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Word limit :

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Times New Roman, 12 size, single spacing.

MUHURAT LSCS : A MODERN SUPERSTITION

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Introduction

Muhurat : The dictionary meaning of muhurat is an auspicious time for an enterprise to begin or for a ceremony to convene. It is the most sought out moment for marriage to ensure maximum compatibility between spouses for their happy life ahead. Applying muhurat to planned event is a well-established culture, but planning a 'natural' event as per the muhurat becomes exorbitant. A strong belief that celestial bodies have alleged power over modulating human fortune is prevalent. Ergo, the muhurat delivery by caesarean section (LSCS)!

Date: Eleventh November two thousand and eleven. Does this number strike a chord? Let me try expressing it in figures 11/11/2011 or precisely 11/11/11.... Certainly this number with so many 1s doesn't sound like any mundane date! Lots of elective cases and unindicated LSCS were done on this date with the assumption that babies born on this date would be number 1 in whatever they do!! To add to the *VIP*ness of the date was the fact that our former dear Miss India/World and then Mrs Bachchan also had her expected date of delivery in the same month. Everybody speculated that she would undergo an elective LSCS on the 'auspicious' date. And they were not completely to be blamed, as she (Aishwarya) was forced to marry a tree before she could wed so that the flaws (दोष) in her *kundali* (horoscope) would be eliminated. So it was a journey from a 'superstitious' marriage to an 'auspicious' delivery for her. Fortunately, (or unfortunately) she delivered on some other day...



Muhurat LSCS : The Concept

What exactly is a “muhurat LSCS”? I respect ancient Indian mythology and have great regards for astrology. The argument here is not whether astrology is a science/a fiction/ or a superstition. Perhaps our concern is whether we can control astrological influences on human being as a human being. Well the present circumstances force me to believe so! Generally, astrology works by predicting future of the baby based on date/time of birth. But in today’s world, the astrologers have reverse engineered this and they now predict an auspicious date/time for birth. There is no way one can totally avoid destiny that has already been determined for the child to be born. It really is absurd that people are letting their sentiments rule over practical and scientific belief and not letting nature take its natural course. Astrology vehemently propagates that the time of birth grants newborn an obligatory adherence to destiny. When the LSCS is inevitable due to some medical reasons, probably in that case it can be done in consonance with muhurat. But doing LSCS that is unindicated merely to have the child born on some ‘auspicious’ time is not only illogical but also unethical. Astrology is at best a theory of probability and hence can never be totally correct. Certain serious and awkward events can be missed or misinterpreted. To the believer, fetus in the gravid uterus is just like the Schrodinger’s cat; albeit lacking randomness.

Pregnant woman should understand what they are signing up for when they choose to undergo a LSCS for muhurat baby. The saddest part is the mothers do not have much say in this, it is the rest of the family that decides. At times such families cause lot of ruckus if operation theatre is unavailable at the desired muhurat. Nevertheless, the doctors’ plight is more ghastly in these circumstances than it appears to be. Not only the delivery team (obstetrician, anaesthetist and neonatologist) are called at uncanny hours but they are also forced to operate at a dictated pace so as to deliver the baby at a predetermined time. We, as doctors, have to surmount the induction-delivery and incision-delivery time on several occasions. Needless to say, such practices jeopardize the mother and the unborn baby. Risks associated with any other major surgery are present with LSCS along with known complications like inexorable uterine bleeding.

Given the fact that Indians believe in astrology since ancient times, one may wonder why there is a sinister rise in muhurat LSCS only recently. Young couples these days are earning well, so the expenditure for medical procedures becomes relatively immaterial to them. Healthy life, longevity, marital harmony, prosperity and domestic peace of the offspring are the biggest motivating factors making couples opt for muhurat LSCS. But at times, the indications are quite credulous, e.g., if the child is born on a particular time, it would be a fair skinned boy! As a matter of fact, how can the time of delivery decide the gender of the baby which is scientifically determined at the time of conception itself! Interestingly, there are methods in astroscience involving copulation techniques to have desired progeny as well. What seems plausible about such prognostication now depends on the knowledge we have today. In fact, the incidence and distribution of traits and their correlation to celestial ordering of planets at the time of birth could be the subject of excellent prospective or still better a retrospective observational study. The prerequisite however would be to have clearly defined variables and presence of a control group.



Mother, Doctor & the Muhurat

The other reason for increasing muhurat sections presently is that young mothers of today have a preconceived notion about the birth process and they straight forward decide to opt for a LSCS, the risks of which are never explained to them by anyone. On the contrary, the astrologers claim that LSCS will be a painless and complication free procedure. This misconception has to be broken and maternal-child health should be given the prime importance. Less known fact is that astrology does not fall under the purview of the Drugs and Magical Remedies Act, hence one cannot object the advertisement by astrologers. Nevertheless, their theories have been impugned by the scientific experiments many times. Doctors have nothing against the science of astrology but there being no medical evidence to prove its impact on child birth, subjecting a parturient to unwanted surgery will always be considered immoral. Parents-to-be need to realize that LSCS is a major surgery and by doing it when not indicated endangers both the mother and fetus. Therefore, basic education about normal labour amongst young couple is vital. The role of anaesthetist becomes pivotal here. While the obstetricians could allay the anxiety regarding the vaginal delivery and emphasize the safety of the process, assurance can be given by the anaesthetist who may offer the facility of painless labour and sensitize the mother for vaginal birth.

Finally, the couples who are opting for muhurat LSCS should take time to analyze if their decision is worthwhile. Following questions may help them to reconsider their decision:

1. The astrologer is a human being and none of the stuff is scientifically proven yet. Can we rely on his prophecy?
2. Does the astrologer claim his prediction to be foolproof?
3. Is it ethical to put the unborn baby and the mother through the risk of an unwanted surgery?
4. Is the freedom/right to choose being used in the right way?
5. Who actually is getting benefitted by the muhurat LSCS?

Conclusion

To conclude, medical decision of LSCS is best left to the doctors. One should not let superstition triumph over science. A level headed approach and team work is required to overcome the madness of muhurat LSCS.

Footnote: All figures are taken from google search. Excerpts on data is acquired from web and news; copyright of these remains with the original publisher. A part of this write-up was published in a souvenir by Indian Society of Anesthesiologists.

Note :

Editorial Correction

*It has come to the attention that Review Article printed in Volume 1, No. 2 August 2020 issue. Otolaryngology practice in the setting of COVID 19 pandemic correct senario & future perspectives By Dr. Netra Pathak & Dr. Kiran Shinde **Second Author Dr. Kiran Shinde's Name was not printed in the article.***

Artificial intelligence in Pathology

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Abstract

Increased interest in the opportunities provided by artificial intelligence and machine learning has spawned a new field of healthcare research. The new tools under development are targeting many aspects of medical practice, including changes to the practice of pathology and laboratory medicine. Optimal design in these powerful tools requires cross-disciplinary literacy, including basic knowledge and understanding of

critical concepts that have traditionally been unfamiliar to pathologists and laboratories. This review provides definitions and basic knowledge of machine learning categories (supervised, unsupervised, and reinforcement learning), introduces the underlying concept of an important foundation in supervised machine learning, and we briefly discussed what and how different AI models of ML (Machine Learning) are used in various subspecialty of pathology.

List of terms and abbreviations appearing in this paper

Abbreviation	Term	Explanation
AI	Artificial intelligence	Intelligence represented by artificial things
ML	Machine learning	Data-driven statistical learning approach to AI
CNN	Convolutional neural network	Neural network suitable for data with locality, e.g. image
AUC	Area under receiver operating characteristic curve	Performance measure based on the area under the receiver operating characteristic curve, varying from 0.5 (lowest) to 1.0 (highest)
DL	Deep learning	Deep neural network based ML

Artificial intelligence in Pathology – A review article

Pathology is the study and diagnosis of disease through the examination of body tissue, which is typically fixed on glass slides and viewed under a microscope. Most medical diagnoses are made by pathologists, who, as consultants to physicians, are often referred to as “The Doctor’s Doctor”.⁽¹⁾ In this digitalized era, pathology also evolved from glass side to whole slide scanned image (WSI), and its continuously evolving with time and now, it’s time for artificial intelligence. Post covid pandemic many things have been changed and pathology is also not an exception. AI is on the door and knocking hard.⁽²⁾

Artificial intelligence (AI) is considered as the next natural progression of traditional statistical techniques. Advances in analytical methods and infrastructure enable AI to be applied in health care. While AI applications are relatively common in fields like ophthalmology and cardiology.⁽³⁾ During the last decade, Artificial intelligence (AI)

is having an increasing impact on the field of pathology, as computation techniques allow computers to perform tasks previously performed by people.⁽²⁾⁽⁴⁾

The aim of this review is to : (a) provide an overview of the AI application process in pathology; (b) provide brief descriptions of select advanced Machine Learning (ML) algorithms; (c) present the current status of AI in research toward pathology.

What is AI?

Artificial intelligence (AI) is a broadly encompassing term, coined by McCarthy et al.⁽⁵⁾ There is no universal definition of AI, but central to most definitions is the ability of a learning system to mimic human behavior. Artificial intelligence (AI) denotes the intelligence presented by some artificial entities including computers and robots.⁽³⁾ AI is an umbrella term that brings together concepts from several fields such as computer science, statistics, algorithmic, ML, information retrieval, and data science at large.

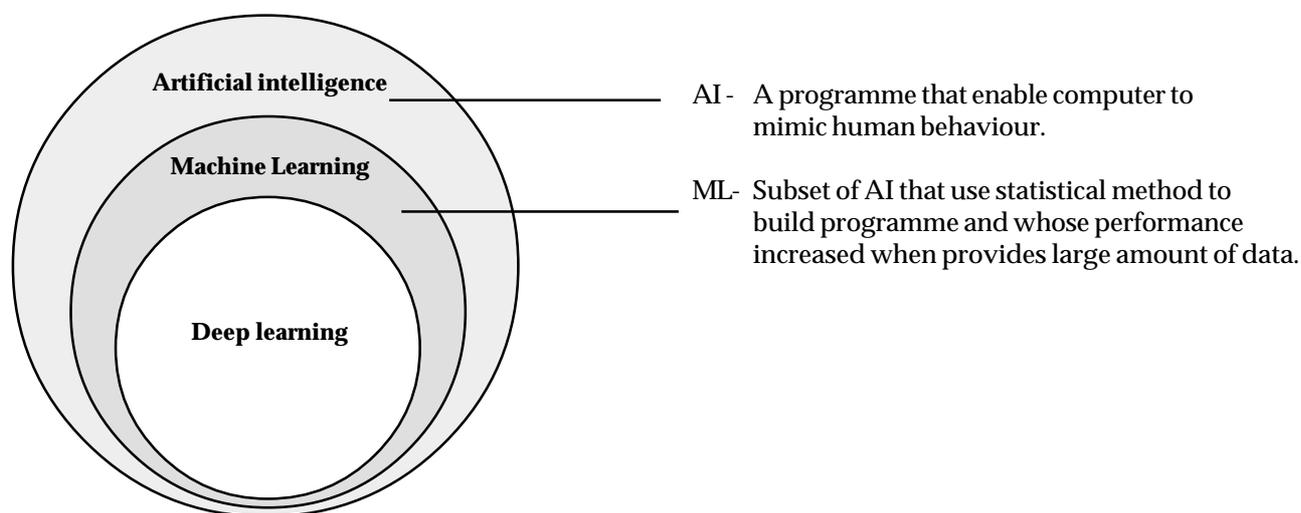


Figure1 - Shows the relationship between artificial intelligence (AI), machine learning (ML), and deep learning (DL). ML is a subset of AI and DL is a subset of ML. ML is a sub-discipline of AI that uses training examples of how to perform a specific task without explicit instructions to identify associations for a given outcome measure. DL is a subfield of ML that mimics neural networks to learn⁽⁶⁾

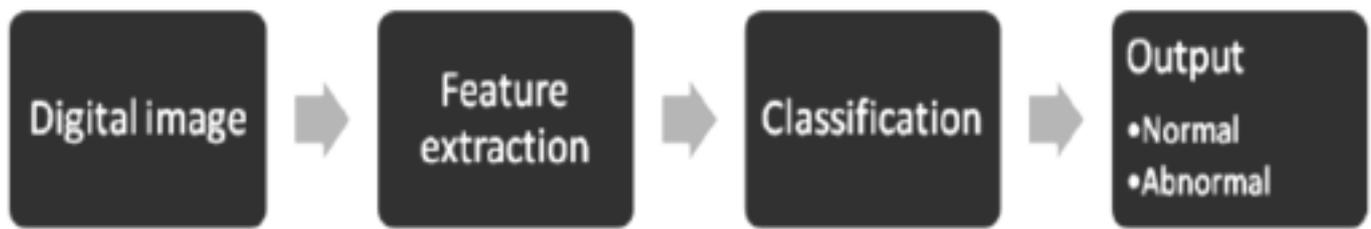


Figure 2 - Machine learning involves algorithms that parse data, use hand-crafted features to statistically learn from that data, and then apply what was learned to make a prediction or decision.

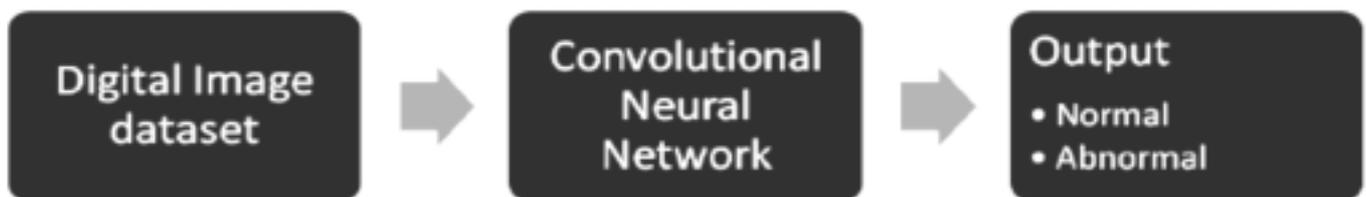


Figure 3 - Deep learning requires large amounts of data and uses a layered convolutional neural network with an input, many hidden, and an output layer that can program itself to make intelligent decisions on its own.

Types of AI(2)(7)

Strong AI	Narrow AI
An implementation of AI that can solve general problems. A strong AI may be a collection of narrow AIs working together.	Also known as weak AI, an implementation of AI that can only perform narrow sets of tasks.

What is ML?

Field of science where computers are used to develop and implement mathematical models and algorithms to perform a task without explicit instructions.⁽²⁾

Types of ML

The types of ML techniques that currently exist for building AI applications broadly fall into three families (Figure 2), namely supervised learning (SL), unsupervised Learning (UL), and reinforcement learning (RL).⁽⁸⁾

Supervised learning(2)(3)

Examples of supervised learning algorithms are artificial neural networks, decision trees, k-nearest neighbors, and linear regression. Supervised learning is the most frequently used type of ML. The objective of SL is to build a predictive model that takes historical input features to predict a specific output. Supervised learning can be divided into two categories (classification and regression) depending on the type of the output. Classification models are used to identify which category an input belongs to (eg, adenocarcinoma verse squamous cell carcinoma). Regression models are

used to determine what output value an input data value should be assigned for continuous dependent variables (eg, predicting a patient's length of stay in a hospital).

