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Editorial

Learning by doing: Use of simulation in learning medicine.

The Editorial Team, Dhulikhel Medical Update.

In the dynamic landscape of medical education, the integration of simulation-based learning has emerged as a transformative force, reshaping the way future healthcare professionals acquire essential skills. Dhulikhel Hospital has been at the forefront of providing skill-based education for a considerable period. The hospital boasts a dedicated clinical skills lab equipped with state-of-the-art facilities, including laparoscopy simulation models, suture pads, surgical instruments, manikins, and anatomical models.

Dhulikhel Hospital's commitment to advancing medical education is evident through its regular organization of training programs such as the Basic Surgical Skills workshop, Basic Life Support workshop, and specialized sessions on laparoscopic and endoscopic techniques, among others. These initiatives not only augment theoretical knowledge but also provide healthcare professionals with hands-on experience in a controlled environment.

The simulated scenarios offered at Dhulikhel Hospital's clinical skills lab create a bridge between theory and practice, allowing students to refine their clinical skills. The presence of laparoscopy simulation models and other advanced equipment ensures that medical students and resident doctors are well-prepared to handle the complexities of modern medical procedures.¹

Furthermore, these initiatives foster a culture of continuous learning, where healthcare professionals can stay abreast of the latest advancements in their respective fields. The hospital's emphasis on collaboration and interdisciplinary training during simulations enhances communication and teamwork, essential components for providing comprehensive and patient-centered care.²

Dhulikhel Hospital's unwavering dedication to simulation-based learning stands as a testament to its commitment to producing proficient, compassionate, and well-rounded healthcare professionals. As the medical landscape evolves, institutions like Dhulikhel Hospital serve as beacons of innovation, ensuring that the next generation of healthcare providers is equipped with the skills and knowledge necessary to navigate the challenges of modern medicine.

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Haemangioma of Soft Palate: A Case Report

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Abstract

Background

Haemangioma are the benign tumors of blood vessels, which are mostly present in childhood. We classify them as capillary, cavernous, and sclerosing types. These vascular tumors can affect the head and neck region and can also appear in different parts of the oral cavity and oropharynx.

Case Presentation

We report a rare case of soft palate haemangioma growing towards the oropharynx removed successfully with electrocautery.

Conclusions

Hemangiomas within the oral cavity necessitate meticulous medical and surgical management, irrespective of their benign origin and behavior.

Keywords: *Capillary Hemangioma, Case report, Electrocautery, Oral Cavity.*

Introduction

Hemangiomas are benign tumors of blood vessel origin and are classified as capillary, cavernous, or central.¹ These are relatively common benign proliferations of vascular channels that may be present at birth or arise during early childhood.² The majority of haemangioma involve the head and neck. However, involvement of oral cavity oral cavity is a rare entity.³⁻⁶ In general, haemangiomas are developmental and are often recognised at an early stage.⁷ They are considered to be the most common tumor of childhood, occurring in about 5–10% of children under one year of age exhibiting a rapid growth phase with endothelial proliferation, followed by gradual involution.⁸

Case Report

A 39-year-old female presented to the Ear Nose Throat out-patient department (ENT OPD) of Dhulikhel Hospital (DH) with complaints of mass in the posterolateral aspect of the right soft palate for one year. She added a history of nasal blockage and on and off type of bleeding from the growth. There was no history of pain or discharge from the growth.

On examination of the oral cavity, there was the presence of a mass measuring approximately 2x2 cm in the posterolateral aspect of the right soft palate extending towards the oropharynx. The mass was soft in consistency, non tender and compressible.

Based on the clinical evaluation, a diagnosis of palatal

haemangioma was made and surgical excision of the lesion was planned under general anesthesia. Intraoperatively, surgical excision couldn't be done due to the difficult location. Thus, the growth was removed using electrocautery. On one month followup, the lesion had completely shrunk with resolution of nasal blockage and bleeding.

