disorder. Hence prompt and urgent professional help is needed in coping with this problem[17].

Here we are presenting an interesting case of Psychosis with Trichotillomania in a middle-aged male patient.

CASE REPORT

A 30 years old Mr. Y was brought to psychiatry outpatient department by his brother and father for evaluation in view of history suggestive of abnormal behavior, not working, not taking interest in routine daily activities, irritability at times, sleeplessness and weight loss since 4 to 5 months. The patient was apparently alright about 5 months ago when he developed all above symptoms gradually. There was history of family disputes with spouse prior to the onset of the illness. There is history of tobacco addiction but no alcohol or other substance abuse. In addition, relatives noticed loss of hair on scalp. There was no history of fever, any infection, convulsions unconsciousness, any skin pigmentation or drug reactions.

There is no history of any other major psychiatric or medical illness in the past. Family history also did not reveal any major physical or mental illness. Father reported sensitive, emotional nature of the patient since childhood. Patient has been educated upto tenth standard and is working as a farmer.

On evaluation, patient showed symptoms and signs of psychosis. He had anxiety and the affect was inappropriate and was not correlated with the mood. Blunting and poverty of thoughts were there. Judgment and insight were partially impaired. The mental status examination revealed no other major abnormal findings. His higher neurological functions were normal and he was relevant. On probing, he revealed that he gets an urge and pulls out his own hair since last 4 to 5 months. He could not control his urge and was feeling tense till he pulled out his hair. (Figure 1 To 4) There was no associated itching on the scalp.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

A diagnosis of Psychosis with Trichotillomania (Complex TTM) was made after thoroughly investigating the case. His routine blood counts, BSL, renal profile, thyroid function tests, NCCT Brain, liver function tests, VDRL, HIV test, EEG and ECG were normal.

Dermatological reference was done and they confirmed the diagnosis of trichotillomania after ruling out alopecia areata. Patient and relatives did not give consent for dermatoscopy and scalp skin biopsy, which could have given clear confirmation of the condition. A good skin biopsy can reveal traumatized hair follicles with perifollicular hemorrhage, regenerating normal hairs, fragmented hair in the dermis, multiple catagen hair, empty follicle, and deformed hair shafts.[11]

Patient was started on antipsychotic Tab. Olanzapine 5 mg two times a day, Tab. Sertraline 50 mg two times a day, Tab. Clonazeparn 0.25 mg two times a day and multivitamins. In addition, cognitive behavior therapy and habit reversal training were started. The relatives were counselled regarding the nature of the disease so that patient could be understood well and can get good emotional support. His spouse was called for family therapy and we tried to help improve their interpersonal relationships.

Patient started showing some improvements and was assured about regular treatment and behavior therapy sessions. He reported that pulling of hair had decreased. Regular follow ups and long-term treatment was assured. Follow up with the dermatologist was planned and we expected to get consent for tracheoscopy in near future.

DISCUSSION

Trichotillomania is more prevalent in children with a peak age being between 7-14 years[3]. The cases having childhood onset have better prognosis and the prognosis worsens with the advancing age of onset. About 1-4% of the general population is affected with trichotillomania of various types and females have higher incidence than males[6]. As previously stated, Trichotillomania has higher comorbidity with various psychiatric

disorders such as OCD, Depression, Schizophrenia, Body Dysmorphic Disorder and Anxiety Disorders[4]. But unfortunately, the exact prevalence is not yet clear. Few cases

of dissociative disorder[2], Parkinsonism[7] and dementia[5] can also present with Trichotillomania.

In trichophagia, patients in addition to the act of hair pulling, also ingest the hair that they pull. In extreme cases formation of hair ball (trichobezoar) in stomach with gastro internal obstruction as a result of trichophagia can be found. In a study done by Tsai and Chang (1998), repetitive hair pulling behavior was linked to the psychotic state which improved with antipsychotic medications[8]. But such relation between hair pulling behavior and psychosis was not confirmed by many other studies. The neurocognitive model sees trichotillomania as a habit disorder. The basal ganglia are important in habit formation while the frontal lobes are critical for normally suppressing or inhibiting habits-In view of this neuro anatomy and neuro physiology Trichotillomania can be viewed as a habit disorder.

Abnormalities in the caudate nucleus has been suspected in OCD, while another study has shown that some patients with Trichotillomania have decreased cerebellar volume[11]. In our case, occurrence of Trichotillomania with concomitant Psychosis was evident.

Studies support the use of selective serotonin reuptake inhibitors (SSRI) and tricyclic antidepressants like clomipramine in the treatment of Trichotillomania[10]. Addition of antipsychotics and benzodiazepines to SSRIs in our patient gave the best results due to a mix picture of trichotillomania with psychosis with secondary anxiety symptoms.

CONCLUSION

Trichotillomania (hair pulling disorder) is grouped under the obsessive-compulsive spectrum disorder. It presents with self pulling out of the hair from various sites. The hair pulling starts with increased pressure and there is relief of tension following the act. (10) Comorbidity with various psychiatric disorders has been documented. In Trichotillomania three clusters were identified, namely:

1. Simple TTM - means cases without any comorbidities

2. Depressive TTM- means cases with comorbid Major Depression and

3. Complex TTM- means cases with combinations of the investigated comorbidities

Trichotillomania presenting for the first time in adulthood usually arises from another underlying psychiatric disorders. Initiation of the illness has a strong stress associated component[11].

In this 30-year-old male patient presented with hair pulling, psychotic features and behavioral problems, a diagnosis of Complex TTM (Trichotillomania with Psychosis) was made. Patient was thoroughly investigated and treated. Reference to dermatology was given and cognitive behavior therapy along with habit reversal training was initiated. Patient had some improvement. He has been advised to continue regular treatment and follow ups.

Informed consent of the Patient:

The authors disclose that they have obtained all appropriate patient consent forms. In the form, consent has been given by patient for reporting his clinical information and images the journal. The patient and relatives understand that his name and other particulars will not be published and utmost efforts will be made to conceal his identity, but we cannot assure the anonymity.

Financial sponsorship:

Nil

Conflicts of Interest:

Nil.