Unsupervised learning(8)(3)

Unsupervised learning is not about predicting a specific output. Instead, the algorithm attempts to identify patterns or groupings within the data. UL techniques usually focus on clustering, dimensionality reduction, or anomaly detection. Enabled researchers to generate analytic models in cases where there is a lack of ground truth. Cluster analysis only describe the features and patterns of the data; this is analogous to the identification of a new classification of a tumor by noting it is sufficiently morphologically different from other tumors.(2) Dimensionality reduction techniques, are for simplifying a predictive model to its most important inputs.using this model one

could can find find the top laboratory tests predictive of the presence or absence of a given disease.For instance, while fasting glucose and hemoglobin A1C would likely be found to be highly associated with having diabetes, the 2 values are highly correlated; if one has a hemoglobin A1C, a fasting glucose value adds little to our predictive power. A well designed dimensionality reduction algorithm might then prefer another laboratory test than fasting glucose that has less direct correlation with hemoglobin A1C.

Reinforcement learning (8)(3)

Reinforcement learning is a newer class of learning and represents a hybrid of supervised and unsupervised learning. In reinforcement learning, the algorithm maximizes accuracy by trial and error. Most of the applications of RL are in the fields of board and video games and beyond the scope of this paper.

Table No-1- Over view of machine learning algorithms, types of ML and examples. (9)(2)(3)(7)

Type of ML	Goal	Input Data	Output data	Example
SL	Predict Outcome	Labelled data	1. Classification (discrete & qualitative) Input data --> output is class	Classify tumour adenocarcinoma verses squamous cell carcinoma
			2. Regression (discrete & quantification) input data --> output is Number	Predicting a patient's length of stay in a hospital

Type of ML	Goal	Input Data	Output data	Example
UL	Identify patterns and grouping	Unlabelled data	1. Clustering (descret) Input data --> to find input regularities	Identification of a new classification of a tumor by noting it is sufficiently morphologically different from other tumors
			2. Dimensionality reduction (continuous) Input data--> to find out the best lower dimensional representaiion	Find the top laboratory tests predictive of the resence or absence of a given disease.
RL	Optimize prediction by trial and error	Mix data	Hybrid of supervised and unsupervised learning	Video games

(SL- Supervised Learning, UL- Unsupervised Learning, RL- Reinforcement Learning)

Application of AI in pathology

Main objectives of AI are to develop training system and reporting system for pathologist ,improving efficiency of pathologist workflow and construction of novel classification system combing with pathology diagnosis, prognostic data, and massive data/images.(4)Most pathology applications of AI are in relatively early development.

There are only a few FDA-approved devices that use AI, and these support cervical cytology screening and blood/fluid cell classification.(7)The application of AI in pathology generally fall into the following main categories(4)

Table No. 2 - Over view of use of AI in Pathology.

Prognostic / predictive application	<ol style="list-style-type: none"> Survival and outcome prediction based on WSI finding alone Or in combination with other clinicopathological variables. Response to adjuvant and neoadjvunt therapies. 	Predict prognosisGuide strategy for treatment and better outcomes
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Diagnostic application	<ol style="list-style-type: none"> 1. Improving pathology service workstream. 2. Quality control 3. Prioritizing the workflow. 4. Automatic requests of biomarkers. 5. LN examination and metastasis detection. 6. Remote reporting. 7. Automated quantification of IHC staining. 8. Multidimensional output (morphology, grade, stroma, microenvironment, LVI) 	<ol style="list-style-type: none"> 1. Efficient for pathology services workflow. 2. Cost effective, time saving for pathologist and increasing accuracy
Educational application	<ol style="list-style-type: none"> 1. Patholgy training. 2. Automated annotations. 3. Facilitate trainees and BMS reporting of cases. 	Help / support training trainee and junior pathologist.
Integration of other data	<p>Genomic data</p> <ol style="list-style-type: none"> 1. NGS data 	Provide specific molecular information with good clinical correlations.

(AI, artificial intelligence; IHC, immunohistochemistry; LN, lymph node; LVI, lymphovascular invasion; NGS, next-generation sequencing; SNP, single nucleotide polymorphism; WSI, whole slide image.)

Keluo et al (2) divide application of AI in two broad categories, image related and non image related fields.

To avoid confusion we are discussing the use of AI in pathology in broadly four categories, anatomic pathology, cytology, hematology and blood banking and genetics.

AI in anatomic pathology

The International Symposium on Biomedical Imaging has hosted the CAMELYON (Cancer Metastases in Lymph Nodes) first challenge in 2016. Aim was to evaluate new and existing algorithms for the automated detection of metastases in Hematoxylin and Eosin stained whole slide images of lymph node sections. Challenges like this boosted the AI all over the world.(4)(10)(2) In research settings, machine learning has been used successfully to classify and grade lung cancer, predict prognosis in lung and

brain cancer, classify colorectal polyps, diagnose and classify lymphoma, measure breast tumor proliferation, identify metastases in lymph nodes, predict bladder cancer recurrence, diagnose and grade prostate cancer, and identify tumor stroma. Many research articles are available on AI application in pathology.(7)

Romo-Bucheli et al. (11) developed a CNN to identify tubules of breast cancer. They tested their deep learning model on WSIs of 174 patients and found that the CNN-based tubule formation score was associated with the corresponding Oncotype

DX and tumour grade risk categories in ER+ breast cancer.

Serious efforts have been made to adopt deep learning in prostate cancer pathology. The automated Gleason grading is one of the most active fields in computational pathology. Arvaniti et al. used 641 TMA (Tissue Micro Array) images of prostate cancer to train CNN algorithm for automated Gleason scoring. In the test TMA cohort of 245 patients, the CNN application showed comparable inter-observer agreement with that of occurred between the 2 ground truth pathologists. Furthermore, the CNN model's Gleason score assignments significantly stratified patients into groups with distinct disease-specific survival.

Moreover, this prognostic potential was superior to that of pathologists scoring. (12)

In the study by Nirschl et al.the authors developed a CNN application to detect clinical heart failure from HE stained endomyocardial biopsies. Biopsy sections from 104 patients were used for training and samples from 105 patients for independent testing. Their CNN model achieved an AUC of 0.97 in detecting heart failure on HE WSI outperforming the two participating pathologists' readings (AUC: 0.75)(13)In another study done by Wei et al., (mentioned in table no .3) on duodenal biopsy HE images to distinguish coeliac disease, nonspecific duodenitis and normal tissue.(14)

Table No.3-Over view of machine learning algorithms, used in different studies.

Specimen type	Image analysis details	Algorithm performance	Authors	Model performance
Prostate Cancer	Image analysis details Predict molecular profile: Detect SPOP mutation status on HE slides	Deep learning – CNN	Schaumberg et al. (15)	Model achieved an AUC of 0.74 and 0.86 in two independent cohort
Gastric and Colorectal Cancer	Predict molecular profile: Detect microsatellite instability mutation status on HE stained FFPE and frozen sections	Deep learning – CNN	Kather et al. (16)	Patient level AUCs ranged between 0.69 and 0.84 in five independent cohorts
Melanoma	Predict disease-specific survival from HE slides	Deep learning – CNN with segmentation	Kulkarni et al. (17)	Model achieved an AUC of 0.880 and 0.905 in two independent cohorts

Specimen type	Image analysis details	Algorithm performance	Authors	Model performance
Pancreatic neuroendocrine tumour (NET) [82]	Automatically distinguish NET and nontumour regions on Ki67 stained biopsies	Deep learning – CNN	Niazi et al. (18)	Model showed 97.8% sensitivity and 88.8% specificity against pathologists' classification
Ovarian Cancer	Automatically classify different ovarian cancer types on HE slides	Deep learning – CNN	Wu et al. (19)	Accuracy of classification was 78.20%
Cervical Cancer	Automatically classify cervical cells into abnormal and normal categories on Pap smear and liquid-based cytology	Deep learning – CNN	Zhang et al. (20)	Classification accuracy and specificity was 98.3%, AUC was 0.99
Coeliac Disease	Automated classification of coeliac disease, nonspecific duodenitis and normal tissue on HE stained duodenal biopsy	Deep learning – CNN	Wei et al. (14)	Model achieved slide-level AUC greater than 0.95 for all the three diagnostic classes

In future applications may calculate scores such as Ki-67 automatically, identify tumor area, count items on slides (tumor-infiltrating lymphocytes, mitoses, organisms, inclusions), predict cancer genetics and prognosis from histological sections, identify regions of greatest interest on a slide, and triage cases based on slide content.(2)(7)(4)

Use of AI in Hematology & Blood Banking (8)(21)(22)

There are various algorithm and models use in research field since 2015, in hematology to

facilitate pathologist in the field. Alternating decision tree model was used in 201cases to predict mortality on day 100 in post HSCT patient. After that, many models are in market and tried for various reason. Recently in year 2020 convolutional network model was used on images of slides stained by H&E, for Histology-based classification of DLBCL versus Burkitt lymphoma.

Checking appropriateness of blood transfusion for quality assurance required enormous usage of time and human resources from the healthcare system. Yao et al(22) reported that a new machine learning algorithm for checking blood transfusion

quality. They conclude that Machine learning algorithm can accurately match to human judgement by feeding in pre-surgical information and key laboratory variables.

Use of AI in immunology and genetics

Stafford et al (23) did a systemic review on use of AI in autoimmune disease. Most of the models used for clinical outcome and survival prediction in patient of Multiple sclerosis, Rheumatoid arthritis, inflammatory bowel disease etc. but no single study was using only pathology as a single variable. Rather they approached through clinico immunological data. So still there is scope for pathological approach in the autoimmune disease.

Identifying the association between morphological features and tumor genetic profiles or predicting the underlying molecular alteration based on the morphological features appears to be a successful and easy approach(4) Some of these changes can predict specific mutations within the cell. This has been demonstrated for prediction of SPOP mutation in prostate cancer, BRAF in melanoma, and six of the ten most common mutations in lung adenocarcinoma. Other examples include the prediction of consensus molecular subtypes in colorectal cancer and microsatellite instability.(24)

The highly multiplexed nature of NGS has helped to alleviate some of the problems associated with traditional Sanger sequencing, namely cost, reaction time and sensitivity to low-frequency variants. At the moment, NGS data pipeline have standardization and quality control issues and ML methods can be potential solutions.(2)

Use of AI in cytology (Gynecology & Non Gynecology)

Automating screening of the Papanicolaou's smear was an obvious initial target for the

application of machine learning. One of the first commercially available automation assisted systems designed for this purpose was PAPNET. It was developed by Neuromedical Systems Inc., (NSI) and was introduced around 1992.(25) The purpose was to detect cervical epithelial abnormalities missed on prior manual microscopic examination of conventional Papanicolaou smears. One of the main lessons learned from the PAPNET experience was that rescreening negative cases for only modest improvements in sensitivity was not a strong enough value proposition to entice laboratories to purchase an expensive system .(10)

Bao et al(25) concluded in their study that, AI-assisted cytology system could exclude most of normal cytology, and improve sensitivity with clinically equivalent specificity for detection of CIN2+ compared with manual cytology reading. Overall, the results support AI-based cytology system for the primary cervical cancer screening in large-scale population.

Thyroid pathology has great potential for automated/artificial intelligence algorithm application as the incidence of thyroid nodules is increasing and the indeterminate interpretation rate of fine-needle aspiration remains relatively high. Girolami et al. (26) did a review on image analysis and use of AI in thyroid pathology. Savala et al(27) conclude that ANN model is efficient to diagnose follicular adenoma and carcinoma cases on cytology smears without any error.

Fine needle aspiration cytology (FNAC) for identification of papillary carcinoma thyroid is a moderately sensitive and specific modality. Study conducted by Sanyal et al(28), assessed the performance characteristics and limitations of the neural network, assuming FNAC diagnosis as gold standard. Combined results from two magnifications showed good sensitivity (90.48%), moderate specificity (83.33%), and a very high negative predictive value (96.49%) and 85.06%

diagnostic accuracy. However, vague papillary formations by benign follicular cells identified wrongly as papillary carcinoma remain a drawback.

When Dey et al(29) applied an artificial neural

network to FNA smears of histology proven breast lesions, their algorithm was able to differentiate all of the benign and lobular carcinoma cases and the majority of ductal carcinoma cases. Other non gynecology studies are mentioned in the table no.4.

Table No 4 - Over view of machine learning algorithms , use in different studies in cytology.

Specimen type	Image analysis detail	Algorithm performance	Authour
	Feature-based model (k-nearest neighbor) based on chromatin distribution metrics.	Distinguished malignant mesothelioma from benign mesothelial cells with 100% sensitivity and specificity.	Tosun et al. 2015(30)
Pleural effusions	Feature-based model (classification and regression trees) for distinguishing benign and malignant endometrial lesions.	Distinguished malignant from benign cases with a sensitivity of 72.1% and specificity of 90.7%.	Pouliakis et al. 2014(31)
Endometrium	Convolutional neural network trained on exfoliative and fine needle aspirate specimens from lung cancers into adenocarcinoma, squamous cell carcinoma, and small cell carcinoma.	71.1% accuracy.	Teramoto et al. 2017(32)
Lung	Described a method to identify Mycobacterium tuberculosis in Ziehl-Neelsen stained slides using color segmentation and shape extraction.	Authors report that the algorithm successfully detects most single bacilli, while overlapping bacilli are labeled as “possible.”	Sadaphal et al.(10)
Pancreatobiliary	Deep neural network (single shot multibox detector).	Distinguished benign from malignant pancreatic FNA with 80% sensitivity and specificity of 80%.	Hashimoto et al. 2018(33)

AI in pathology training and education(4)

Integration of AI tools in the reporting workflow can provide trainees with additional information such as lists of differential diagnosis and potential auxiliary tests that can be requested, the level of difficulties and subjectivity of the diagnosis of the lesion and the relevant educational resources which potentially improve their training.

Limitations and future perspectives

Although current results have shown convincingly that in some tasks AI can match the performance of human experts, AI still entails limitations and there are numerous challenges remaining. Model interpretation might also reveal new hallmarks of a disease, such as the histological presence of edema in gliomas that has not been previously recognized as an unfavorable marker, but was detected by AI (34)

Recent results have demonstrated that current AI models, when trained on too small data sets, even using meticulous, pixel-wise labels can present a 20% drop of performance when tested on independent data sets (35)

Any new test to be implemented into clinical practice is subject to regulation. The new conformite Europe ene – in vitro diagnostic device regulation (CE-IVDR) from 2022 will significantly affect the European laboratories, which is going to require further clinical evidence defined by Notified Bodies in addition to the existing requirements of self-validation and certification route.

Indian AI system is though in developing phase we also need some regulatory laws laid down by authority to control trials and use of it.

However, we expect the clinical uptake might be slowly evolving as (i) costs for setting up digital slide scanner, image storage, maintenance contracts, image analysis software and IT support systems are substantial; (ii) AI applications have to be demonstrated to be robust and safe in a large population representative and blinded cohorts

with detailed clinical follow-up, and also validated prospectively on consecutive cases in a pathology department over a set period of time; (iii) Furthermore, defining the minimal level of performance that AI models would have to achieve for pathologists to accept using them is an issue that has not been addressed yet.

Concluding remark

As the need for personalized care increases, we face an urgent demand for more accurate biomarker evaluation and more quantitative histopathologic cancer diagnosis to aid and improve therapy decisions. Pathologists need to be equipped with new methodology and tools to deliver the needed diagnostic sensitivity and specificity, and it now seems certain that artificial intelligence is the next step towards precision pathology.

Conflict of interest

The authors did not receive financial or any other support whatsoever in the experimental work or in the preparation of their manuscript.

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A rare case of Cavernous Hemangioma of Maxillary Sinus.

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Abstract

Hemangioma are benign lesion of vascular origin. Though haemangioma of nose is a common tumor, those arising from the paranasal sinuses are not very common. But hemangioma in the maxillary sinus is relatively rare. Hemangioma of the maxillary sinus should always be considered as a differential diagnosis for lesion in the maxillary sinus.