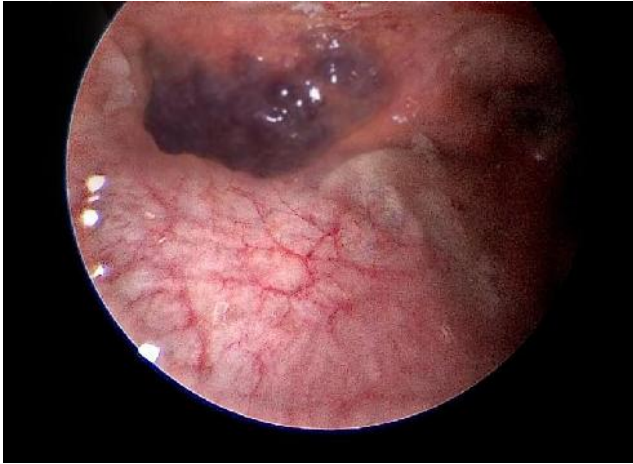


Figure 1. Hemangioma present over posterolateral aspect of right soft palate.

Discussion

Haemangioma are the most common benign vasoformative tumors of infancy and childhood.⁹⁻¹¹ These are benign tumors of the blood vessels and are classified according to their histopathological appearance as capillary, mixed cavernous, or sclerosing, a variety that tends to undergo fibrosis.⁷ Capillary haemangiomas can be sessile or pedunculated, soft, smooth or irregular, and bulbous in outline, and are painless unless traumatized. These haemangioma are composed of many small capillaries lined by a single layer of endothelial cells supported in a connective tissue stroma of varying density, while cavernous

haemangioma is formed by large, thin walled vessels, or sinusoids lined by epithelial cells separated by thin layer of connective tissue septa.⁹

The hemangiomas affect different areas of soft tissue of the body including oral mucosa and other head and neck areas, viscera and lumbosacral regions.¹⁰ Haemangiomas of the oral cavity may exist as small or large superficial growths with varying degrees of penetration into soft tissues or as monstrous growths extending to the esophagus. They may also be multicentric with a cobblestone appearance.¹¹ Those on the palatal mucosa are solely of the capillary type.⁷

Management of haemangioma depends on a variety of features and most haemangioma do not require any intervention.¹² Some of the haemangioma require intervention depending on the size, location, stages of growth and behavior. Haemangioma can be treated by surgical excision, intralesional injection of sclerosing agents, laser etc.¹² In our case, the haemangioma was cauterized electrically as its location was difficult to assess for its surgical excision.

Conclusion

Hemangiomas, prevalent in infancy, exhibit diverse histopathological features. Oral cavity involvement varies, necessitating individualized management. Surgical excision, sclerosing agents, or electric cauterization are employed based on specific characteristics.

Consent

Written informed consent was obtained ensuring patient's anonymity.

Declaration of competing interest

There are no conflicts of interest.

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Benign Mesenchymal Tumor Presenting as Lower Lateral Vaginal Wall Mass: A Case Report

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Abstract

Background

Benign mesenchymal tumors infrequently occur in the lower lateral vaginal wall, necessitating thorough examination and diagnosis. This report highlights diagnostic challenges, patient-specific considerations, and a surgical approach, contributing to scarce literature on managing such cases.

Case Presentation

We outline a case of a young patient with the diagnosis of leiomyoma presenting as lower lateral vaginal mass with a good clinical outcome following complete excision.

Conclusions

Leiomyomas in the lower lateral vaginal wall, rare but impactful, and present with varied symptoms. Diagnosis involves clinical exams and imaging. Tailored management considers symptoms and reproductive goals.

Keywords: Case report, dyspareunia, leiomyoma, vagina.