REFERENCES

1. Rajmohan V. Trichotillomania in Schizophrenia. Kerala Medical Journal 2009; 9:217-19.

3. Malhotra S, Grover S, Baweja R, Bhateja G. Trichotillomania in children. Indian Pediatr 2008; 45:403-

5. Comprehensive Textbook Of Psychiatry, 9th edition, Kaplan and Sadock

6. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Washington, DC: American Psychiatric Publishing;2013.

7. Tsai S, Chang F. Repetitive hair pulling associated with schizophrenia. Br J Dermatol 1998; 138:1095-6.

8. Bhatia M. , Jagawat T ., Choudhary S.,Delusional Parasitosis : a clinical profile . Int . Journal Psychiatry Med . 2000 ;30 ; 83-91

9. Case Report :Trichotillomania in Delusional Disorder :Bindoo Jadhav (Professor), Anagha Jog (Resident Doctor), Bharat Shah (Professor and HOD , Department of Psychiatry, K. J. S omaiya Medical College and Research Centre, Sion, Mumbai. Indian Journal of Mental Health 2016 ; 3(1)

10. Trichotillomania : Wikipedia htttps://en.wikipedia.org/w/index.php.Trichotillomania

11. Comorbidity in Trichotillomania : A cluster analytical approach : original research : Brain and Behaviour : WILEY

Lumbar Disc Herniation with Radiculopathy

Dr. Narendra Tiwari (PT)

Assistant Professor,
Pacific College of Physiotherapy
Pacific Medical College and
Hospital, Bhillo ka Bedla, Udaipur

"Mrs.Gaytri", aged 57-year-old homemaker, resident of Udaipur city, had **low back pain and in recent times left leg pain history of 15 days, is presented.** Mrs.Gaytri approached me after an orthopedician from our own institute reviewed of her case and told for physiotherapy consultation. Pain is worsening day by day.

INJURY MECHANISM

Mrs.Gaytri **could not recall a solo incident recounting to the inception of her back pain**. Few weeks before developing back pain, she had been working in kitchen and did find strain on bending over tables. The pain began in her lower back centrally and then started transmitting straight down to the back of left thigh and into her ankle, foot, calf, and toes.
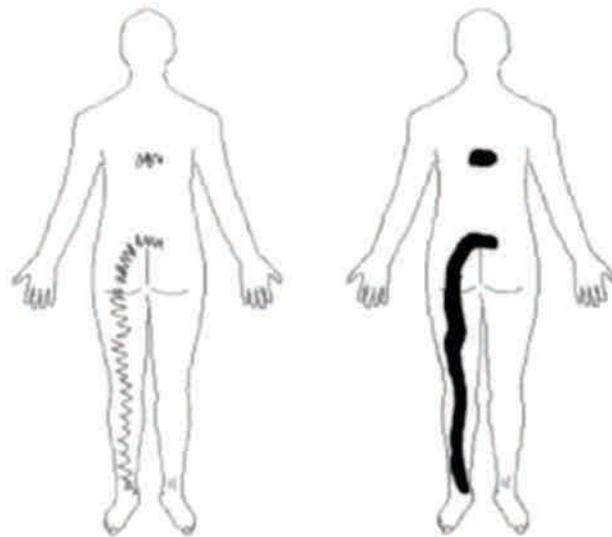
PRESENT SYMPTOMS

Pattern for 24 Hrs:

- **Very bad pain in the morning hours**. Mrs.Gaytri senses stiff and crooked in morning, she is bedridden and not capable to perform her day today activities on her own. Even to visit, toilet she needs aid of her family members.

- She is having, numbness or pins and needles in left leg and leg became heavy in night.

Factor which aggravates, ease her back, and leg pain:

- Lying down (Supine, Prone and Left side lying).

- Sitting down.

- No Movement for quite long time or getting cold

- Pain augments within 15 minutes of each persistent position. This pain takes about 2 hours to reduce up to easiness (mainly with help of posture change and walking).

- With only right side, lying posture patient gets reduction, easing in back and leg pain.

Identification of problem, corresponding medications & ongoing treatment:

- On Lumbar spine CT analysis, it was found that a L5-S1 disc protrusion with left S1 nerve root was being compressed.

- Orthopedician prescribed Lupiflex 8mg, Rabium 20mg and Axinac P. Out of those, Mrs.Gaytri continued usage of Lupiflex 8mg and Axinac P in their maximum possible daily quantity. Even with those, there was no sustained improvement in pain and function though she felt ok at the time of consumption of these.

Health & social account:

- Her health was normal and there were **no other *red flags*** in the subjective evaluation.

- Since Mrs.Gaytri **was incapable to move out of her bed,** was **anxious as to when she can handle her domestic work** in her present pain condition.

- Mrs. Gaytri spoken about her concerns about pain and the lack of progress, and above all was puzzled on the origin of her trouble.

SUBJECTIVE ASSESSMENT SCRUTINY

My **primary hypothesis for the cause of symptoms was a lumbar disc herniation linked with radiculopathy (LDHR) after** the subjective assessment. In particular as per CT scan results, L5/S1 disc protrusion with left S1 nerve root compression was found.

Reasoning adopted for the hypothesis is based on followings:

- Distribution of pain subsequent to S1 **dermatome**.

- High severity of 10/10 in the leg and 6/10 in the back i.e. **worse distally**.

- Moderate irritability (no position of easiness except right side lying, takes 2 hours to reconcile somewhat).

- **Strong provocative character** to own morning pain and stiffness.

There is **no single feature that provides the analysis of lower limb radiculopathy** (often referred to as sciatica), but extra research suggest a with a **amalgamation of the subsequent features** diagnosis of LDHR is better exact (Ford, Hahne, Chan, &Surkitt, 2012; Jacobs et al., 2011; Koes, Van Tulder, &Peul, 2007; Van der Windt, et al., 2010).

- **Distribution of symptoms**

○ Unilateral leg pain is more compared to low back pain.

○ Pain radiating in a dermatomal pattern, below the knee and into the foot or toes.

○ Numbness and paraesthesia in the identical allocation,

- **Positive signs on neurodynamic and neurological examination**

○ Straight leg raising test causes more leg pain.

○ Neurological deficits which are limited to one nerve root.

- **Positive symbols on MRI and CT imaging** of lumbar disc herniation consequential in nerve root compression

TESTING OF HYPOTHESIS

With the aim for attestation of my principal hypothesis, it was crucial to agree on if there were positive signs on the straight leg raise test and neurological deficits on the physical examination. The secondary hypothesis, which required to be ruled out, was somatic referred pain, which could be implicated, or disregarded subsequent the neurological and physical examination (Van der Windt, et al., 2010).