Very few cases have been reported. Because of its rarity under the backdrop of existing literature we are reporting our present case. There are two histological types of hemangiomas according to the microscopic size of the blood vessels. This study reports a case of cavernous hemangioma on maxillary sinus.

Keywords :

Cavernous hemangioma, epistaxis, hemangioma, maxillary sinus, paranasal sinus

INTRODUCTION

Hemangiomas, the commonest vascular lesions of the head and neck, are slow-growing benign pseudotumoral vascular anomalies, or hamartomas, and are of capillary, cavernous, mixed and proliferative types. Although the face, scalp, orbit and oral cavity are mostly affected in the head-neck region, involvement of the nasal cavity and paranasal sinuses is very rare. The majority of the sinonasal hemangiomas are of

capillary variety, usually seen in childhood in the septum and vestibule,^{1,2} and the less common cavernous type,³ generally encountered in adults with a female preponderance,⁴⁻⁸ characteristically involves the lateral nasal wall.⁴ Such hemangiomas can arise from the bone, mucosa or submucosa,¹ and very few cases of non-osseous (mucosal) variety of cavernous hemangioma originating from the maxillary sinus are reported in the indexed medical literature. Only 5 out of the 85 cases described by

Fu and Perzin had vascular lesion of maxillary sinus. Hemangioma of the maxillary sinus should always be considered as a differential diagnosis for lesion in the maxillary sinus. Their origin is uncertain. There are two histological types of hemangiomas according to the microscopic size of the blood vessels. This study reports a case of cavernous hemangioma on maxillary sinus. This case is reported because of rarity of its presentation

Case presentation

A 9 years old girl, presented with longstanding, left sided nasal obstruction and serosanguinous nasal discharge. She had been experiencing nasal obstruction and intermittent epistaxis for one year already. Her past medical history was otherwise unremarkable. On anterior rhinoscopy, pale white polypoidal mass seen occupying whole of the right nasal cavity. Turbinates were not seen separately. The CT scan obtained following intravenous contrast administration revealed a large, inhomogeneously enhancing mass in the left maxillary sinus and nasal cavity (Figures 1). The nasal turbinates and the medial wall of the maxillary sinus had been eroded by the mass. There was also a bony remodeling in the anterior wall of the maxillary sinus.

The MRI showed a heterogeneous high-signal intensity mass on the T2-weighted images (Figure 2). When enhanced with gadolinium it seemed to arise from the antrum of the maxillary sinus and extended into the left nasal cavity, through the ostiomeatal complex. Because of the suspicion of sinonasal cancer, a biopsy was taken to obtain tissue from the nasal cavity and maxillary sinus. However, the biopsy revealed multiple submucosal dilated vessels filled with blood, fibrin deposition and organized thrombi stain for fungal organism negative, findings consistent with hemangioma. The microscopic examination showed dilated sinusoidal vascular channels in the stroma lining

with an interconnecting fibrous wall covered with flat endothelium. The Lumina of these spaces were filled with blood.

The tumor was completely excised by performing endoscopic sinus surgery with the patient under general anesthesia. (Figure 3) No significant hemorrhage occurred during the surgery, and the surgical findings were well correlated with the CT imaging. However, the uncinate processes as well as the medial wall of the maxillary sinus were found to have been destroyed by the mass. The histologic features were most compatible with cavernous hemangioma (Figure 4). On follow up after 1 year, the patient was asymptomatic, without any sign of recurrence.

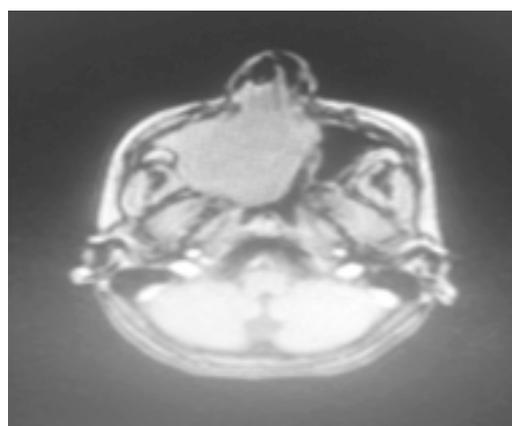


Fig 1 : CT SCAN

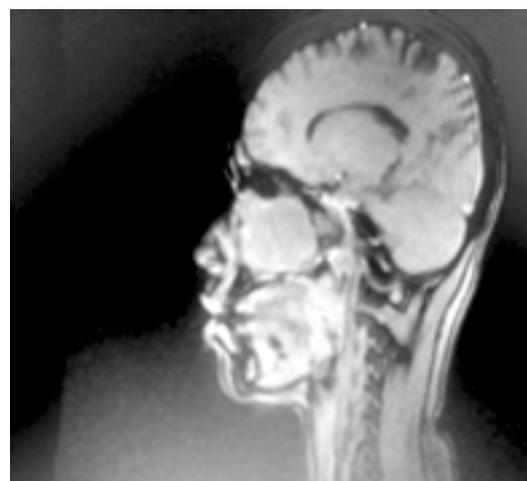


Fig 2 : MRI SCAN

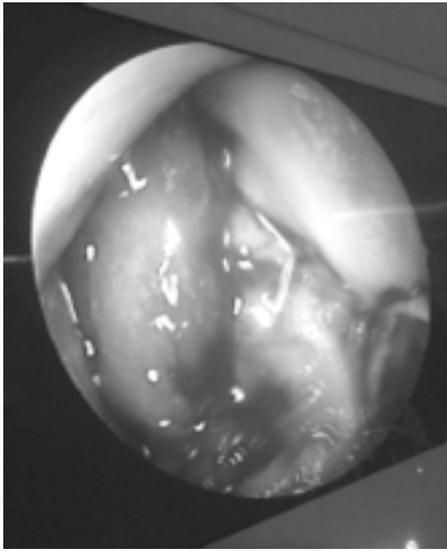


Fig 3 : ENDOSCOPIC VIEW OF NASAL MASS

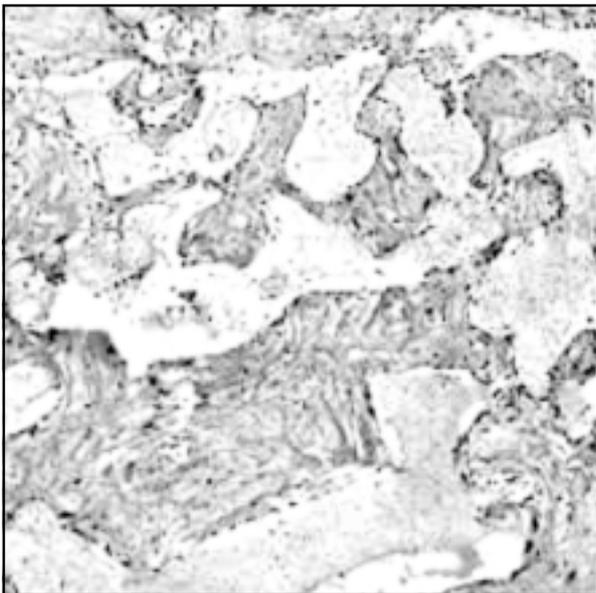


Fig 4 : HPE Suggestive of Cavernous Haemangioma

Discussion

Hemangiomas of the head and neck are benign vascular lesions, and although they are common in these locations, they occur infrequently in the paranasal sinuses. Hemangiomas are divided into capillary and cavernous types, depending on the

dominant vessel size seen on microscopic examination. Capillary hemangioma is the more common type and is composed of capillary-sized vessels lined with flattened epithelium.

Cavernous hemangiomas rarely involve the nose and paranasal sinuses, with only a handful of isolated case records that describe them especially in relation to the maxillary sinus and lateral nasal wall.⁴⁻¹¹ They are often asymptomatic,⁹ or present as reddish, polypoid or sessile mass causing nasal obstruction or recurrent epistaxis with a predilection for young persons, especially women, in their second and third decades.⁴⁻⁸ Other presenting symptoms could be rhinorrhea, facial swelling and bulging of the eye.

Considering the scarcity of cases and dearth of narrative reviews, there is no generalized clinical picture or uniform management protocol for maxillary cavernous hemangiomas, thereby increasing the chance of misdiagnosis, and as a result, unpredictable bleeding during interventions.

Cavernous hemangiomas are composed of large, endothelium-lined vascular spaces. The common symptoms of the sinonasal hemangiomas include nasal obstruction, epistaxis and occasionally a visible nasal mass. Although there have been multiple clinical studies of nasal hemangioma, only less than 20 cases of maxillary hemangioma have been reported.

The radiographic appearance of hemangiomas has been reported in the literature. Previously reported CT features of maxillary sinus hemangioma can be summarized as depicting a highly vascularized, soft-tissue mass. Although several enhancing portions have been noted on CT scans, even larger areas did not enhance because of necrosis and hemorrhage within the tumor. Furthermore, Hemangiomas have been reported to cause changes in adjacent bone.

Clinical condition will depend on the site and size of lesion. The main clinical features are:

persistent epistaxis and nasal obstruction. Capillary hemangiomas can be asymptomatic or when affecting the nose, they are called “bleeding polyps”. These ones can present either as a red polypoid lesion or sessile nodular mass of progressive enlargement, causing nasal obstruction or epistaxis at any trauma¹.

Opposing to that, cavernous hemangiomas are baldy defined lesions regarding depth and are usually subcutaneous. The current patient presented recent repetitive epistaxis, though did not present nasal obstruction or any other correlated symptoms

According to Dillon et al⁵ capillary Hemangiomas of the nasal vault had benign appearing bone changes, consisting of remodeling or expansion. Kim et al⁶ reported two cases of cavernous hemangioma that caused erosion of the wall of the maxillary sinus, nasal turbinate and orbit. According to Weiss et al⁷ amorphous or curvilinear calcification is a non-specific finding, whereas phlebolith formation is a more specific finding of cavernous hemangioma. In our case, CT also showed a soft tissue mass, which caused expansile bone remodeling of the maxillary sinus, with a small calcification within the lesion, similar to previously reported CT findings. We therefore, assume that this CT finding offers a diagnostic clue regarding the presence of a hemangioma. According to Itoh et al⁸ MR images of cavernous hemangioma reflect the signal of unclotted blood and they have prolonged T1 and T2 relaxation times, which result in low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. However, these lesions do not show any of the signal voids associated with the hypervascularity, often seen in other types of vascular malformation. Dillon et al reported that, on T2-weighted sequences, capillary hemangioma of the nasal vault shows a hypointense rim surrounding a mass of mixed signal intensities. Pathology examination revealed that these signals

were apparently correlated with areas of clotted blood.

Organized hematoma (OH) is the most difficult lesion to differentiate, both clinically and radiologically, from sinonasal cavernous hemangioma. Although Yagisawa et al. suggested that hemangioma and sinonasal OH are the same pathologic entity; the fact that the vascular Lumina of cavernous hemangioma are usually larger than those of OH on histologic examination still raises the question of the probability of the different nature of the two lesions. In addition to OH, mucocele, fungus ball, inflammatory polyp, cholesterol granuloma, inverted papilloma, and carcinoma can present as an expansile mass. Contrast material administration is useful because mucocele, fungus ball, polyp and cholesterol Granuloma are not usually enhanced. Carcinoma has a pattern of nodular enhancement.

The surgical resection is the main treatment for maxillary sinus hemangioma. According to tumor extent, different surgical resection methods can be used for maxillary sinus hemangioma, such as lateral rhinotomy, the Caldwell-Luc operation or endoscopic sinus surgery. Preoperative transarterial embolization can decrease the tumor size and reduce the risk of hemorrhage during surgery⁹⁻¹¹ Catheter angiography may be useful to delineate these lesions and for pre-operative embolization and surgical planning

Conclusion

Mucosal cavernous hemangiomas of the maxillary sinus/lateral nasal wall are truly rare though well-described entities; understanding their clinicopathologic profile would help identify these benign neoplasms as one the chief differential diagnoses of sinonasal neoplastic mass that presents mostly in young patients with nasal obstruction and epistaxis.

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Conflicting interest: NIL

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Reverse Rotation of Gut With Hiatal Hernia of Stomach – A Rare Anomaly.

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INTRODUCTION -

During development due to abnormal rotation of gut, transverse colon get fixed behind the superior mesenteric artery leading to intestinal obstruction or narrowing of the descending colon or dilatation of ascending colon and cecum. Reverse rotation and abnormal fixation accounts for only 2-3% cases of malrotation and it is common in female. Intestinal obstruction is a common surgical emergency in such cases

CASE REPORT-

During routine dissection of 70 year old female cadaver hiatal hernia type I ;sliding hernia was found . Part of stomach along with gastro-esophageal junction was present in the thorax. In the abdomen, transverse colon was behind the superior mesenteric artery(SMA) and duodenum was intraperitoneal and in front of SMA. Narrowing of the left transverse colon,descending

colon and significantly sigmoid colon was present. Dilatation of mainly cecum was observed.

Mesocolon was short and almost completely fused with posterior abdominal wall for right transverse colon and absent for left transverse colon; making mobilization impossible for it. Many adhesive bands were present for both large and small intestine. Relative positions of other structures were normal along with the relation of superior mesenteric artery and vein with each other. Position of cecum and ileocecal junction was normal.

AIMS AND OBJECTIVES-

To discuss embryological basis of transverse colon lying behind superior mesenteric artery and part of stomach in thorax and relation between them.

DISCUSSION-

Congenital hiatal hernia which is the rarest appearance and may be associated with

renal, cardiac and other chromosomal anomalies(1). Malrotation is uncommon but is seen in 42% of cases of congenital diaphragmatic hernia(2). Incidence of reverse rotation which is stated by many authors in their papers may be less as many live asymptomatic life and remain either unnoticed or detected at the time of autopsy.

At 4th week of gestation fusion of septum transversum and pleuroperitoneal membranes form diaphragm(3). Pleuroperitoneal canal if not closed at 8 to 10 weeks of gestation results in herniation of abdominal contents into thorax as midgut loops start returning and fixing in to abdomen at the same time . Another type of diaphragmatic hernia, esophageal hernia, is thought to be due to congenital shortness of esophagus(4). Here in present case, cause for sliding hernia might be failure of muscle developing from myoblast originating from somites from cervical segments three to five C3-5. Several intra-abdominal organs like stomach, small bowel, spleen, omentum, colon and kidney can migrate through the diaphragmatic defect.

Normally rotation of gut starts at 4 -5 weeks of gestation; due to large size of liver, mesonephric kidney and rapid growth of the midgut, gut herniated into extraabdominal cavity in sagittal plane , which is known as physiological herniation of the midgut. Further elongation of this umbilical loop is associated with anticlockwise 90° rotation (viewed from front) of mid gut around the axis of the superior mesenteric artery (SMA) , resulting in prearterial segment lying on right side in a horizontal position. Between 8 to 9 weeks of development; an additional 90° degrees anticlockwise (viewed from front) rotation occurs so prearterial segment is caudal and postarterial segment is cranial while returning back to abdominal cavity and elongation of prearterial segment occupies posterior and central position in abdomen as by this week; liver reduced in size and further growth of abdominal cavity gives space for elongated and coiled prearterial loops to fix back[4,5] and further 90° anticlockwise rotation of postarterial segment occupies position below liver.

As a result of this, the prearterial segment which forms duodenum acquires a position posterior to the SMA, jejunal coils on the left-sided and the cecum which is last to return acquires a right-sided position. After normal midgut rotation: the jejunum and transverse colon are in an intraperitoneal position and duodenum is mostly in a retroarterial position.