Introduction

Leiomyomas are benign mesenchymal neoplasms that can occur in the female genital tract, the uterus being the most common site. These tumors are thought to arise from müllerian smooth muscle cells in sub-epithelium of vagina.¹ Leiomyomas occur in 20-30% of women in the reproductive age group. Leiomyomas primarily occurs in vagina, are rare with only about 300 cases reported since the first case described in 1733.² The most common location of leiomyomas in vagina reported were in the anterior vaginal wall.^{3,4} We report a case of leiomyoma arising from right lateral vaginal

wall (inner to right medio lateral episiotomy site), presented with a lateral vaginal mass, associated with pain and dyspareunia.

Case Report

A 22 year old P2L2 lady, referred to our Gynecology OPD for mass in the perineal region for four months associated with pain and dyspareunia. Initially patient noticed a small mass in her right labia majora, which was gradually increased in size over two months period. It was associated with dull aching pain, which aggravated with sexual intercourse. There was no

history of abnormal vaginal discharge, itching, bleeding per vaginum. There was no urinary symptoms. Patient had regular menstrual cycles and was on Jadelle for family planning since last two years. She had both of her vaginal deliveries at home, which were uneventful and her last child was three years back.

Her general condition and systemic examinations were fair. On pelvic examination, there was a mass arising from right lower lateral wall of vagina (6*6 cm), which was firm in consistency and seems to be adhered to the right pubic bone (figure 2). On per vaginal examination, the right vaginal wall mass was extending to about 9 cm from the vaginal introitus with limited space between pubic bone and the mass. The mass was obliterating the vaginal canal and firmly adherent with the right pubic bone without any mobility. There were no surface lesions or bleeding from the mass. The uterus and adnexa were normal on bimanual examination, confirmed by transvaginal ultrasonogram. Her liquid based cytology report was within normal limits.

Ultrasound done at another center showed complex heterogeneous mass abutting pelvic bone, suspicious of bony origin and malignancy. Magnetic Resonance Imaging reported an approximately 6.6*5*5.2 cm sized, isodense mass in right side of perineum between perineal body and inferior pubic ramus. Lesion was occupying both the anal canal and the urogenital triangle. Medially it was abutting the bulbospongiosus, perineal body and external anal sphincter of rectum with loss of fat planes and laterally it was abutting the ischiocavernosus and obturator internus muscle with loss of fat planes between medial and lateral extent, the lesion was occupying the ischioanal fossa. There was no loss of fat stranding in the ischioanal fossa. No evidence of bony invasion seen. The lesion showed low

signal intensity of T1/T2 and high signal intensity on SPAIR with evidence of multiple internal flow voids. Post contrast study showed peripheral homogenous enhancement with mild heterogeneous central enhancement (Figure 1). The probable diagnosis from imaging was leiomyoma, but leiomyosarcoma could not be ruled out. Trucut biopsy was done and was reported as benign mesenchymal lesion. So she was scheduled for excisional biopsy.

The tumor was removed via vulvovaginal incision. Complete excision was possible with careful dissection (alike right medio lateral episiotomy incision), without damage to the anal sphincters (Figure 2 and video reference). The defect was closed in layers, to obliterate any dead spaces and anatomical restoration was achieved. Histopathology revealed the mass to be leiomyoma. Gross appearance showed bosselated, grey brown tissue measuring 7*4.5*5 cm, externally encapsulated and cut section showed a whorled appearance (Figure 3). Microscopy showed an encapsulated tumor with interlacing and intersecting bundles of smooth muscles (Figure 3).