PHYSICAL EXAMINATION

Observation of posture and function:

- Standing pattern was the first observation I made.

- In her standing position, her **shoulders shunted to the right side, her back extended and pelvis anteriorly tilted, and there was evident hyper-tonicity of the lumbar para-spinal muscles right side**.

Picture to exhibit the posture of Mrs.Gaytri on initial presentation. Occasionally it is not this observable and if I am not sure if there is a list present, I run my fingers down the spinous processes to double check. This is when I find the tiny lists, which are not noticeable but still medically pertinent and reply well to list-correction strategies

Above-mentioned shunted antalgic posture is generally referred to as a lumbar list. Observation of a lumbar list regrettably is a test lacking in trustworthiness (Clare, Adams, & Maher, 2003). Maitland (2005), though it teaches us that in case a person presents with a recognizable postural deformity, they will be more demanding to get better. In her case, she had a contralateral list (shoulders listed to the reverse side of back/leg pain), which is thought to react better to treatment than an ipsilateral list.

With my experience antalgic postures are extremely vital to spot since they indicate a protective position; mechanism which is being adopted by body (often subconsciously) in the acute phase of injury to guard the injury, and if the antalgic posture is not cautiously examined and cautiously corrected, it can make the patient a lot worse.

Active range of movement:

- Lumbar flexion limited due to left-sided back pain.

- Extension limited due pain left buttock and leg.

- Other actions not examined day 1 due to severity and irritability.

Neurological Aspect of Examination:

- Weak single leg calf raise (SLCR) and was only capable to carry out three assisted raises to 50% range. Gr 3(-) strength of left leg SLCR.

- Other myotomal weakness was not detected.

- The S1 reflex on the left side was not present, with other lower limb reflexes preserved.

- Sensory changes were distinguished along with S1 dermatome.
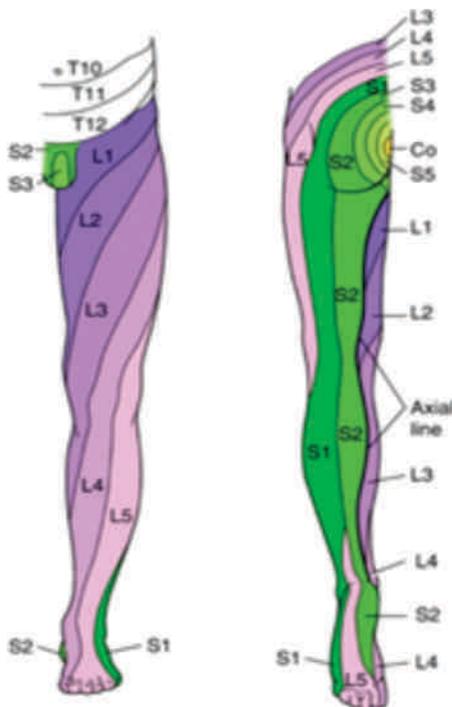
Neurodynamic Aspect of Examination:

- The *straight leg raise test (SLR)* was positive for reproduction of Patient's posterior thigh pain and restricted at 20 degrees on the left side.

- Her right SLR was limited by hamstring tightness at 50 degrees.

The research proposes the SLR steadfast re-assessment asterisks for patient advancement. It has shown to be 91% sensitivity and 26% specificity in identifying lumbar disc pathology (Jensen, et al., 1994). Deville et al. (2012) recognized that **more than an 11-degree divergence** in hip flexion range among sides was a **clinically noteworthy result.** Compared to MRI, the SLR test has meagre diagnostic correctness, and as a result is again and again used in conjunction with these imaging.

Manual palpation:

- With applying pressure only to the onset of pain, Palpation conducted in the left side lying position.

- The occurrence of generic hyperalgesia made it difficult to ascertain an analogous finding day 1.

ANALYSIS OF PHYSICAL ASSESSMENT & MAIN PRIMARY HYPOTHESIS

The main hypothesis of L5/S1 lumbar disc herniation with linked S1 radiculopathy was **acknowledged** based on the following observation:

1. Existence of pain allocation along the S1 dermatome,

2. Restricted S1 reflex,

3. S1 Myotome Weakness,

4. Positive left side SLR,

5. Relationship among these physical observations and the results of the lumbar CT scan.

TREATMENT

Treatment Day 1:

- Listing of restructuring with right side gliding exercises in standing. This was marked during the physical test as a valuable pain plummeting technique.

- The result of this treatment was abridged LBP and amplified Lumbar ext AROM, condensed list in standing, and less pain with walking.

McKenzie method has been used to derive Directional preference mechanical loading strategies (MLS). These are general approach used in the treatment of discogenic low back pain (Ford, Surkitt, & Hahne, 2011). The centralisation phenomenon, i.e. abolishment of distal symptoms because of recurring movements of the lumbar spine are key trait of using MLS in assessment and cure. By application of this principle of MLS, I gone ahead with right side glide as my direction of treatment as it resulted in concentrated of Patient's leg pain.

With placement of elbow against the wall, it supports the trunk and allows the side gliding movement to be limited to a small area to the lumbar spine. Request the patient to move their hips near the wall stopping at the first point or uneasiness or pain. Habitually on Day 1 this is only ended on one side.

On second action day of one, Taping was provided. This was warranted as a means of maintaining the improved spinal pose, dipping load through the disc and eventually reducing inflammation (Ford, et al., 2012; Ford, et al., 2011).

When she complained of particularly painful movement direction, I limit that movement on the first day. So, move into the directions in which she feels good and try avoiding from aggravating pain in the movement that hurts. With limitation to range, all forward bending must be avoided.

Taping with vertical strips will disable lumbar flexion. This taping to add to proprioception and patient knowledge about their lumbar flexion throughout functional movements.

Advice was the concluding constituent of the day 1 treatment, which was as follows:

- To avoid long-standing bed rest and sitting, & to go for habitual small walks to help supervise the stiffness.

- Education for the desired timeframes for recovery (months) and probable prognosis (identified by advancement and reassessment Day 2/3) to augment self-management and to diminish the likelihood of re-aggravation.