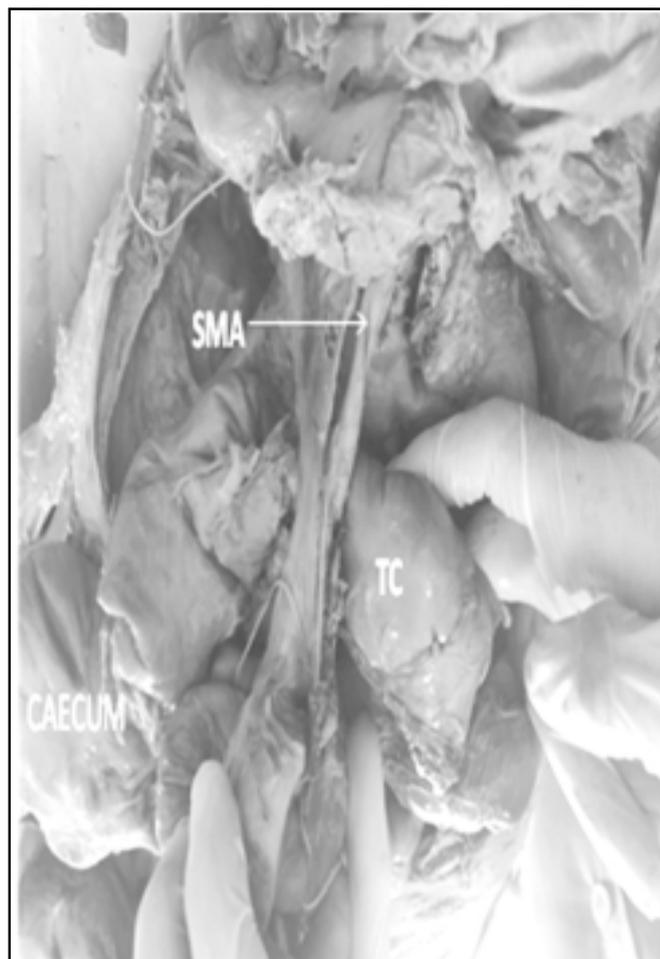
In our case; reverse rotation may be explained I) on the basis of first 90° clockwise rotation instead of anticlockwise (viewed from front) prearterial segment on left and postarterial on right; followed by 90° anticlockwise so coming back to normal position ; postarterial segment taken back behind SMA and prearterial in front of SMA OR

II) reverse rotation may be explained on the basis of net 90° clockwise rotation (viewed from front); 90° anticlockwise while herniating and further 180° in clockwise direction leading to net 90° clockwise. Further postarterial segment probably returns back to the right first. same can be explained while herniating and further 180° in clockwise direction leading to net 90° clockwise. Further postarterial segment probably returns back to the right first.

In 1883 reversed intestinal rotation was first reported by Tscherning (6). Dott (7) in 1923, suggested that a net 90 degrees clockwise rotation caused when the initial 90 degrees anticlockwise rotation of the umbilical loop is followed by an 180 degrees clockwise rotation. Postarterial segment returning first to the right behind the axis which is SMA and prearterial segment which forms duodenum and jejunum returning later to the left so lying in front of SMA.

CONCLUSION-

Considering superior mesenteric artery as axis of rotation; reverse rotation of gut leads to transverse colon lying behind the artery and duodenum lying in front of the artery. Such cases may be asymptomatic though can present as intestinal obstruction or volvulus as surgical emergency.



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Management of a case of left upper limb gangrene, post covid infection, with hypertension, acute kidney injury under interscalene block.

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Background :

Multiple and unimaginable ailments are seen lingering in the post covid period. On-going problems include fatigue, shortness of breath, myalgia, mental confusion, tachyarrhythmias, and involvement of the lungs, kidneys, and brain. The virus has the distinct features, including its propensity to cause widespread inflammation and blood clotting, this could play a role in the assortment of concerns now surfacing. Reporting herewith a case of Gangrene of the forearm which slowly developed 4 months after recovering from Sars COV 2 infection ultimately requiring amputation.

Introduction:

Surviving Covid 19 has been only a part of triumph for some patients. The initial months of the pandemic were devoted to saving patients lives and prevention of transmission at that time and after effects were barely seen. But now over 12 months into the pandemic these can no longer be

ignored. Incubation time of COVID 19 is up to 14 days. Typical clinical symptoms include fever, dry cough, sore throat, fatigue, diarrhea, conjunctivitis, hyposmia, and hypogeusia. Diagnosis is based on medical and travel history, contact to COVID 19 patients, and clinical symptoms.(1) SARS Cov2 virus most commonly affects the respiratory system but in a small group of patients it may affect the heart, brain and may also increase the risk of long-term health problems and life-threatening complications. Physicians have tried their level best to extrapolate and anticipate long term effects of covid. We are in the middle of an epidemic of severe illness so therefore there is an epidemic of severe illness that is likely to follow. Initially it was thought to affect primarily the lungs but now it has been found that it also causes capillary endothelial damage and activation of the coagulation cascade and persistent elevation of blood makers of inflammation as observed in severely ill patients Few cases showed microthrombi with small and patchy evidence of tissue death caused by blockage

of some major blood vessels as was seen in our patient. The optimal screening for patients after recovery from covid 19 is unknown. Prophylactic therapies to prevent long term complications may be appropriate as the burden of the disease is found to be increasing.

Case description :

A 52 years old female patient known case of hypertension since last 10 years with deranged renal function presented to the emergency room of a tertiary care centre with gangrene of the upper limb and severe hypotension. On admission BP-70/50mmHg, she was resuscitated and admitted in surgical unit. Patient suffered from covid 19 infection 3 months ago, with mild symptoms and was home quarantined for the same. She tested negative after 14 days and had completely recovered from the infection. Three months later she developed throbbing pain followed by blackish discoloration of left hand that worsened gradually over the past one month as shown in fig 1.



FIG 1 : Image showing Gangrene of the left forearm.

A detailed history was taken about her symptoms, complications, medications & ICU admission in view of she being in post covid state. Pre-anaesthetic evaluation was done. She was obese weighing 96kg, and had short neck, heavy chest and jaw and difficult airway was anticipated. On enquiry during detailed history taking she revealed that she had complaints of claudication of left upper limb for the past many years. Being from low socio economic status she never got any evaluation done. Last month she had severe pain, she doesn't remember any trauma there, but her condition deteriorated after she tried hot-water fomentation. She agreed that she neglected early signs of necrosis and landed up with gangrene. She didn't give typical history of Reynauds phenomena but the likelihood of peripheral vascular disease should be kept in mind. Most likely because covid is associated with microthrombi formation or intravascular coagulation & DIC it could have precipitated her peripheral vascular disease. A provisional diagnosis of this being covid related arterial thrombo-embolic occlusion was made and coagulation profile was planned and PT-INR was advised. Pre-op investigations were advised. She was septicemic with neutrophilic leukocytosis with haemoglobin 10g/dl. Renal profile was deranged with BUN of 102mg/dl, creatinine 3.4mg/dl, electrolytes were normal, ABG was advised which showed compensated metabolic acidosis. ECG, LFT, PTINR normal. All reports were within normal range. Physician and pulmonologist reference was advised and she was posted for Emergency amputation to remove the septic focus. Upper limb Doppler revealed complete occlusion of the brachial artery downwards with no flow visualised on the left side. Right limb showed normal circulation. Post Covid artery occlusion is a serious complication especially when there was no other cause that could be attributable. Given the mysterious illness named Covid and the constellation of systems affected by the disease a

complication like this appeared dreadful. This in the light of reports of loss of vision in few patients post covid from retinal artery occlusion increased the fear manifold. To add to this she had changes on the chest X-Ray, most likely of fibrotic origin so HRCT was planned but could not be done. Ventilator and ICU was kept as standby for postoperative monitoring as general anaesthesia was initially planned, because it was better to have patient unconscious, so as to save the patient from the psychological trauma as guillotine amputation was planned. Difficult airway was anticipated. On table trans-thoracic echo was done to rule out any thrombus as 2Decho could not be done in the pre-operative evaluation, no thrombus was visible. Incision planned was well below the surgical neck of humerus. She was a high risk case for general anaesthesia because of her obesity, short neck, deranged renal function test and recent recovery from covid, considering the pulmonary involvement and sequelae in covid, even though patient tested negative with no CT scan report, thus intubation was avoided. Therefore a decision for interscalene block was taken. A USG guided block avoided any vascular puncture as patient was not totally evaluated for coagulopathy. Vasodilatation after Brachial plexuses block is also helpful in restoring the circulation to the amputated limb as shown in fig 2 was planned.



Fig 2 : Showing USG guided block

The goal of this block was to place the needle in the tissue space between the anterior and middle scalene muscles and inject local anesthetic until the spread around the brachial plexus was documented by ultrasound. The volume of the local anesthetic and the number of needle insertions were determined during the procedure. USG guidance helped for visualization of the spread of the local anesthetic and additional injections around the brachial plexus if needed to ensure an adequate spread of local anesthetic, improving block success. The ability to visualize local anesthetic spread and to inject multiple aliquots also helped for a reduction in the volume of local anesthetic required to accomplish the block. The brachial plexus at the interscalene level was seen lateral to the carotid artery and internal jugular vein, between the anterior and middle scalene muscles. The prevertebral fascia, superficial cervical plexus, and sternocleidomastoid muscle were seen superficial to the plexus. The transducer was moved in the proximal-distal direction until two or more of the brachial plexus elements were seen in the space between the scalene muscles. Vasodilatation after BPB is also helpful in restoring the circulation to the amputated limb. Block was given with 12 ml of bupivacaine 0.5% there was small sparing on the medial aspect for which local infiltration with 6 ml 0.5% bupivacaine was used. She had surgical anesthesia at the site of incision. Propped up position given to ease her breathing. For sedation, Dexket mixture was given Pulse-100/min BP-110/80mm Hg, ECG was normal. A bag mask was held for oxygenation to prevent tongue fall due to the heavy jaw and short neck and was maintained on spontaneous respiration. Difficult intubation cart with a supraglottic airway devices was also kept ready. Total surgical time 1 hour, 50mcg Dex and 60 mg ketamine were given over this period. Patient tolerated the surgery well. Surgeon was happy to see a conscious and awake patient post operatively. Paracetamol was given for

analgesia Thus we could successfully manage a complicated case of difficult airway in an obese patient with acute kidney disease with limb gangrene in the post covid state .

Discussion:

In the initial days of the pandemic it was learnt that SARS-CoV-2 virus could cause disruption in a various tissues in the body .Exactly like a lock and key mechanism SARS-CoV-2 uses spike protein on its surface to latch onto cells' ACE2 receptors (2).These receptors are present abundantly in the respiratory tract , heart, gut, kidneys, blood vessels, and nervous system and hence , are vulnerable to COVID-19. Disseminated intravascular coagulation which is a state of hypercoagulation with laboratory findings such as increased levels of D dimer, fibrinogen and fibrinogen degradation products, and prolonged prothrombin time may be seen in patients with severe infection who may present with acro ischemia of finger and toe cyanosis, cutaneous bullae, and dry gangrene (3). Livedo like features and necrosis was seen in 6% of elderly COVID 19 patients, mortality rate of 10% was seen in patients with the above findings(4) Two more similar cases were reported in a 47 year old woman and a 67 year old male from Atlanta, USA (5)

Compared to the usual respiratory virus this Sars CoV2 virus has behaved predictably unpredictable there is diminution of immunity, long-term fatigue, headaches, vertigo, difficulty with cognition, and cardio-respiratory fitness. This disease can cause a lot of cellular level damage. Health workers who had recovered from COVID-19 to return to work complained of myalgia, weakness and fatigue. Various autopsy studies have shown the pathophysiology of COVID-19, justifying the novel treatment plans, including the anticoagulation strategies being put into effect by clinical leaders (6). Most patients recovery completely within few weeks only few people

including patients with mild symptoms may continue to suffer for months after their initial recovery .Long-term effects can occur even in those patients who were asymptomatic but had RT –PCR test positive. Elderly patients with diabetes and hypertension are more prone to suffer long term complications even children and the young who had milder versions of the disease are reporting persistent symptoms. Telephone survey of symptomatic adults who had a positive test result was advised by WHO and it was found that 35% had not returned to their usual state of health when interviewed 2–3 weeks after testing. Among those 18-34 years in good health, 20% reported that some symptoms were prolonged

Conclusion:

There are still some unknown facts about COVID-19 infection. Just like other entities with acute cardio vascular injury, there is likely to be a diverse response, depending on the mechanism of microtrombi formation , severity of acute illness, therapy delivered, hemodynamic response, host factors, immune-mediated factors, and post recovery care and follow-up We are currently facing a pandemic unseen in our lifetime with potential long-term cardiovascular complications. Now is the time for action to plan, thorough follow up and appropriate investigations with the hope and promise to mitigate these long-term sequelae.

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A Case of Persistent Trophoblastic Neoplasia Invasive Mole.

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ABSTRACT

Invasive moles are responsible of most cases of localized gestational trophoblastic neoplasia (GTN). Invasive mole is a condition where a molar pregnancy, such as a partial hydatidiform mole or complete hydatidiform mole, invades the wall of the uterus with potential for malignant transformation. We report a case of invasive vesicular mole. Patient presented with 3 months of amenorrhoea, on evaluation diagnosis of complete vesicular mole was done patient managed with Dilatation & evacuation. Further monitoring showed rising trend of beta hCG & further investigations confirmed the diagnosis of invasive mole. Hence managed aggressively with cytotoxic drugs & patient had complete remission within 3 months of treatment.

INTRODUCTION

Gestational trophoblastic disease (GTD) involves both benign and malignant entities that include vesicular mole (complete and partial),

choriocarcinoma, invasive mole, epithelioid trophoblastic tumor (ETT) and placental site trophoblastic tumor (PSTT). Incidence is maximum in Asia and South America and least in US. Maximum incidence is in Philippines (1 in 80). In India it is 1 in 400 pregnancies.(1,2) With a prior complete mole, the risk of another mole is 0.9 percent, and with a previous partial mole, the rate is 0.3 percent(3).

CASEREPORT

23year old,gravid 2,abortion 1 had reported to out patient department with history of 3 months of amenorrhoea without any complaints, for registration.Her last menstrual period was on 14-10-2019, with gestational age of 12 weeks.Obstetric history-gravid 1 - medical termination of pregnancy done 6 months back, gravid 2 - present pregnancy.

She was averagely built with body mass index of 19 kg/m², her vitals were stable. No pallor, no thyroid swelling palpable. Cardiovascular

&respiratory system had no abnormality. On per abdomen examination abdomen was soft no guarding, rigidity or tenderness,14week uterus palpable.On per speculum examination cervix & vagina was healthy, minimal altered coloured discharge noted. Per vaginal examination uterus was 14 weeks, anteverted, soft,bilateral fornix were free & non tender, cervical os was closed. Patient was postulated for routine labs along with obstetric dating scan.

All lab reports along withsr TSH(serumthyroid stimulating hormone) was within normal limits, obstetric USG (ultrasound sonography) was suggestive of mixed echogenic content with variable sized cystic changes, suggestive of vesicular mole (Fig.1). As diagnosed case of vesicular mole further investigations advised to her. Her sr beta hCG (serum beta human chorionic gonadotropin), Liver function test with enzymes, chest x ray doneher beta HCG level came >2,25,000mIUother above mention investigations were in normal limits.Fitness for anaesthesia was taken as patient was planned for dilatation &evacuation. According to modified WHO score for Gestational Trophoblastic Neoplasia her score was 6 (low risk). Patient & relatives counselling was done about the condition, requirement for serial beta hCG monitoring & progression to the malignant potential of the condition.