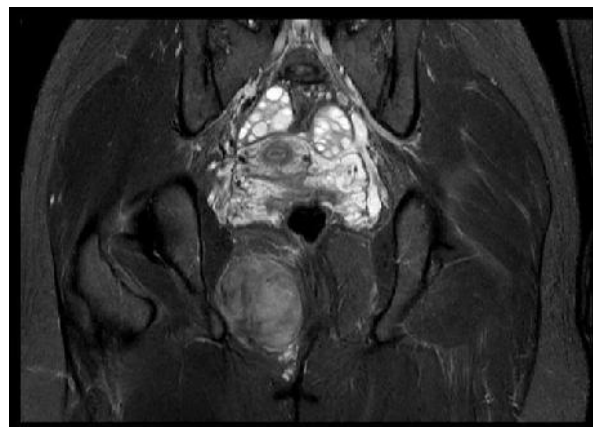


Figure 1. Magnetic resonance imaging of lesion



Figure 2. Preoperative, intraoperative and postoperative picture

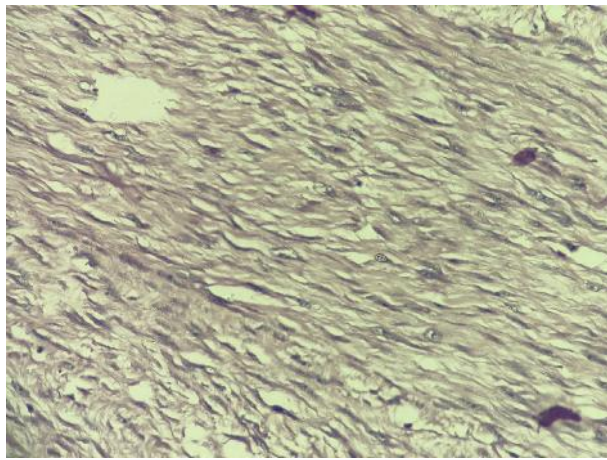
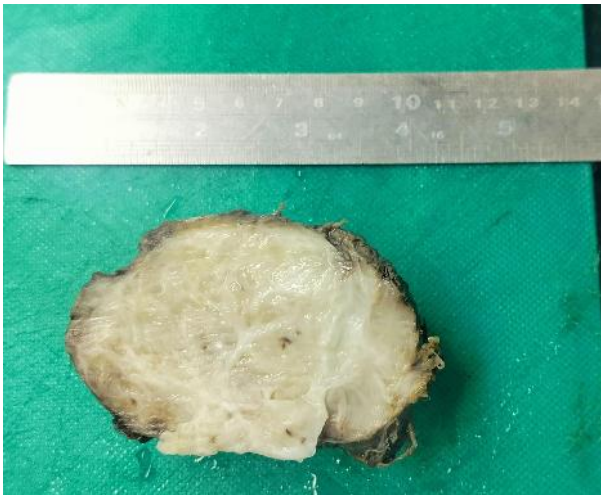


Figure 3. Gross and microscopic appearance of the lesion on histopathology

Discussion

Vaginal leiomyomas are very rare in occurrence. Vaginal leiomyomas are usually situated at the midline, anterior vaginal wall and less commonly from lateral and posterior vaginal walls.^{3,5} Vaginal leiomyomas are commonly seen in age group 35 to 50 years and are more common among caucasian women.⁶ These tumors are usually asymptomatic but can lower abdominal pain, dyspareunia, vaginal bleeding, dysuria or features of urinary obstructions, obstruction in birth passage if present along with pregnancy or feeling of bulging mass in vagina.⁷ These tumors can be intramural, pedunculated, solid or cystic. Usually they are benign,

single, slow growing but malignant transformations has been noted.⁸

Ultrasound is the first line imaging modality in American College of Radiology appropriateness criteria. Pelvic MRI is recommended if imaging is non diagnostic or inconclusive during transvaginal ultrasound. Magnetic Resonance Imaging is more reliable diagnostic tool in evaluating vaginal anatomy and vaginal disease due to soft tissue characterization and depiction of anatomical details.⁵ Vaginal leiomyoma typically appears as round homogenous lesion with similar signal to that of myometrium, with multiple calcifications.⁵ The absence of calcifications is a consistent finding in leiomyosarcomas. The presence of intralesional hemorrhage makes diagnosis of sarcoma more likely.⁹

Complete surgical removal through vaginal approach is treatment of choice, preferably with urethral catheterization to prevent urethral injury. Large tumors may require abdominoperineal approach.¹⁰ Preoperative planning is crucial with imaging. The approach must be decided and anticipated defects should be considered upon as there may be a need for reconstruction of large defects. Histopathological confirmation is the gold standard of diagnosis and rules out any possible focus of malignancy.