Application of **three different treatment** strategies for the very first treatment may be reasonable with the following consideration:

- The persistent pain nature,

- Deteriorating symptoms,

- Lack of reply to preceding treatment

- The patient's poor thoughtful of the issue

Main purpose of the day 1 treatment was to determine **if any change could be made with physiotherapy**, or the patient was required to refer for a neurosurgical consult.

DAY 2 ASSESSMENT AND TREATMENT

SUBJECTIVE ASSESSMENT

- Patient has shown improvement in LBP with back pain 4/10 and leg pain 7/10 – approximate improvement of around 30%.

- Morning stiffness sustained but Patient was capable to get out of bed and move around on her own

- Heaviness in leg not reported.

PHYSICAL ASSESSMENT

- The trail physical parameters/characteristics were re-assessed:

o Contralateral lumbar list in standing – enhanced but was still there (somewhat),

o Lumbar AROM – Flex (left LBP) R (mid-thigh) and extension (left LBP) R (10 degrees).

o SLCR and SLR - unaffected.

- **New assessment – Motor control of Transversus Abdominus (TrA).**

o With understanding that taping helped to boost the sense of solidity roughly the lumbar region, I was fascinated to discover if activation of stabilising muscles could display the similar treatment effect.

o This was examined in standing, with the augmentation of TrA activation before and all the way through lumbar active movements and in supine as a difference of the active straight leg raise test.

- **Second Assessment - Lumbar passive physiological intervertebral movements (PPIVMS).**

o Evaluation exposed a deficit in rotation movement between L5 and S1 segments on the left side, restricted by pain.

o In above case, patient was given Gr III- rotation mobilisations at 30-second gap.

o On re-evaluation, there was a reduction of pain at 10 degrees of lumbar extension AROM and diminution of thigh pain on walking.

- As patient had better, **day 1 session was repeated with reassess of the list of exercise and re-application the**

lumbar tape.

PROGNOSIS AND PROGRESSION OF TREATMENT

With **a number of neurological deficits, p**atient had been **symptomatic of problem for at least last 15 day.** After providing two cures and treatment, there were encouraging signs of improvement (in pain and function, not neurological signs) in patience. In case the improvement continued she will probably have the same prognosis of pain reduction and recovery of disability & function, with conservative treatment, when compared to lumbar micro discectomy at 1-2 years post injury (Jacobs, et al., 2011; Peul, et al., 2008).

Ford, et al. (2012) suggests that a **functional rehabilitation program is the most suitable treatment for Mrs.Gaytri's problem**, which will include the below mentioned characteristics:

- Daily living as well as work activities capacity restoration

- Meaningful goals negotiation.

- In order to achieve increase psychological and physical tolerances, Development of graded exercise schedule of functional tasks.

- Focused intend to increase cardiovascular fitness, flexibility and strength and,

- For getting targeted results cognitive-behavioural approach to deal with psychosocial barriers.

CONCLUSION

- A grouping of physical assessment findings, and correlation with the results of CT/MRI scan shall be used for the primary hypothesis of lumbar disc herniation with associated radiculopathy.

- The patient has an adequate amount of signs of compressive radiculopathy that hints for a neurosurgical review in case Patient's condition deteriorated.

- A functional restoration program is probably the best suited treatment approach for this problem subsequent to the initial phase of treatment and resolution of the lumbar list.

- It is expected that patient will probably have a good prognosis for recovery, and in the long-term get back her pre-morbid level of function in view of improvement shown within the first two sessions, and in light of the substantiation.

 BIBLIOGRAPHY

Boyd, B. S., & Villa, P. S. (2012). Normal inter-limb differences during the straight leg raise neurodynamic test: a cross sectional study. *BMC musculoskeletal disorders, 13*(1), 245.

Clare, H., Adams, R., & Maher, C. (2003). Reliability of detection of lumbar lateral shift. *Journal of manipulative and physiological therapeutics, 26*(8), 476-480.

Devillé, W., van der Windt, D., Dzaferagic, A., Bezemer, P.,

&Bouter, L. (2000). The test of Lasegue: systematic review of the accuracy in diagnosing herniated discs. *Spine, 25*(9), 1140-1147.

Ford, J. J., &Hahne, A. J. (2013). Pathoanatomy and classification of low back disorders. *Manual therapy, 18*(2), 165-168.

Ford, J. J., &Hahne, A. J. (2013). Pathoanatomy and classification of low back disorders. *Manual therapy, 18*(2), 165-168.

Ford, J. J., Hahne, A. J., Chan, A., &Surkitt, L. D. (2012). A classification and treatment protocol for low back disorders Part 3-Functional restoration for intervertebral disc related disorders. *Physical Therapy Reviews, 17*(1), 55-75.

Ford, J. J., Surkitt, S. L., &Hahne, A. J. (2011). A classification and treatment protocol for low back disorders Part 2-Directional preference management for reducible discogenic pain. *Physical Therapy Reviews, 16*(6), 423-437.

Hahne, A., Ford, J., Surkitt, L., Richards, M., Chan, A., Thompson, S., et al. (2011). Specific treatment of problems of the spine (STOPS): design of a randomised controlled trial comparing specific physiotherapy versus advice for people with subacute low back disorders. *BMC musculoskeletal disorders, 12*(1), 104.

Hahne, A. J., Ford, J. J., &McMeeken, J. M. (2010). Conservative management of lumbar disc herniation with associated radiculopathy: a systematic review. *Spine, 35*(11), E488-E504.

Jacobs, W. C., van Tulder, M., Arts, M., Rubinstein, S. M., van Middelkoop, M., Ostelo, R., et al. (2011). Surgery versus conservative management of sciatica due to a lumbar herniated disc: a systematic review. *European Spine Journal, 20*(4), 513-522.

Jensen, M. C., Brant-Zawadzki, M. N., Obuchowski, N., Modic, M. T., Malkasian, D., & Ross, J. S. (1994). Magnetic resonance imaging of the lumbar spine in people without back pain. *New England Journal of Medicine, 331*(2), 69-73.

Koes, B. W., Van Tulder, M. W., &Peul, W. C. (2007). Diagnosis and treatment of sciatica. *BMJ: British Medical Journal, 334*(7607), 1313.

Maitland, G. D., Hengeveld, E., Banks, K., & English, K. (2005). *Maitland's vertebral manipulation*: Elsevier Butterworth-Heinemann Edinburg.