Planned dilatation&evacuation was done on 06-01-2020 under general anaesthesia, productsgrossly appeared as grape like vesicles (Fig.2),were sent for histopathological examination. Procedure was uneventful. USG done to confirm complete evacuation done. Following which after 7 days patient was asymptomatic, clinically stable with Sr beta hCG was 41,614mIU. On histopathological examination complete mole was confirmed (Fig.3). After 7 days again Sr beta hCG was repeated which showed 53,945mIU suggesting rising trend.

Due to rising trend of beta hCG repeat

hemogram, coagulation profile, liver function test with enzymes, chest x ray & repeat USG was done. Her USG was suggestive of locally invasive mole with increased vascularity. Repeat counselling of relatives was done in view of requirement of cytotoxic drugs Patient was started on alternate days of Inj.Methotrexate 40 mg intramuscular& Inj.leucovorin 0.4mg intramuscularfor 5 doses. After 7 days repeat beta hCG done,level turned out be raise with value of61,173mIU. Onco physician reference along with MRI (magnetic resonance imaging) pelvis was planned.MRI pelvis was suggestive of persistenttrophoblastic disease-invasive mole (Fig.4- heterogenous enhancing lesions invading myometrium near fundus of uterus with increased vascularity). Inj.Actinomycin 0.4mg IV5 days with continuing Inj.Methotrexate 40mg intramuscular continued till total 8 doses as advised by onco physician. Following which her beta hCG values showed falling trend on further monitoring of 25,765mIU, 7049mIU. Last value wastaken telephonically as patient lost follow up due to COVID lockdown situation after 45 days which was 2mIU (Fig.5). Patient wascounselled the importance of use of contraception for 3months.



Fig.1 - SNOW STORM APPEARANCE USG.

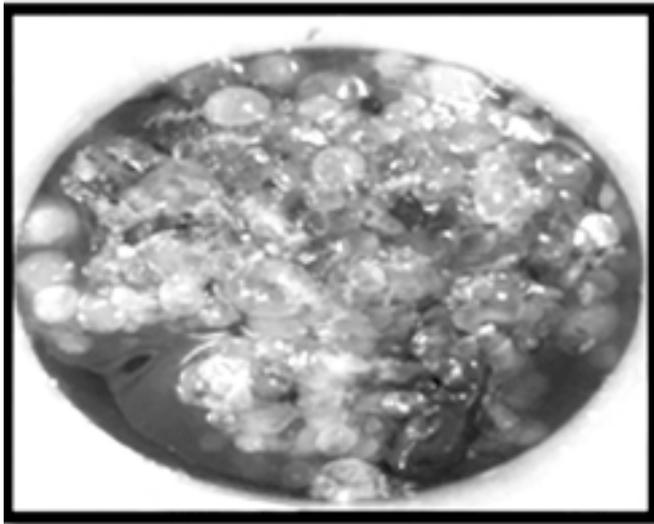


FIG. 2 - GROSS APPEARANCE GRAPE LIKE VESICLES.

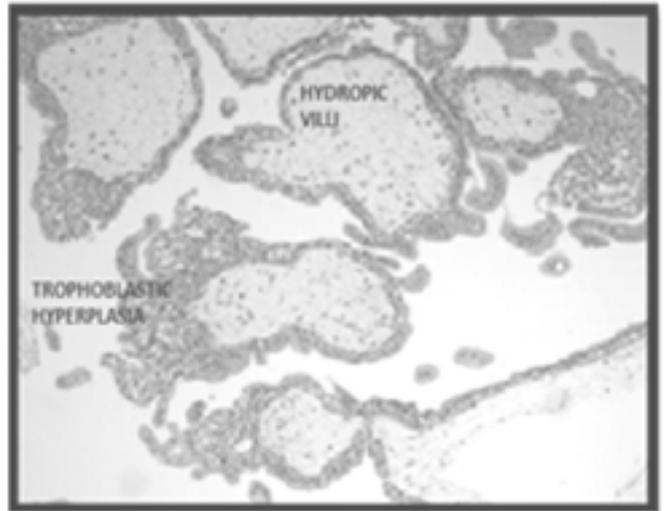


Fig. 3 - HISTOPATHOLOGICAL APPEARANCE - COMPLETE MOLE.

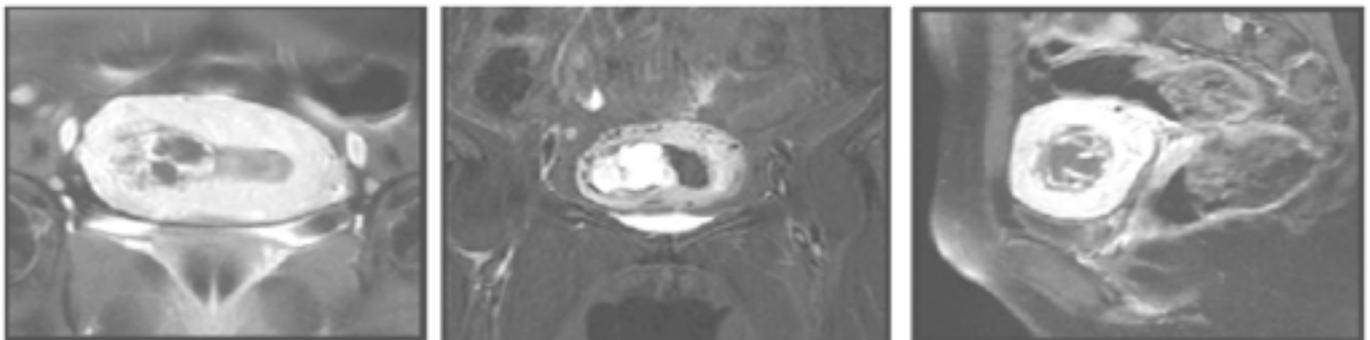
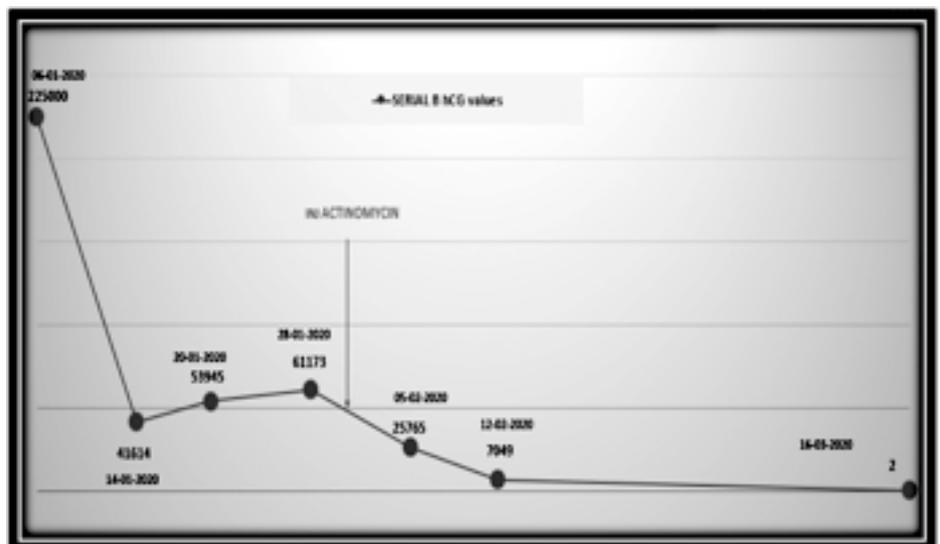


Fig. 4 - MRI PELVIS - PERSISTENT TROPHOBLASTIC DISEASE- INVASIVE MOLE (Heterogenous enhancing lesions invading myometrium near fundus of uterus with increased vascularity).

Fig. 5 - SERIAL B hCG VALUES TREND.



DISCUSSION

Gestational trophoblastic disease (GTD) is the term used to encompass a group of tumor typified by abnormal trophoblast proliferation. This disease is a benign disease with high potential to turn in malignant disease. These include the benign complete vesicular mole and partial vesicular mole and the malignant invasive mole. Invasive mole is deemed malignant due to its marked penetration into and destruction of the myometrium and its ability to metastasize. (4) Invasive mole follows approximately 10–15% of complete vesicular mole. (5,6)

The cure rate for women with a score d” 6 is almost 100%; the rate for women with a score e” 7 is 95%. (7) Approximately 8% of patients with complete moles will develop a malignant tumor after evacuation. (8) The Cancer Committee of the International Federation of Gynaecologists and Obstetricians (FIGO) has established the following guidelines for the diagnosis of post molar gestational trophoblastic neoplasia: four values or more of beta hCG plateaued over at least three weeks, an increase in beta hCG of 10% or greater for three or more values over at least 2 weeks, the histological diagnosis of choriocarcinoma, and persistence of beta HCG six months after molar evacuation. (9) By doing serial beta hCG levels, if levels show rising trend then one should suspect Gestational trophoblastic neoplasia. Elevated levels of beta hCG along with demonstration of vascular mass within myometrium without evidence of fetal material on USG is also strongly suggestive of Gestational trophoblastic neoplasia. (10) With methotrexate, complete remission is achieved in most non-metastatic and low risk cases. (11,12)

Even though this was low risk category type of tumor, due to rising trend of beta hCG decision of prompt management was done.

CONCLUSION –

Invasive moles usually respond well to single-agent chemotherapy such as Methotrexate. Even with the current widespread use of first trimester ultrasound, the dramatic presentation of complete mole is not very uncommon in the India. As GTN

is highly curable with effective chemotherapy, it is important to ensure careful follow up.

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Papillary carcinoma of thyroid in thyroglossal cyst

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ABSTRACT

Thyroglossal duct cyst (TGDC) is the most common congenital anomaly of the neck, and approximately 7% of all the adult population presents with thyroglossal duct cyst. Ectopic thyroid tissue is found in the thyroglossal duct cyst wall in up to 65% of cases. This thyroid tissue has the potential to develop some type of malignancy, with incidence of 1%, the most common of which is the papillary carcinoma of the thyroid. Thyroglossal duct cyst carcinoma is a rare finding that comes as a surprise to both the patient and the surgeon.

Key Words

Papillary carcinoma of thyroid, thyroglossal cyst

Case Description

Prior ethical consent was taken for the case. A 34-year-old man, who came with complaints of

midline neck swelling since childhood. He denied having previous neck irradiation. His family members were free from any type of malignancy.

Case discussion

Local examination of the neck revealed a firm, well-defined midline neck swelling measuring 3 x 4 cm, moves with protrusion of tongue. There was no cervical lymphadenopathy. Serum investigations that included full blood count, electrolytes and thyroid function tests were normal. Ultrasound of the neck revealed a cystic lesion with a solid component superior to the thyroglossal duct cyst. A CT scan of the neck was done showing a well-defined cystic lesion with enhancing solid components, lesion is superior to the thyroid gland, mildly enlarged lymph nodes are noted in Ia, bilateral Ib, II, III, IV, V regions. Thyroid scan showed normal morphology & trapping function of thyroid. No evidence of tracer uptake in clinically palpable nodule. The fine needle aspiration cytology (FNAC) of the midline neck swelling showed colloid cyst. A clinical

diagnosis of thyroglossal cyst with solid components within was set and the patient underwent Sistrunk operation.

At surgery, there was cystic lesion when it cut opened there was solid component inside the cyst. Single lymph node was excised for histopathological diagnosis. Sistrunk operation went uneventful.

Close follow up of the case was done. The histopathological examination of the thyroglossal cyst was obtained s/o thyroglossal cyst with deposits of well differentiated papillary carcinoma of thyroid with reactive lymph node. (Fig 1,2) PET scan was done s/o FDG avid bilateral cervical lymph nodes likely metastatic. Hence, a diagnosis of well differentiated papillary carcinoma of thyroid was made. Decision taken to post the patient for total thyroidectomy with bilateral cervical lymph node dissection with the opinion on an onco-surgeon.

The patient underwent total thyroidectomy with bilateral cervical lymph node dissection. The patient had an uneventful post-operative recovery. The histological report was similar to previous one well differentiated papillary carcinoma of thyroid.

Discussion

Thyroglossal duct cysts are the most commonly encountered congenital cervical anomalies. It accounts for 70% of all congenital neck masses. [1] During the fifth week of gestation, the thyroglossal duct lumen starts to obliterate, and the duct disappears by the eighth week of gestation. Rarely, the thyroglossal duct may persist in whole or in part. Thyroglossal duct cysts may occur anywhere along the migratory path of the thyroid, although 80% are found in juxtaposition to the

hyoid bone. The ectopic thyroid tissue in thyroglossal duct varied from 1.5% to 45% of cases [2]. Other frequent locations of thyroid ectopy are the tongue, larynx, trachea, esophagus, mediastinum, pericardium, diaphragm and neck branchial cyst [3]. Histologically, thyroglossal duct cysts are lined by pseudo-stratified ciliated columnar epithelium and squamous epithelium, with heterotopic thyroid tissue present in 20% of cases. The diagnosis usually is established by observing a 1- to 2-cm, smooth, well-defined midline neck mass that moves upward with protrusion of the tongue. Routine thyroid imaging is not necessary, although thyroid scintigraphy and ultrasound have been performed to document the presence of normal thyroid tissue in the neck. Clinically, most thyroglossal duct cysts are benign and present as slow-growing, asymptomatic neck masses [2, 4].

Treatment involves the "Sistrunk operation," which consists of en bloc cystectomy and excision of the central hyoid bone to minimize recurrence [5,6]. Approximately 1% of thyroglossal duct cysts are found to contain cancer, which is usually papillary (85%). The role of total thyroidectomy in this setting is debated, but is advised in patients with large tumors, particularly if there are additional thyroid nodules and evidence of cyst wall invasion or lymph node metastases. Squamous, Hürthle cell, and anaplastic cancers also have been reported but are rare. Medullary thyroid cancers (MTCs) are, however, not found in thyroglossal duct cysts.

Conclusion :- Normal thyroid gland with presence of carcinoma within a thyroglossal duct s/o papillary carcinoma arising in thyroglossal remnant rather than a metastasis from a primary carcinoma of thyroid.

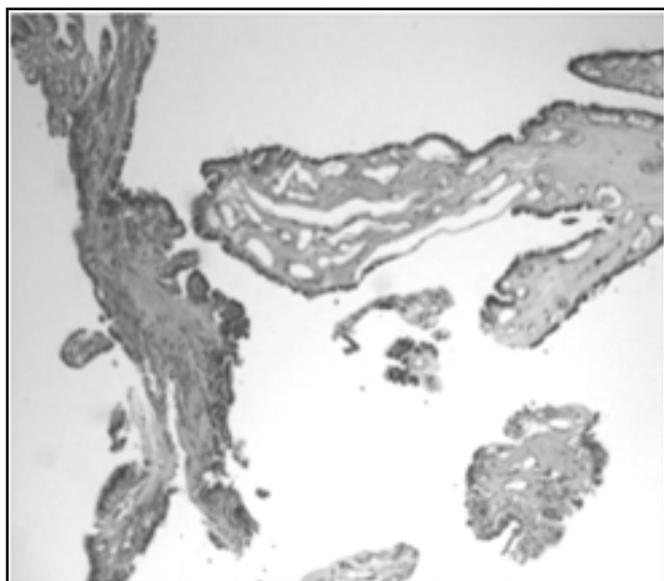


Figure : 1

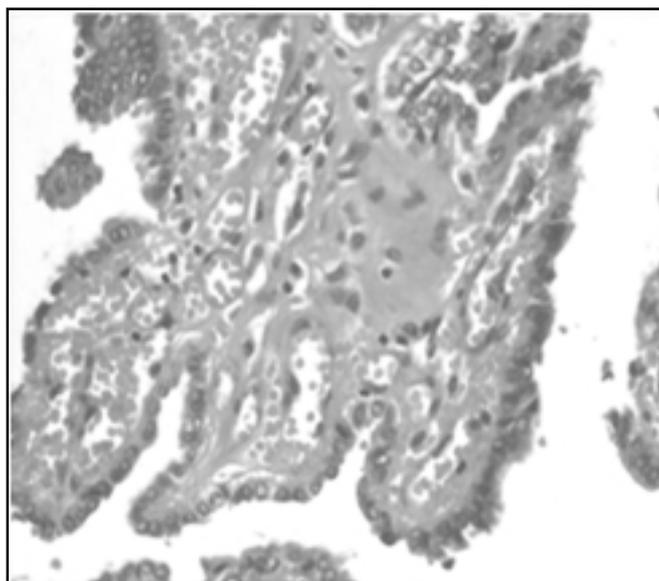


Figure : 2

Histopathological slides showing well-differentiated papillary carcinoma of the thyroid.