Peul, W. C., Brand, R., Thomeer, R. T., &Koes, B. W. (2008). Improving prediction of "inevitable" surgery during non-surgical treatment of sciatica. *Pain, 138*(3), 571-576.

Van der Windt, D. A., Simons, E., Riphagen, I. I., Ammendolia, C., Verhagen, A. P., Laslett, M., et al. (2010). Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain (Review). *Cochrane Database Syst Rev, 2*(2).

Unicystic Ameloblastoma of Mandible

Dr. Priyank Rai

Senior lecturer, Department of Oral
& Maxillofacial Surgery, Pacific Dental College
& Research Centre, Bhillo ka Bedla, Udaipur

Dr. Nilesh Bhanawat

Reader, Department of Oral & Maxillofacial
Surgery, Pacific Dental College
& Research Centre, Bhillo ka Bedla, Udaipur

Dr. Shilpi Mathur

Tutor, Pacific Dental College & Research Centre,
Bhillo ka Bedla, Udaipur

Dr. Ansha Shrimal

Tutor, Pacific Dental College & Research Centre,
Bhillo ka Bedla, Udaipur

INTRODUCTION

Unicystic ameloblastoma, is one of three clinical variants of ameloblastoma, the other two being the more common intraosseous solid or multicystic (conventional) ameloblastoma and are rarely encountered as peripheral ameloblastoma (Robinson & Martinez, 1977). This variant of ameloblastoma has become established as a distinct clinicopathological entity not only on the basis of its unicystic radiographic appearance but also of its histopathologic features. It is often associated with an unerupted tooth with its occurrence more commonly in mandible of younger patients. It has been also seen that the recurrence rate after conservative surgical treatment is much lower as compare to its conventional counterpart. unicystic ameloblastoma classified into three types with prognostic and therapeutic implications (Ackermann et al, 1988):

a). Type 1 comprises of unilocular cystic lesions lined by epithelium exhibiting features of ameloblastoma

b). Type 2 comprises of epithelial nodules arising from the cystic lining and projecting into the cystic lumen. These nodules comprised epithelium with a plexiform or follicular pattern resembling that seen in intraosseous ameloblastoma. In both of these types, the cyst lining shows features of ameloblastoma but often in focal areas, and there is no evidence of infiltration of the fibrous tissue wall by ameloblastoma

c). Type 3 is characterized by the presence of invasive islands of ameloblastomatous epithelium in the connective tissue wall of the cyst, and these islands may or may not be connected to the cyst lining

These types of lesions are usually painless and slow growing, which may expand the cortical plates and mostly erode them with invasion of adjacent soft tissue. These variants are found with equal sex predilection. The incidence ranges from 2nd to 5th decade of life.

CASE REPORT

A 38-year-old male patient was reported to our Department (oral & maxillofacial surgery), at Pacific Dental College & Research Centre, Udaipur with complaint of large painless swelling of the right mandible. Swelling was present since past 5 months and it was slowly increasing in size. There was no history of trauma. On Clinical examination represents gross buccal expansion from right body to angle region of the mandible (Fig. 1). Intra orally swelling extended from the lower right first premolar to 2nd molar region and which was found to be firm in consistency. There was no sign of paraesthesia on this region.

Fig .1: Extra oral swelling extending from right body to angle of mandible

Radiographic examination: OPG revealed a well demarcated radiolucent area involving the right body and angle region of mandible (Fig.2). It extended from the lower right first premolar region to the 2nd molar region of right side of mandible. the lesion involves root apices of the lower right first pre molar which appeared to be resorbed. On complete blood count examination, a mild raise in neutrophil counts was observed.

Fig. 2: Orthopantamogram showing well defined radiolucency at root apex from right second premolar to third molar region

An incision was made from second premolar to second molar region (envelope flap), flap was reflected exposing the lesion, that shows small perforations of the buccal plate of bone. Small bony window was created using round bur no.7. On exploration the cystic wall was ruptured which shows discharge of straw coloured fluid. Enucleation of cystic lesion done along with removal of half the buccal plate & peripheral osteotomy (Fig. 3). A freshly repared carnoy's solution was used to clean remanants of cystic lining (chemical cauterization), A freshly preprared iodoform soaked ribbon gauze was inserted into the bony cavity for secondary healing of cavity and partial closure done with 3-0 vicryl in order to retain iodoform gauze in socket. Iodoform ribbon gauze was replaced every 2nd week as the cavity formation of secondary granulation tissue and apparently healing well. After 45 days complete closure was done using 3-0 silk. At that time, on examination we found that the lower right second premolar was slightly mobile as a result of bucaal decortication done as a part of operative procedure during surgery and the root resorption that has taken place during cystic enlargement (preoperative). Patient was then referred to Department of Conservative & Endodontics for RCT in relation to 44 & 45. Right labial anaesthesia was present.

a) **b)**

Fig. 3: a). vestibular incision was placed from right second pemolar region to angle region of right side of mandible raising envelop flap; **b).** Enucleation of cystic mass along with extraction of involved tooth

As a result of soft tissue biopsy histopathological examination shows the cyst lined by the typical ameloblastomatous epithelium with a basal layer comprised of columnar cells. These layer conquered by a layer of cells with stellate reticulum-like features (Fig.4). On above mentioned features, Unicystic Ameloblastoma of the Mandible was diagnosed, On Post-operative follow ups the patient showed good progress in healing of bony cavity and the paraesthesia on involved side gradually resolved. Post operative radiographs, showed satisfactory bone healing by secondary intention and there was no sign of further progression of resorption of the roots of involved tooth, and after endodontic treatment, the associated tooth mobility drastically reduced and has been periodically reviewed for that. After five years of our follow ups there was neither any further symptoms on that site nor any sign of recurrences.
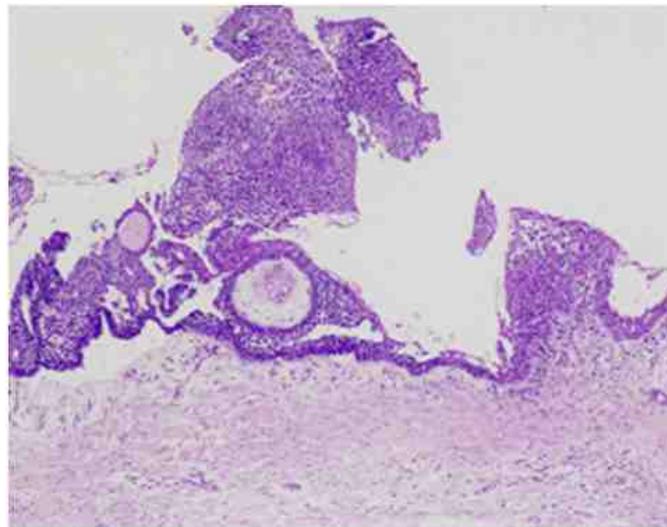

Fig.4: shows typical ameloblastomatous epithelium with a basal layer of columnar cells conquered by a layer of cells with stellate reticulum-like features

DISCUSSION

However, the radiographic features of the unicystic ameloblastoma is similar to its other variants and to primordial cysts. The unicystic ameloblastoma may attain considerable size with either multilocular or unilocular appearance. The border of the lesion is usually well-defined without any radiographic evidence of invasion into the surrounding bone. There may be often seen lesion with diffuse borders that represents a less favourable tissue response or faster growth of lesion.

Mural invasion can be difficult to detect unless serial sectioning of the specimen with thorough microscopic examination are performed to make an accurate diagnosis. The whole specimen needs to be actively screened for mural invasion in every case of unicystic ameloblastoma to determine the true prevalence of histological subtypes in any series. Until recently, the paucity of information in the literature probably reflected the difficulty in collecting the information on histological subtypes.

It is generally believed that the presence of tumour cells in the fibrous capsule of unicystic ameloblastoma, like in type 3 lesions, predisposes to recurrence after enucleation. The freshly prepared Carnoy's solution that comprised of: chloroform 3 ml, absolute alcohol 6 ml, glacial acetic acid 1 ml, ferric chloride 1 gm; act as a sclerozing agent for the chemical cauterization, after cyst enucleation, and also use today as a fixative. It can be concluded from this case report that after enucleation of unicystic ameloblastoma with mural invasion chemical cauterization with Carnoy's solution and peripheral osteotomy shows less recurrence of lesion. Recurrence can be attributed to other factors such as offending tooth is either not extracted or endodontically treated, in such cases lesion can recur after 2 to 4 years of treatment.

REFERENCES

1. Isaacsson G, Andersson L, Forsslund H, et al: Diagnosis and treatment of the unicystic ameloblastoma. Int .I Oral Maxillofat Surg 15:759, 1986

2. Abrams AM, Melrose RJ, Handlers JP: Unicystic ameloblastoma.J Calif Dent Assoc 18:76, 1990

3. Ackermann GL, Altini M, Shear M: The unicystic ameloblastoma: A clinicopathological study of 57 cases. J Oral Path01 17:541, 1988

4. El-Abdin H, Ruprecht A: Unicystic ameloblastoma in the Sudan.Int J Oral Maxillofac Surg 18:64, 1989

5. Kahn MA: Ameloblastoma in young persons: A clinicopathologic analysis and etiologic investigation. Oral Surg 67:706, 1989

6. Shirasuna K, Fukuda Y, Kitamura R, et al: Malignant schwannoma of the mandible. Int J Oral Maxillofac Surg 15:772, 1986

7. Raveh T, Neuman AR, Weinberg A, et al: Treatment of extensive malignant schwannoma of the mandibular nerve. Ann PlastSurg 34:637,1995

8. Elias MM, Balm AJ, Peterse JL, et al: Malignant schwannoma of the parapharyngeal space in von Recklinghausen's disease: A case report and review of the literature. J Laryngol Otol 107848, 1993

9. Regezi JA, Sciubba JJ: Oral Pathology: Clinical Pathologic Correlations (ed 3). Philadelphia, PA, Saunders, 1999, p 324

10. Olaitan AA, Adekeye EO: Clinical features and management of ameloblastoma of the mandible in children and adolescents. Br J Oral Maxillofac Surg 34:248, 1996

11. Reichart PA, Philipsen HP, Sonner S: Ameloblastoma: Biological profile of 3677 cases. Oral Oncol Eur J Cancer 31B:86, 1995

12. Olaitan AA, Adekeye EO: Unicystic ameloblastoma of the mandible: A long term follow-up. J Oral Maxillofac Surg 55:345, 1997

Artificial Intelligence – A Technological Revolution in Eye Disease Diagnosis

Dr. Virendra Singh Lodha

Professor Ophthalmology, Department of Ophthalmology,
Pacific Medical College and Hospital, Bhillo Ka Bedla, Udaipur, India

Abstract

Artificial intelligence (AI), considered the fourth major industrial revolution is progressing at a very fast pace to affect every aspect of life in the present era, including medical science. In near future it is likely to become a major tool in the diagnosis and management of diseases and to even predict future course of the diseases. This technology by using machine learning (ML) and deep learning (DL) techniques has shown reliable and accurate diagnostic efficacy by analyzing retinal images, optical coherence tomography (OCT) scans and visual field analysis and other patient data, in diseases like diabetic retinopathy, age related macular degeneration, retinopathy of prematurity, glaucoma and many other eye diseases.. The results provided are at par and comparable with the experts. This may prove to be a great telemedicine tool in screening patients for vision threatening diseases even in primary healthcare facilities and making referrals for patients who require intervention by a specialist.

This review describes the role of Artificial Intelligence in Ophthalmology and its current status.

Keywords:

Artificial Intelligence, Machine Learning, Deep Learning, Retinal Images, Visual field, OCT

Artificial Intelligence (AI), labeled to be the 4th major industrial revolution is a science for making machines smart to perform tasks automatically without human intervention like a self driving car. AI uses various techniques to make such tasks possible, Machine Learning (ML) and Deep Learning (DL) are the major ones. ML means ability of machines to learn to perform certain acts like making inferences and predictions through ML algorithms after data input, e.g., classifying emails as being spam / not spam. DL is a newer fast developing field, a type of machine learning based on deep neural networks to provide solutions such as object detection in images, speech recognition, language translation with high accuracy comparable or sometimes better than human mind.