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Discoid Lupus Erythematosus With Systemic Manifestation

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Abstract

Lupus erythematosus (LE) is a chronic autoimmune disorder with multisystem involvement with varying spectrum of symptoms in between localized multiple dermatological manifestations cutaneous LE (CLE) on one end of the spectrum and severe systemic LE (SLE) on the other end. Etiology being multifactorial and polygenic. Discoid lupus erythematosus (DLE) is the most common form of chronic cutaneous lupus erythematosus DLE is a disfiguring, chronic skin disease, with a significant impact on the patient's everyday life. DLE patients display well-defined skin lesions, often in sun-exposed areas. The disease often has a chronic and relapsing course. It is important to confirm a CLE diagnosis histopathological examination by a biopsy and in that there are several differential diagnosis.(1) Classic DLE lesions begin as red-purple macules, papules or small plaques and rapidly develop a hyperkeratotic surface. Most patients with untreated classic DLE lesions suffer indolent progression to large areas of cutaneous dystrophy

and scarring alopecia that can be psychosocially devastating.(2)

Here in this case, presentation began with skin manifestation with progression towards systemic involvement patient was later labelled as Systemic Lupus Erythematosus with Discoid Lupus Erythematosus

CASE REPORT

36 year old female with congenital port wine stain on left half of face presented to Medicine OPD with chief complaints of Joint pain of bilateral Lower Limbs with Swelling And tenderness and intermittent fever since last 6 months associated with multiple skin lesions and facial oedema. Six months back patient developed fever intermittently and malaise associated with pruritus for which patient took symptomatic treatment. Later she noticed Rashes over both cheeks associated with oral ulcers inside mouth Figure 4. developed within 5-6 days causing decreased appetite due to burning sensations while eating. Rash started as flat mucosal lesion in mouth to raised red-purple

lesions approximately each measuring of pea sized lesions later forming fluid filled lesions which later ruptured with clear fluid over chest, back and below knee Figure 2. With this complains patient was taking regular treatment from dermatologist with on and off oral steroid, but was not relieved of her symptoms. Two months later patient developed an event of loss of appetite, sleep and irritability with increased suspiciousness for which she started taking psychiatric treatment later patient was on tab clonazepam 0.25 mg HS. Patient present to our medicine OPD with increased rash, facial oedema and bilateral lower limb swelling associated with joint pain and intermittent fever and multiple skin lesions all over body Figure 3. and patchy alopecia. Figure 2.



Figure 1 : Port Wine Stain over left half of face



Figure 2 : Alopecia

Past medical history revealed congenital haemangioma with port wine stain over left half of face Figure 1., history of blood transfusion during pregnancy, history of haemorrhoids without any comorbidity of diabetes mellitus, hypertension, thyroid disorder, tuberculosis

Personal history suggestive of decreased sleep due to lower limb pain, decreased appetite.

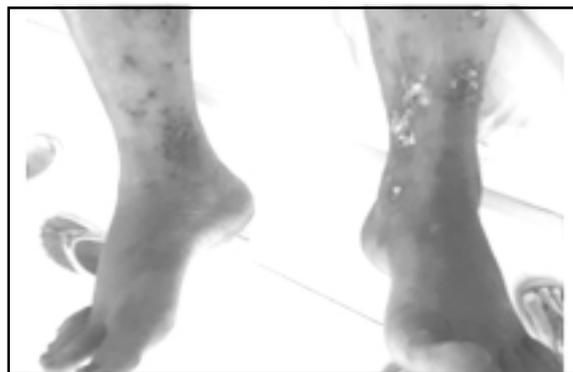


Figure 3 : Well defined ulcerative lesions over legs



Figure 4 : Facial oedema with oral ulcerative lesions

On examination patient is fairly nourished, afebrile with bilateral pedal oedema below the level of ankle and left facial oedema.

Head and neck examination, revealed discrete erosive lesions over the cheek, nose and scalp, measuring approximately 0.5×1 cm in diameter.

Scalp lesions causing scarring alopecia should be noted which illustrates erythematous, disc-like, scaly plaques showing signs of healing accompanied by scarring and hypopigmentation. Posterior Neck reveals scarring with erythema and hyperpigmentation Neck Lymph nodes are not palpable.

Intraoral examination revealed small multiple white lesions which are non painful along mucosa and hard palate

Examination of the trunk revealed multiple, well-defined, roughly round erosive lesions measuring approximately 1 × 2 cm in dimension. Below Knee patient had bilateral approximately round well defined ulcerative lesions largest one measuring 2x3 cm

Based on history and clinical examination a provisional diagnosis of DLE with systemic manifestation was made. Differential diagnosis of SLE and Vasculitis was considered.

Investigations

Complete Blood Count suggestive of Bicytopenia with Haemoglobin 12.2 gram%, with Total leukocytic count 2090 cells/mm³ and platelet count reduced to 60000 cells/mm³. ANA (Anti Nuclear Antibody) Positive , Electrocardiogram suggestive of long Qtc with Left axis Deviation with Left Bundle Branch Block(LBBB), Urine Protein=+1 trace, no urinary red cells, 24 hour urine protein 1734mg / day, Spot Urine Protein >155 mg/L, creatinine 15.58, protein / creatinine 0.99 suggestive of low grade proteinuria, Serum AST 292U/L, Serum ALP 140 U/L , Serum Albumin 3.0 mg/dl, blood culture and urine culture had insignificant growth , RA factor Negative, HbA1c 5.7

Histopathological Examination :

The biopsy shows extremely atrophic epidermis with lamellated hyperkeratosis. Papillary

dermis shows sclerosis with melanin incontinence. Focal vacuolar dermatitis with colloid bodies is seen. Dermo-epidermal junction shows smudging with pyknotic neutrophils. Basement membrane is thickened and prominent Figure 5. There is also thickening of collagen bundles seen in upper two-third of reticular dermis. Follicular infundibulum is dilated and plugged with parakeratotic stratum corneum. There is mild perifollicular infiltrate of lymphocytes seen which is suggestive of Sclerotic and atrophic variant of DLE

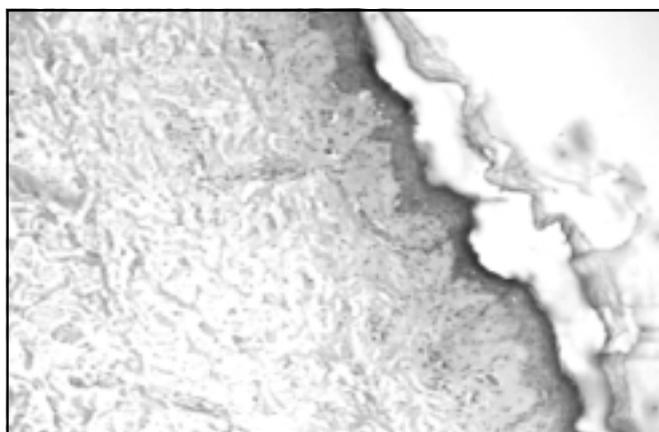


Figure 5 : Atrophic epidermis with lamellated hyperkeratosis with thickened basement membrane

On the basis of clinical findings , laboratory and histopathological examination. Patient was diagnosed as Discoid Lupus Erythematosus with Systemic Lupus Erythematosus and patient was mainly started on injectable steroid with injectable methylprednisolone 1 gm intravenous once a day for initial 3 days as a 'pulse therapy' later shifted to oral steroid with oral azathioprine 100mg once a day and was given multivitamins , antibiotics , mupirocin ointment, sunscreen lotion , intralesional steroid therapy with injection triamcinolone etc. With this therapy lesions started improving with scab formation in multiple lesions. Figure 7. Figure 8. & oedema over face significantly reduced Figure 6.



Figure 6.

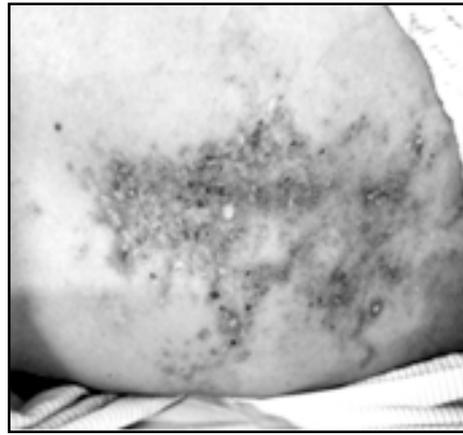


Figure 7.



Figure 8.

Figure 6. Figure 7. Figure 8. Images suggestive of improvement of lesions after pulse steroid therapy with injection methylprednisolone 1gm intravenous once a day for three days. In figure 6 is after pulse therapy reduced facial swelling, lesions in figure 7, 8 show scab formation with improvement in ulcerative lesions.

DISCUSSION

DLE is a skin disorder with minimal systemic involvement. DLE begins as erythematous, oedematous, scaling papules that spread centrifugally and coalesce into plaques, the size may vary from a few millimetres to a few centimetres. Scales produce a carpet-tack appearance after lifting and reveals dilated pilosebaceous orifices occupied by horny plugs. The healing of a lesion begins in the centre which produces atrophy and scarring, telangiectasia and pigmentary changes. Scarring alopecia is a significant finding(3).

Mucosal involvement is seen in about 24% of the DLE patients. Lesions appearing as chronic plaques or lichen planus-like oral lesions, ulcerations, cheilitis and plaque-like palatal lesions are seen.

The pathophysiology of DLE is poorly understood. It has been suggested that a heat shock protein is induced in the keratinocyte following ultraviolet (UV) light exposure or stress, and this protein may act as a target for gamma (delta) T-cell-mediated epidermal cell cytotoxicity.(3)

Patients may manifest any symptom of SLE.

Therefore, the history should include an assessment for symptoms of pleuritis, pericarditis, neurologic involvement and renal involvement. It may present with constitutional symptoms such as fever, malaise, multiple joint pain, myalgia, myopathy etc to systemic manifestation of various systems in which cardiopulmonary involvement with pleuritis, pericarditis, myocarditis, endocarditis, pleural effusion etc. Neuropsychological manifestation like headaches, personality changes, seizures, cranial and peripheral neuropathies, cerebellar dysfunction etc. Renal manifestations include glomerulonephritis, proteinuria, haematuria, urinary casts, hypertension etc. Haematological manifestations like anaemia, leukocytopenia, thrombocytopenia, lymphopenia, lymphadenopathy, vasculitis etc. Gastrointestinal manifestations like impaired bowel motility, bleeding or perforation, pancreatitis etc are seen(4)

The treatment of DLE includes avoiding exacerbating factors and suppression of lesions. Those who are sensitive to sunlight should apply UVA/UVB-15 protective sunscreen daily and cover the body parts while being outdoors.

Topical steroid and/or Intralesional cortisone injections is the first-line treatment for localized cutaneous and mucosal lesions. Systemic corticosteroids, calcineurin inhibitors, pimecrolimus cream or tacrolimus ointment, aminoquinoline antimalarials, dapsone or imiquimod 5% may also be used along with topical antifungal therapy. Topical hydroquinone is used for the treatment of hyperpigmented scars. More recently, biological therapies with agents like etanercept and tumour necrosis factor have demonstrated an overall decline in the disease activity. Efalizumab, a monoclonal antibody and a T-cell modulator has also shown a good response in patients with DLE.

Patient should follow-up every 6 months as DLE is pre-cancerous condition, for the early detection of SLE and to minimize scarring.

In patients of SLE with mild features of fever, arthralgia, myalgia can be managed with NSAIDs. Hydroxychloroquine (HCQ) can be added if required as skin lesions and arthritis also responds to HCQ. In patient with severe life-threatening symptoms systemic steroid should be used. Acutely ill and patient with Lupus Nephritis Pulses of Methylprednisolone (1gm/day) should be given for 3 days.

CONCLUSION

SLE may begin with skin manifestation of discoid lupus erythematosus with progression to systemic involvement patient in the course of disease. Here we have case who presented with skin manifestation of DLE and upon further investigation found to be have systemic manifestation of SLE.

RECENT CLINICAL TRIALS

New disease-modifying conventional and biologic agents used alone, in combination or sequentially, have improved rates of achieving treatment goals, including limiting of glucocorticoid use. More specifically, studies

have shown that MMF or enteric-coated mycophenolate sodium is effective like azathioprine in patients with general lupus or Lupus Nephritis. Calcineurin inhibitors added to standard-of-care induction therapy for Lupus Nephritis (so called 'multitarget' therapy) may increase complete renal remission rates and maintain remission. The first regimen tested included tacrolimus in combination with Mycophenolate mofetil and glucocorticoids, as both induction and maintenance therapy (5). Rituximab is anti CD20 monoclonal antibody tried in patients of SLE. Belimumab, a monoclonal human antibody that inactivates B lymphocyte stimulator can also be used for treatment of patients with active disease, who are refractory to standard treatment. (6)

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Case Discussion of rare vulval neurofibroma

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Abstract :

Neurofibroma is benign tumour that rarely affects the vulva. Here we discuss case of 45 year old, post-menopausal, known case of NF1 since birth, with vulval mass since 10 years which increased rapidly in 3-4 months. Patient was operated and post operatively she was stable. Histopathological examination reported neurofibroma of the vulva.

Introduction :

In last few decades number of vulvar lesions are increased. Patients came with complaints of itching, burning, or swelling. Although benign vulvar masses are an uncommon condition of the lower genital tract, it is important to consider these tumors in the differential diagnosis of vulvar complaints. These disorders include vulvar atrophy, benign tumors, hamartomas, and cysts, infections disorders, and nonneoplastic epithelial disorders.(1) Neurofibroma is benign tumour that rarely affects the vulva. Vulval neurofibroma makes

upto 5% of all benign vulvar lesions.(2) Neurofibromatosis encompasses two clinically and genetically separate conditions, with an autosomal dominant pattern of inheritance.(3) The more common neurofibromatosis type 1 (NF1) is caused by mutations in the NF1 gene on chromosomes 17, half of which are new mutations. NF1 is characterized by neurofibromas (benign peripheral nerve sheath tumors) and skin involvement, and may affect numerous systems.(3) Here we discuss the case of vulval neurofibroma operated in our tertiary care Centre.

Case Details :

45 years old, Para 2, Living 2, tubectomised, post-menopausal since 15 years, came with complaints of vulval swelling since 10 years which was rapidly increasing in size since 3 -4 months. Patient was known case of neurofibroma since birth.

No history of vaginal discharge, burning micturition, pain at perineal area, any itching or discharge from swelling, abdominal pain, bladder

or bowel complaints.

Patient was married since 30 years, with 1 male and 1 female child, both home deliveries. Tubal ligation done 20 years back.

Patient had history of sebaceous cyst excision over scalp 15 years back.

Patient gave no other significant medical history. On examination, she was vitally stable. Neurofibroma masses were present on whole body. Systemic examination was within normal limit. On Per Speculum examination, cervix and vagina was healthy. Per Vaginal examination findings shows atrophic and anteverted uterus, bilateral fornices were free and non-tender.