Artificial Intelligence (AI) is becoming an important tool in medical science in diagnosis and management of diseases, drug interactions, telemedicine and monitoring of patient's status at home. AI has been shown to give better / at par conclusions and interpretations from imaging studies when compared to experts. AI in healthcare is the use of computer software by way of machine learning and deep learning through neural networks to analyse medical data and provide conclusions for a particular set of data which are comparable to human cognition (medical professionals), i.e. AI is an ability of a computer program to function like a human brain for a particular task from deep learning (DL) process. In medical field DL has been successfully applied to medical imaging analysis with strong accuracy in interpretation and diagnosis from radiological images, skin photographs and histopathology slides.1-4 With advancing digital technology all types of images including diagnostic imaging studies are stored in digital format which can be analysed pixel by pixel by deep learning algorithms to give accurate interpretation and diagnosis.

In ophthalmology DL is being successfully applied to ophthalmic imaging, mainly fundus photography (retinal images) and optical coherence tomography (OCT), for evaluation and diagnosis of diabetic retinopathy,[5,6,7] retinopathy of prematurity[8] glaucoma[5,9] and age related macular degeneration.[5,10,11] All these diseases require early diagnosis and treatment and long term follow up to prevent irreversible loss of vision. Screening and timely diagnosis of these common diseases which are increasing in incidence require a large number of specialists and financial resources in both, developed and developing countries. With the use of AI it may be possible to screen, refer and monitor patients in primary healthcare facilities by trained paramedical staff and results transferred to specialists for expert opinion and or treatment. Deep learning algorithms are being developed to predict future course of diseases.[12,13]

Diabetic retinopathy (DR)

With increasing incidence and life expectancy, 8.5% people over 18 years of age have diabetes in the world and are at a risk of potentially blinding diabetic retinopathy which has become a leading cause of vision loss all over the world. In India the prevalence of diabetes is estimated to be 10.9% - 14.2% in urban and 3.0 – 7.8% in rural population over 20 years of age, with a total of 72.96 million adults having diabetes.[14] The prevalence is fast increasing in rural population also who are not aware about retinopathy and also do not have access to ophthalmologist for regular screening for DR. In DR patient may not have symptoms in early stages of the disease and as the

DR progresses it may cause irreversible loss of vision. Hence it becomes important for a diabetic patient to have yearly fundus examination. AI with fundus camera with trained paramedical staff may help in screening and diagnosing DR in early stages and timely referral to specialist for treatment, thus saving the vision. With the help of AI a large number of patients can be screened even in rural areas and benefitted by timely referral to retina specialist for treatment.

Idx Technologies was the first company to get approval from U.S.F.D.A. for its AI diagnostic device, Idx-DR for clinical use to detect diabetic retinopathy.[15] IDx-DR is a cloud server based software which analyses fundus images taken with a fundus camera and provides two types of results: (1) "more than mild diabetic retinopathy detected: refer to an eye care professional" or (2) "negative for more than mild diabetic retinopathy: rescreen in 12 months."

It has been found in a study conducted at Google that general ophthalmologists are less accurate than AI software and retina specialists are not significantly more accurate than AI in diagnosing DR. The efficiency of general ophthalmologist increases with the help of AI and that of retina specialist improves. In future it may even become possible to predict the course of severity of DR in a particular patient and identify such patient who is likely to have higher risk of vision loss and starting treatment before vision loss occurs.[12]

An algorithm developed by Google for diabetic retinopathy and diabetic macular oedema has been tested and is in use at Aravind Eye Hospital, Madurai, India.[6]

Age related macular Degeneration

Age related macular degeneration (AMD) is a major cause of vision loss in elderly population all over the world. It is estimated that >280 million persons may develop ARMD by 2040.[16] Again it requires a large number of ophthalmologists to screen population for AMD and monitor the disease course in people diagnosed and undergoing treatment. DL systems have been developed using Age Related Eye Disease study (AREDS) data for screening and diagnosis of AMD so as to refer them for specialist care. A diagnostic accuracy of 88.4% to 91.6% have been reported using DL system in the diagnosis of AMD.[10]

Optical coherence tomography (OCT) technique has greatly improved the diagnosis and management of macular diseases especially diabetic macular oedema (DMO) and AMD. Moorfields Eye Hospital and Google's Deep Mind Health have developed an AI system which can diagnose fifty types of retinal pathologies including choroidal neovascularisation (CNV), Macular oedema without CNV, drusen, geographic atrophy, epiretinal membrane, vitreomacular traction, full thickness macular hole, partal thickness macular hole, central serous retinopathy and normal.[17] It has been found that performance of this system is at par with experts and can be used by independent practicing optometrists for screening of patients and timely referal.[18]

Glaucoma

Glaucoma is an optic neuropathy due to loss of axons resulting in glaucomatous cupping and erosion of neuroretinal rim. Primary open angle glaucoma is evaluated by measuring intraocular pressure, visual field analysis (VFA), fundus photographs and OCT of optic nerve head and retina. AI and DL programs have been developed to detect glaucomatous damage using fundus photographs and OCT images.[9, 19] Similarly programmes have been developed to interpret VFA and detect glaucomatous changes with high sensitivity and specificity comparable to that of clinicians.[20,21]

Retinopathy of prematurity

Retinopathy of prematurity (ROP) is one of the major causes of childhood blindness and the incidence of ROP is increasing with better healthcare facilities and increased survival rate of premature children. Trained personnel may not be available to screen all premature children in developing countries and rural areas, in such places digital fundus photography and

telemedicine and AI techniques can be of great help in screening for ROP. AI software have been developed for screening of ROP from fundus images with high diagnostic efficacy.[22]

Other diseases

AI based computing has been shown to diagnose and predict progression of refractive errors in children.[13]

DL based software have been developed to predict cardiovascular and stroke risk from analysing fundus photographs.[23,24]

Approval of AI techniques for clinical use

In United States AI system called IDx-DR has been approved for testing for diabetic retinopathy and is being offered at CarePortMD, the retail health clinics at Albertsons grocery stores, the second largest grocery store chain in United States.[15,25]

Challenges – Though AI, DL and machine learning techniques are developing at a very fast pace but most of these models have been developed using data from developed countries with different ethnic populations and geographies, it remains to be tested whether these models provide equally reliable results in populations all over the world. Medico legal aspects and regulatory laws are different in different countries and will require to be considered.