On Local examination, Right side labial swelling approximately 15×5 cm, Soft cystic consistency, covered with normal skin was seen. No redness, raised local temperature, signs of

inflammation or ulcer seen. (Figure 1)

All lab investigations were within normal limit. 2D echo was normal, Abdominal and pelvic sonography was also normal.

High resolution sonography of the perineal region was done, which suggestive of large semisolid lesion, well defined and just beneath the skin with areas of minimal liquefaction.

Vulval mass excision was done under spinal anaesthesia. And mass was sent to histopathology. (Figure 2)

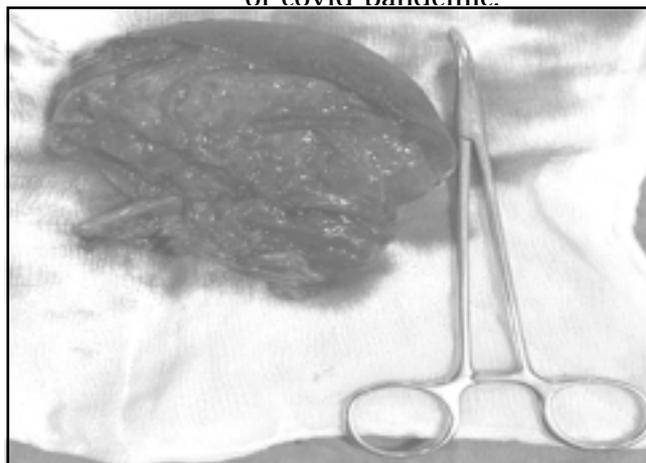
Histopathology report was suggestive of Neurofibroma. (Figure 4)

Post operatively antibiotic was given and patient recovered in 3 days and discharged.

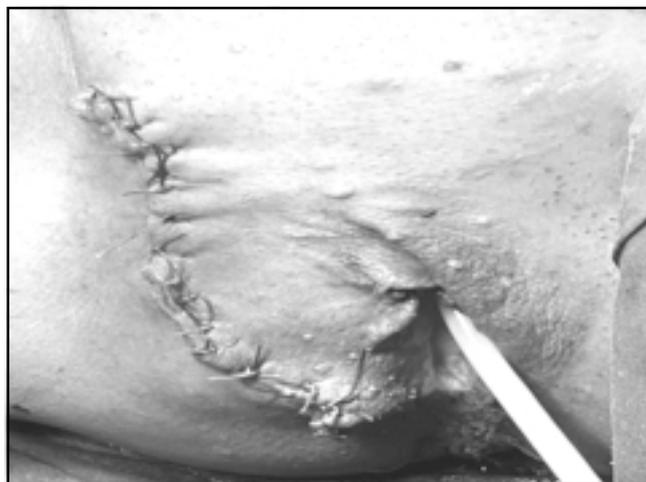
Regular follow up for 6 month show no complaints at surgical site and no recurrence of lesion at labia. We lost further follow up because of covid pandemic.



**Figure 1 :
Vulval Neurofibroma**



**Figure 2 :
Cut Section
of Vulval
mass**



**Figure 3 :
Post-
operative
perineal
area**

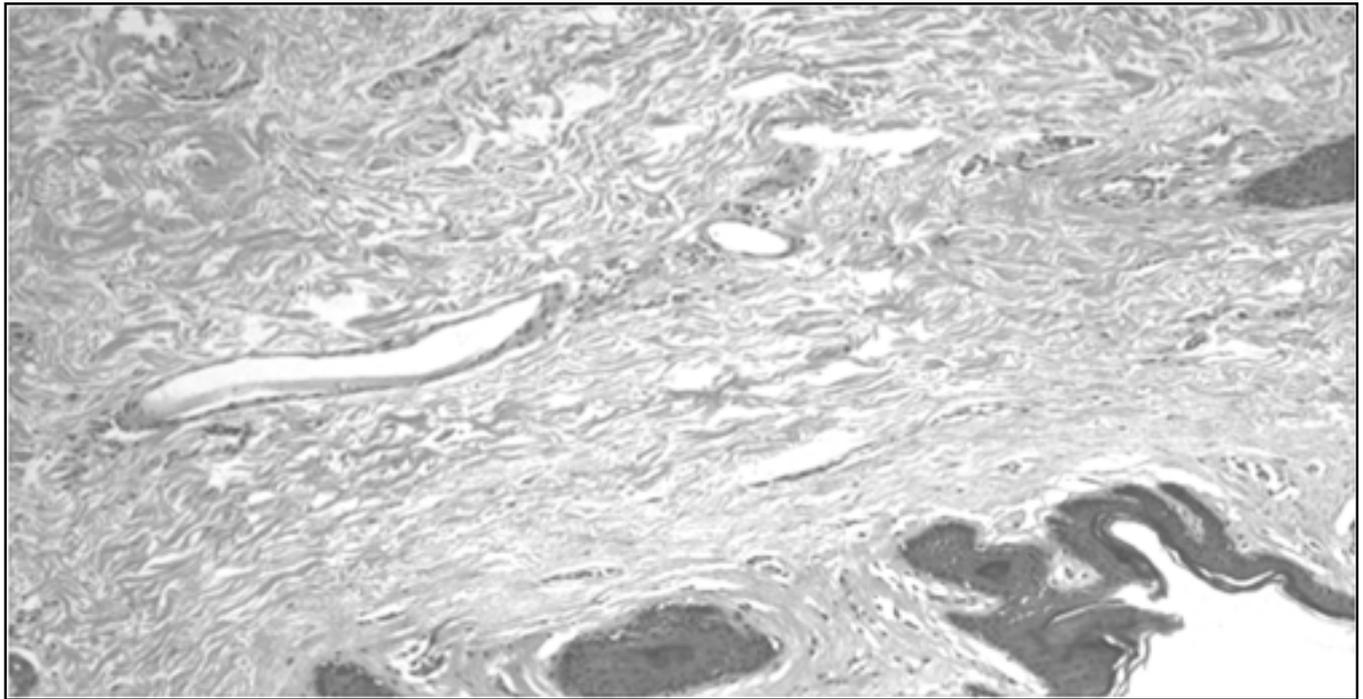


Figure 4: Histopathology Slide

Histopath report – Vulvar mass showing hypocellular proliferation of bland spindle cells with interspersed “Shredded carrot collagen”.

Discussion:

Neurofibromatosis (NF) is one of the more common types of neurocutaneous syndromes that are well known because of its clinical features. Its hallmark sign is the neurofibroma, which is a tumor of nerve connective tissue. There are two types of neurofibromatosis that are clinically and genetically distinct. The first type is NF-1, also called von Recklinghausen’s NF, which is the more common of the two, and its clinical features include café-au-lait spots and neurofibromas. The second type, NF-2, is much rarer, and its clinical feature is bilateral vestibular schwannomas (or acoustic neuromas), with café-au-lait spots and skin neurofibromas being less common (4). Neurofibromatosis was recognized as a disease for well over a hundred years. In 1882, Friedrich von Recklinghausen published his famous monograph

describing this entity, and this disease became known as von Recklinghausen disease, which is NF-1. Other people have also recognized this disease as early as the eighteenth century, such as Tilesius and Akenside. In 1981, Dr. Vincent Riccardi recognized NF-2 as a clinically distinct entity from NF-1 (5). Neurofibromas are benign Schwann cell tumors arising from fibrous tissue surrounding peripheral nerve sheaths, and are a cardinal feature of neurofibromatosis. They are composed of Schwann cells, fibroblasts, perineural cells, and mast cells, and can affect any organ in the body. There are four different types of neurofibromas: focal or diffuse cutaneous neurofibromas, subcutaneous neurofibromas, deep nodular or diffuse plexiform neurofibromas, and spinal neurofibromas (6) The cutaneous neurofibromas are sessile or pedunculated masses on the skin, which are fleshy and resemble skin tags, and

can vary in size. Although non-tender, they can be pruritic and sometimes number in the hundreds. The subcutaneous neurofibromas lie deeper and look like bumps on the skin, which can sometimes be tender. The deep nodular neurofibromas occur along proximal nerve roots and major nerves, and resemble cutaneous and subcutaneous neurofibromas, although they are not palpable.

Neurofibroma is benign tumour that rarely affects the vulva. Vulval neurofibroma makes upto 5% of all benign vulvar lesions. (2) Vulval involvement is found in about 18% of women with NF1 while approximately half of all vulval neurofibromas are found in women with NF1. (7) Neurofibromas involving the female genital tract commonly involve the clitoris and the labia but may also affect the vagina, cervix, endometrium, myometrium and ovary and may be affected and may be associated with urinary tract NF. (8) vulval neurofibroma have been associated with trauma such as episiotomies or other vulval injuries. (9) The association with vulval trauma and urinary tract neurofibromatosis should be borne in mind when managing patients with such condition and history of trauma and urinary symptoms should be sought. (10)

In this there was no suggestion of urinary tract involvement from history and Ultrasonography hence cystoscopy was not done. In this case there was no malignant changes and surgical excision was therapeutic treatment. Histopathological examination reported neurofibroma of the vulva. Such cases should follow up closely for possibility of recurrence, unfortunately because of

covid pandemic we lost follow up of this patient.

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Leadership roles in inventing strategies to thwart the challenges of the pandemic. A Leader Is a dealer in hope : Napoleon

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February 26, 2019, India woke up to the buzz of Indian air Force carrying out surgical strikes on the terrorist camps to avenge the Pulwama CRPF attack. And How was the Josh? It was indeed High! Now is the need to mount another surgical strike but this time against the terrorizing Corona virus which has become of unprecedented global concern. The disease caused by SARS- COV2 has affected around 116 million people globally with mortality of 2.5 million till date.

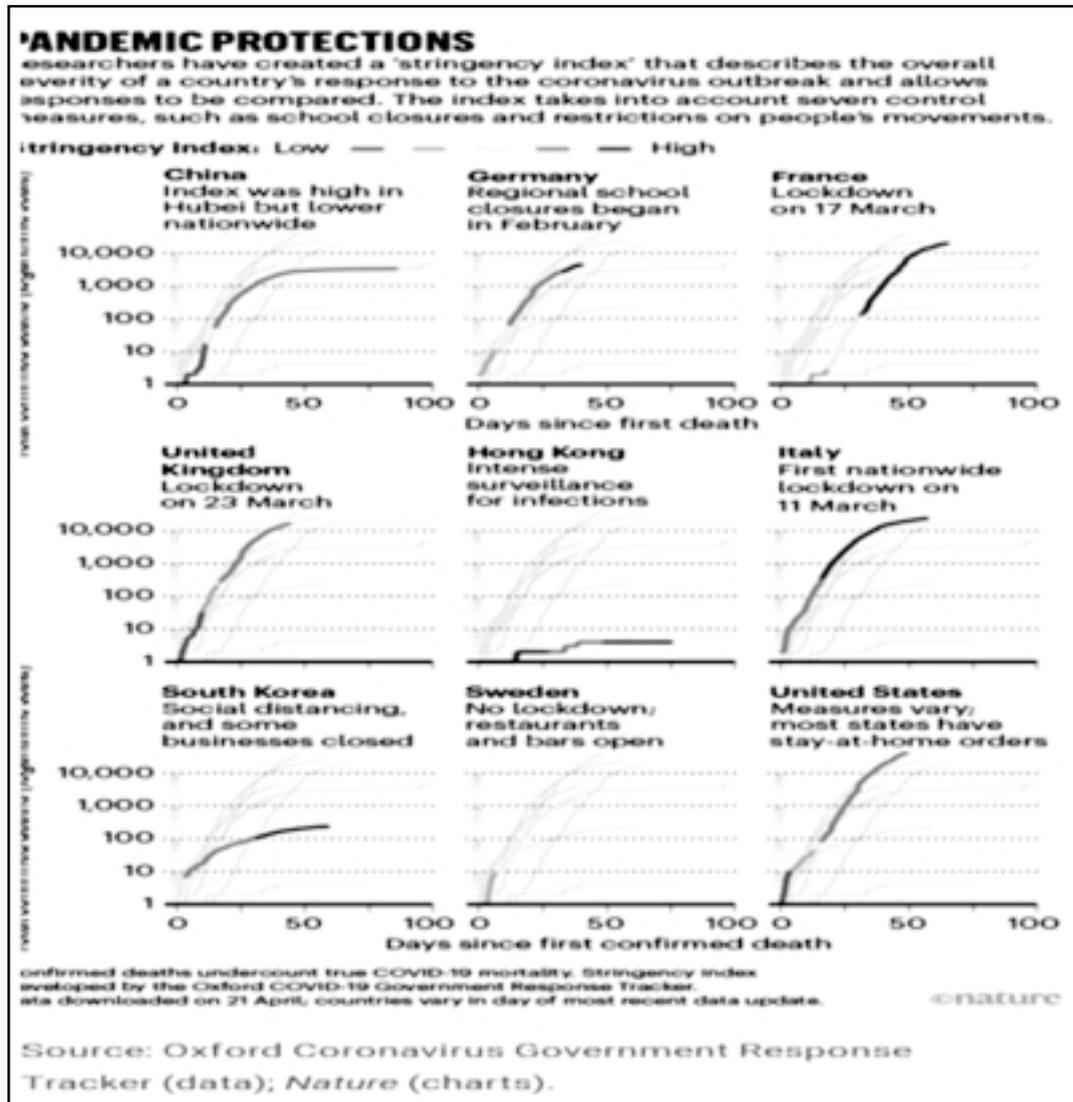
Surgical strike is a military operation which is intended to damage legitimate target with minimum collateral damage with the aim to neutralize targets to prevent escalation to a full-blown war. It requires high level of precision, extensive planning, preparation, time management, surveillance and coordination. Now that the first wave of the pandemic over and the world on the verge of second surge, we should make a preemptive surgical strike on Covid-19 . What we need now is an effective leadership which can guide us through this uncertain time. The challenges we faced for the first wave were different. We were not sure how to deal, with what

to deal and how dreadful was the enemy. To combat the first wave, WHO had come up with the global strategic objectives on 14 April 2020

- Mobilization- prevention with hand hygiene, respiratory etiquettes, physical distancing.
- Controlling- finding cases, tracing contacts, providing care.
- Suppressing - travel restrictions.
- Reducing burden - provision of critical care, protection of front liners.
- Developing vaccine and therapeutics.

Impact of the first wave caused several social, economic repercussions. There was increased morbidity and mortality attributable to presence of co-morbidities like diabetes, hypertension, ischemic heart disease, increased load on healthcare system with attention to incentive care, COVID-19 positive and post COVID-19 patients with complications coming for surgery and anesthesia , long COVID-19 syndrome, prolonged requirement of oxygen therapy, thromboembolic complications and the list is endless. (Fig 1 Showing the Stringency Index of different countries)

Figure 1



Lockdown has led to other problems such as weight gain, delayed management of various non-communicable diseases including cancer, interruption of various national health care programs. Mental health challenges include but are not limited to chronic stress, anxiety, depression, alcohol dependence, self-harm and domestic violence. Amongst the economic challenges faced as a collateral damage, India saw its largest GDP contraction ever in quarter one of 2020-2021 signaling a deep recession with sharp rise of unemployment, uncertainty amongst farmers, collapse of tourism industry, decreased government

income. The socio-cultural infrastructure of Indian families has come under threat due to social distancing which has become a necessity.

The second wave has posed different challenges and require a different leading approach. The challenges now we face are to suppress the second wave, to modify the treatment policy if required, to be able to segregate the cases which require home quarantine or hospital facility, to follow and care the post COVID-19 patients in rehabilitation OPDs, effective distribution of vaccine to 130 million people of India. And above all, to keep the economy going and to compensate

for the economic damage without posing a risk to the health of mankind! In short it requires a well-planned surgical strike!

A Pew research Centre survey of more than 14000 adults across 14 advanced economies in Europe, Asia North America and Australia found 73% thought their country did a good job of tackling the coronavirus outbreak. And it was related to feelings of trust in the government, authorities and the leaders to face the different challenges of the pandemic. Communication is the key. A country's wherewithal when it comes to testing is a key measure of its ability to deal with the impact of Covid-19. India has responded to the pandemic with system development, capacity building, upgrading the infrastructure with political

support and implementation of testing as per ICMR guidelines. On September 2020, ICMR Director General has advocated 5-T strategize. Test, Track, trace, Treat, Technology. For each step we need to have clear vision for leading the world which is trapped in the embrace of Corona at the dawn of the 3rd decade of the new millennium.

We must maintain the precision without losing the momentum of our attack Let's think how? Start with a realistic goal : To bring mortality of COVID-19 pandemic in India to 0%. Mortality in India has been 3-4% which is estimated to be 1.37 lakh deaths. It is said that 70% herd immunity would prevent further transmission. But it is difficult to measure. So, vaccination is the only solution.

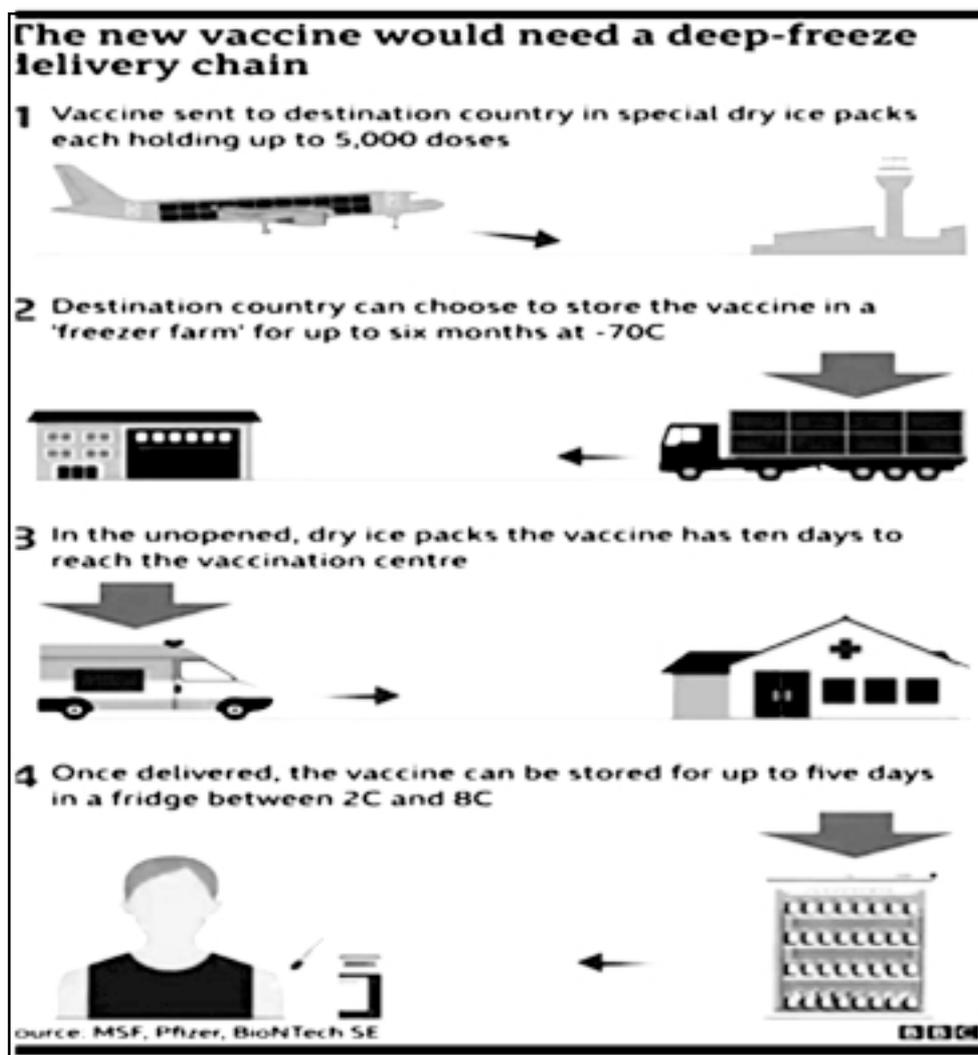


Figure 2 Vaccine delivery

(Fig3) Chain of COVID-19 status Showing the basic design of the app which can show the status or track the same.

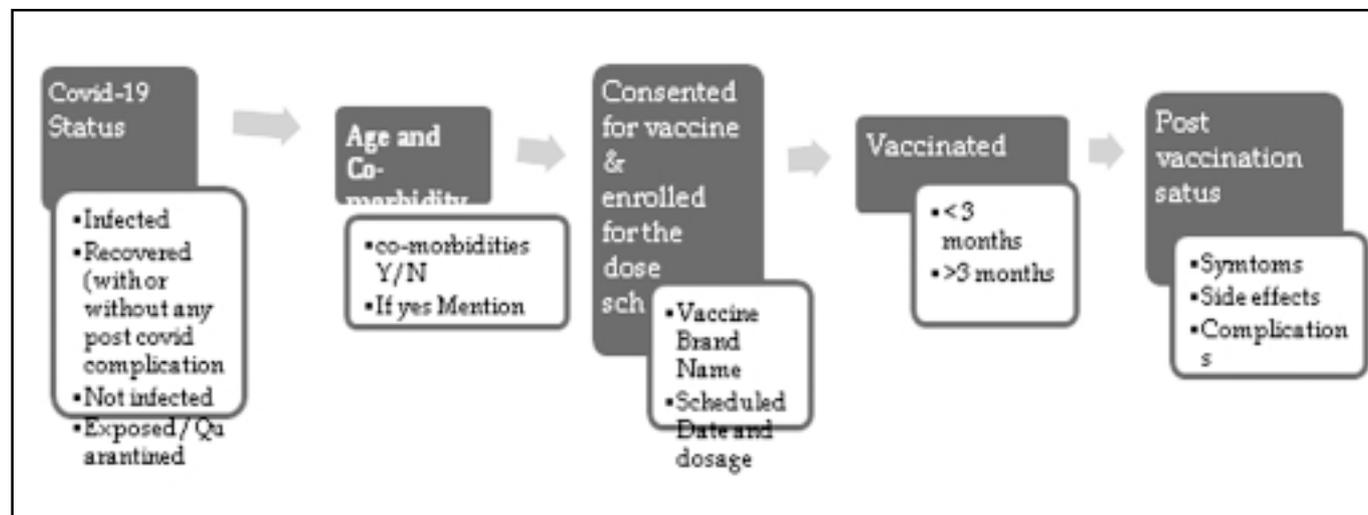


Figure 2 Fig 3 Chain of COVID-19 Status

The difference between the earlier pandemics and COVID-19 is that we have advanced technology to our side which wasn't there earlier. We should take this to our advantage and utilize technology to our best!

It is reported that worldwide around 249 million doses of vaccine have been administered which is the biggest achievement. A few suggestions for vaccination programme in India could be:

- National COVID-19 vaccination program can be carried out with such leadership qualities using technology as a disruptive innovation strategy, similar to 'Arogya Setu' app was for testing and tracking cases.
- Government can tie up with different medical bodies such as Indian Medical Association or Indian Society of Anesthesiologists to distribute the doses systematically.
- To reach the rural population, this can be combined with other National vaccination drives such as polio or BCG.

- Government can combine two programs together like Reproductive and child health program (RCH) can give polio vaccine to child and COVID-19 vaccine to mother and other family members.
- NGOs can help.
- Government can give an identity number to each citizen of India which can be linked to his or her Aadhar card.
- For those who don't have one, local organizations and leaders will be a key factor. Even primary health care centers will have a key role.

It's the need of the hour to lead with an attitude which can create trust amongst people. 'Adversity brings in opportunity'. We must take this time in our stride to create and encourage research and innovations. As they say 'What doesn't kill you makes you stronger! We should always keep on walking ahead. We must take responsibility irrespective of one's designation. A true leader doesn't need a title!

India should lead and show the world how to curb the virus spread by vaccine program by her

own example. Management is doing the things right but leadership is doing the right things! True leadership should strive for authenticity over perfection.

Before 2020, 'Corona' was the word used for crown and 'mask' was the accessory used in hospitals and operating rooms. No one had thought about virus with a crown or mask as routine part of dressing.

The question still remains what's next? Is the challenge of COVID-19 is over? Are there further expectations of future from us? Life has become like a sci-fi movie. Some alien attacking from a distant planet or this virus taking over the world.

It is quiet relatable isn't it? So do we need to be like a superhero? I doubt that is possible.

All we need to possess are qualities of Care, Courtesy and Consideration. And last but not the least the most important leadership quality one must possess is that of empathy and compassion.

There is an African concept of humanity called "UBUNTU" which means 'I Am' because 'We Are'! It transudes the concept of togetherness unanimously which the world needs now.

{ This essay is an offering to those 515 doctors who died saving other people of society}

Challenges of Lockdown and Post lockdown Vigilance : Through the eyes of a medical student

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Abstract

Background: The metamorphic effects of the COVID-19 pandemic and the pivotal need of lockdown has restricted every medical student in India to the few available medical subject learning experiences & practical skills. This was an unanticipated change for medical students in India who faced a hard time dealing with this changed perception of 'normal'

Aim and Objective: This perspective is put forth to portray the chaotic mind and disturbed education system of every medical student which should make educators, politicians, health care system regulators and policy makers introspect on their strategies in regard to the changes and challenges faced by these students.

Conclusion: It explains how these students should play the role of 'The Vigilante' in society in future, considering that COVID-19 is here to stay and through their vigilance prove to be role models for generations to come.

Keywords

Covid pandemic, Vigilante.

Background

Since the past few months, news and media outlets are flooded with pictures, interviews and endless information about the novel Corona virus, and how it has sabotaged different parts of the world within no time. The COVID-19 pandemic is a situation which has caught everyone unaware and has caused numerous health and economic issues. The impact of this pandemic has translated into revolutionary changes in public health care systems around the world. It was declared as a public health emergency of international concern by the World Health Organisation (WHO) on January 30th 2020¹. This was the same day when the deadly COVID-19 made its way to India, first in the state of Kerala² and since then it has shaken the foundation of healthcare systems in India. In an attempt to prevent transmission of this disease, a national lockdown was declared on 25nd March, the duration of which varied in different states depending upon the number and severity of cases^{3,4}. Both the pandemic and the lockdown caused a drastic change in the, personal and professional life of each and every individual and

medical students were no exception. Like all others, medical students had a lot to lose. Many sudden and unexpected changes left medical students adjusting to the 'new normal'. The state of affairs after activities resume, however, still remains a cloud of doubt.

Changes and challenges

The effects of the pandemic were as new and unknown as the disease. Among the several challenges faced by the medical students, academic difficulties being the major one. Shift of educational modalities from classroom to online platforms caused discomfort among many students due to unavailability of resources, which facilitate online education such as laptops, computers or tablets. More so, many students in India hail from remote villages where internet connectivity and power supply are poor and irregular, causing them to lose out on learning, as compared to their counterparts living in cities. More over the knowledge of use of these online modalities is poor considering the fact that online education was never a customary practice in India prior to the pandemic. Also, inability to contemplate the academic material taught on an online forum is a genuine difficulty faced by many students⁵. Adding to the problem was that professors and teaching faculty were occupied with providing 'COVID-19 services' to patients due to overwhelming of healthcare facilities, which led to restricted time of quality teaching.

It is a well-known fact that medical education is based on understanding of the intricacies of the human body and practical application of this education which is obtained by interaction with teachers, professionals of this field and patients. Both the pandemic and lockdown imposed a restriction to movements of the students to the hospitals, compromising on their practical experience as well. Attending virtual dissection sessions was not well understood by many of the

students for the 'fabric of the human body' cannot be appreciated with a virtual atlas or with such online modalities.⁶ To add to misery of medical students, cancellation of semester examinations, prolongation of academic curricular years, temporary suspension of clerkship and internship,⁷ postponing of postgraduate examinations like National Entrance Examination Test for Postgraduate students and Step examinations along with several other examinations for Indian Medical Graduates caused them to lose out on their professional years, further worsening their insecurity.

Due to shortage of medical personnel, final year medical students were also roped in to join the battle against COVID-19.⁸ These students were expected to attend to COVID-19 infected patients. It was assumed that this move caused stress and fear of contracting the disease not only in the minds of students but also their guardians. Lack of available cure or vaccination added fuel to the fire.

A knowledge gap between fact and perception about the disease and its preventive measures was also observed among medical students.⁹ Lack of knowledge about use of masks, social distancing and personal hygiene practices will not only affect the students' health, but also the patients whom they will be treating.

In India, although doctors are considered second to God, it is ironic that this pandemic has brought out the unseen factor of discrimination against and inappropriate behavior towards doctors (residents and interns as well) and their families due to the people's perception of them being potential carriers of this disease which adds a social burden to the pre-existing stressful condition of these students.

Post lockdown vigilance:

Why is it necessary?

The word 'vigilance' in the dictionary means "action or state of keeping careful watch for

possible danger or difficulties".¹⁰ Students must understand and acknowledge that although the restrictions of the lockdown are released, the peril of COVID-19 still persists and carelessness on their part can not only affect them but also the ones in their vicinity. Medical students form an integral part of the healthcare system and hence vigilance is required at both personal and professional levels.

Vigilance at personal level :

Medical students should equip themselves with the available knowledge about the disease through documented data, precautionary guidelines and treatment protocols from authentic sources. The students must also take responsibility to educate members of society, families, fellow students and patients about the disease, so as to ignite the flame of awareness among the general public which may go a long way to curb the disease.

In these trying times, students must also practice what they preach. They must be the change they wish to see. Students must wear a mask each time they step out of their house or university hospital so that they do not spread the infection in case they are asymptomatic carriers of the disease. Practices such as social distancing must be strictly followed by these students in classrooms, laboratories, patient rooms and with friends or colleagues. Hand and personal hygiene must be ensured at home and outside. A thorough cleansing of their body upon returning home is also recommended.

In addition, students should focus on positive psychologic, nutritional and physical health and avoid undue stress and take plenty of rest. Students need to ensure intake of a balanced diet, exercise at home and practice mental health activities like meditation and relaxation exercises or try pursuing a hobby.

Vigilance at professional or academic level

The COVID-19 pandemic must not act as an obstacle in the path of learning. Students must gain additional knowledge about the use of internet for academic purposes. However, they should be cautious while using online education tools, for the internet is like a deceptive sea, it may look shallow and calm from a distance but in reality, it can pull one into a violent whirlpool in the depths of improper and unethical practices, difficult to get out of. Students must refrain from such practices for temporary gains and focus on long-term benefits of understanding the subject instead.

Students must educate their patients about the causes, effects, symptoms and preventive measures of the disease so as to diagnose and get treated at early stages. Students need to treat COVID 19 patients with compassion and care, not to mention raising their voice against discrimination towards such patients and other frontline workers assisting with their treatment.

Conclusion

Medical students are considered to be the torch bearers of any healthcare system. They have faced the pandemic and lockdown with a brave heart and must continue to be vigilant despite the challenges. They now need to take it in their stride and work not to fight but to embrace the 'new normal', for a change no matter how sudden or shocking it may seem, always brings a new opportunity for the betterment of society.

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