AI, machine learning and DL is progressing at a very fast pace in the field of ophthalmology and will be a major contributing technology in the screening and management of major causes of blindness the world over and particularly in developing countries where super speciality facilities like retina and glaucoma are available in large cities only, the number of which is not enough to examine every diabetic patient for DR or to examine all suspects of other retinal diseases. These techniques if become affordable may of great help to general ophthalmologist and optometrists to triage for presence of retinal pathologies and make referrals for selected patients, in developing countries like India.

CONCLUSION

The AI enabled data processing in healthcare is advancing at great speed and has achieved a level where it can diagnose and predict future course of a disease accurately by analysing digital data from imaging studies and electronic health records.

In future the DL algorithms can give reasons also (The WHY) for arriving at a particular diagnosis. This technology will help in screening population for potentially vision threatening diseases like DR, glaucoma, AMD, ROP and many others at an early stage by using fundus camera and OCT. The prevalence of these diseases is increasing the world over and it is not possible to physically examine every person likely to develop these diseases. For eye diseases a large population can be screened by fundus camera even at a primary healthcare centre /by general ophthalmologist or optometrist and result transferred by telemedicine to the concerned expert or facility for treatment if required. This will lead to reducing workload on tertiary eye care centres and specialists by screening and referring only selected patients who require an

intervention to prevent vision loss and help reducing prevalence of irreversible vision loss especially in developing countries like India.

Financial Support and sponsorship –

Nil

Conflict of interest

There are no conflicts of interests.

REFERENCES

1. Lakhani P, Sundaram B. Deep learning at chest radiography: automated classification of pulmonary tuberculosis by using convolutional neural networks. Radiology 2017;284:574-82.

2. Ting DSW, Yi PH, Hui F. Clinical applicability of deep learning sysyem in detecting tuberculosis with chest radiography. Radiology 2018;286:729-31

3. Esteva A, Kuprel B, Novoa RA, et al. Dermatologist-level classification of skin cancer with deep neural networks. Nature 2017;542:115-18

4. Ehteshami Bejnordi B, Veta M, et al. Diagnostic assessment of deep learning algorithms for detection of lymph node metastases in women with breast cancer. JAMA 2017;318:2199-210

5. Ting DSW, Cheung CY, Lim G. et al. Development and validation of deep learning System for diabetic retinopathy and related eye diseases using retinal images from Multiethnic populations with diabetes. JAMA 2017;31

6. Gulshan V , Peng L , Coram M , et al. Development and validation of deep learning algorithm for detection of diabetic retinopathy in retinal fundus photographs. JAMA 2016;316:2402-10

7. Gargeya R, Leng T. Automated identification of diabetic retinopathy using deep learning. Ophthalmology 2017;124:962-9

8. Brown JM , Campbell JP, Beers A , et al. Automated diagnosis of plus disease in retinopathy of prematurity using convolutional neural networks. JAMA Phthalmol 2018;136:803-10

9. Li Z , He Y , Keel S , et al. Efficacy of a Deep Learning System for Detecting Glaucomatous Optic Neuropathy Based on Color Fundus Photographs. Ophthalmology 2018;125:1199-206

10. Burlina PM , Joshi N , Pekala M , et al. Automated grading of age-related macular degeneration from color fundus images using deep convolutional neural networks. JAMA Ophthalmology 2017;135:1170-6

11. Grassmann F , Mengelkamp J , Brandl C , et al. A deep Learning Algorithm for Prediction of Age-Related Eye Disease Study Severity Scale for Age-Related Macular Degeneration from Color Fundus Photography. Ophthalmology 2018;125:1410-20

12. Arcadu F, Benmansour F, Maunz A, et al. Deep learning algorithm predicts diabetic retinopathy progression in individual patients. npj Digit. Med. 2019;2:92 doi:10.1038/s41746-019-0172-3 N2.

13. Varadarajan AV, Poplin R, Blumer K, et al. Deep Learning for Predicting Refractive Errors from Reinal Fundus Images. Invest Ophthalmol Vis Sci 2018 June1;59(7):2861-8

14. Tandon N, Anjana R, Mohan V, et al. The increasing burden of diabetes and variations among the states of India: the Global Burden of Disease Study 1990 - 2016 The Lancet Global Health 2018;(6)12:1352-62

15. https://www.fda.gov/news-events/press-announcements/fda-permits-marketing- artificial-intelligence-based-device-detect-certain-diabetes-related-eye

16. Wong WL , Su X , et al. Global prevalence of age-related macular degeneration and Disease burden projection for 2020 and 2040: a systematic review and Meta-analysis. Lancet Glob Health 2014;2e106-16

17. De Fauw J , Ledsam JR , Romera-Paredes B , et al. Clinically applicable deep learning for diagnosis and referral in retinal disease. Nat Med 2018;24:1342-50

18. Buchan JC , Amoaku W , Barnes B , et al. How to diffuse a demographic time bonb: The way forward ? Eye 2017;31:1519-22

19. Christofer M , Belghith A , Weinreb RN , et al. Retinal nerve fiber layer features Identified by unsupervised machine learning on optical coherence tomography scans predict glaucoma progression. Invest Ophthalmol Vis Sci 2018;59:2748-56

20. Li F, Wang Z, Qu G, et al. Automatic differentiation of Glaucoma visual field from non-glaucoma visual field using deep convolutional neural network. MMC Med Imaging 2018;18:35

21. Andersson S, Heijl A, Bizios D, et al. Comparison of clinicians and an artificial neural network regarding accuracy and certainity in performance of visual field assessment for the diagnosis of glaucoma. Acta Ophthalmol 2013;91:413-7

22. Campbell JP, Ataer-Cansizoglu E, Bolon-Canedo V, et al. Expert diagnosis of plus Disease in retinopathy of

prematurity from computer-based image analysis. JAMA Ophthalmol 2016;134:651-7

23. Poplin R, Vardarajan AV, Bluumer K, et al. Prediction of cardiovascular risk factors from retinal fundus photographs via deep learning. Nat Biomed Eng 2018;2(3):158-64

24. Benny Z, Jack L, Quing L, et al. Stroke Risk Assessment for the Community by Automatic Retinal Image Analysis Using Fundus Photograph. Quality in Primary Care 2016;24(3):114-24

25. AI Screening for Diabetic Retinopathy Moves to Retail Clinics – Medscape – Nov 26, 2019, www.medscape.com

PMCH
HEALTH ADVISORS