Conclusion

Vaginal leiomyomas are rare entities and preoperative diagnosis may be difficult. Transvaginal ultrasound and magnetic resonance imaging may demonstrate consistency of tumor and rule out normal tissue invasion. MRI may assist to delineate extent of lesion and plan surgical approach. Management of vaginal leiomyoma is a careful surgical excision and confirmation of diagnosis through histopathology. Histopathology confirms diagnosis and guides the need for further management.

Consent

Written informed consent was obtained ensuring patient's anonymity.

Declaration of competing interest

There are no conflicts of interest.

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Knowledge and Attitude on Surgical Safety Checklist among Operating Theatre Personnel in a Tertiary Level Hospital

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Abstract

Background

The Safe Surgery Save Lives program was established by the World Health Organization to reduce the number of surgical deaths. It included preventive strategies including checklists to prevent surgical errors. The aim of this study was to assess the knowledge and attitude on the aforementioned checklist and its association with selected variables among operating theater personnel.

Methods

A cross-sectional study was conducted from November to December 2021 among 117 operation theater personnel where convenience sampling technique was used to collect data using a self-administered questionnaire. Data was presented using descriptive and inferential statistics.

Results

Among 117 respondents, 55% had an average knowledge regarding surgical safety checklist. All respondents were aware about the availability of the checklist in the hospital. Among them, 53% had a positive attitude towards the checklist. There was no significant association between knowledge and attitude on the checklist with selected socio-demographic variables. There was weak positive correlation between knowledge and attitude regarding surgical safety checklist.

Conclusions

More than half of the respondents had an average knowledge regarding the World Health Organization's surgical safety checklist. This calls for a review by the hospital management committee since recent evidence reinforces the fact that knowledge and compliance with the checklist is critical for the positive effects on patient safety.

Keywords: *Attitude, checklist, knowledge, World Health Organization..*

Introduction

Surgery is the art and science of treating diseases, injuries, and deformities by operation which is carefully planned event or may arise with unexpected urgency.¹ Error in medicine has serious consequences so efficient preventive strategies such as checklists are necessary.²

WHO's Safe Surgery Saves Lives program aims to cut global surgical deaths, emphasizing the pivotal use of the WHO surgical safety checklist (SSC).³ Surgical phases include anesthesia induction (sign in), skin incision (time out), patient exit (sign out), with pre-operation checks at each step. The aim of the checklist was to reinforce safety practices, better communication, and teamwork between clinical disciplines.¹

There is growing evidence that the SSC can reduce postoperative morbidity and mortality.^{3,4} However, there are still many barriers to its correct use and implementation. This study assesses operating room personnel's knowledge and attitudes, revealing barriers to correct surgical safety checklist (SSC) use. Identifying gaps emphasizes the need for training and awareness to enhance safe surgery practices.

Methods

This was a prospective cross-sectional study conducted among all health personnel (nurses, anesthesiologists, surgeons, residents and medical officers) working in the operation theatre (OT) in Dhulikhel hospital, Kathmandu University Hospital between 1st November to 30th December 2021.

A total of 117 health personnel working in OT were included in the study. Those OT personnel who were not willing to participate in the study were excluded from the study. Convenience sampling technique was used to collect data and a written informed consent was obtained from the respondents before collecting data. A self-constructed and self-administered questionnaire was administered to the respondents which consisted of three sections; section I: demographic characteristics of the respondents, section II: questions related to the knowledge on SSC (12 items) and section III: statements regarding attitude towards SSC of the respondents (8 items). Correct answers were calculated to obtain total scores for knowledge regarding SSC. A score of less than 50% was considered poor, 50–79% fair, and 80% and above was considered as good.⁵

Data analysis was carried out using Statistical Package for the Social Sciences IBM version 20. Numbers, proportions, mean and standard deviation (SD) were calculated to describe the sample. Chi-Square and Monte Carlo test were conducted to find out the

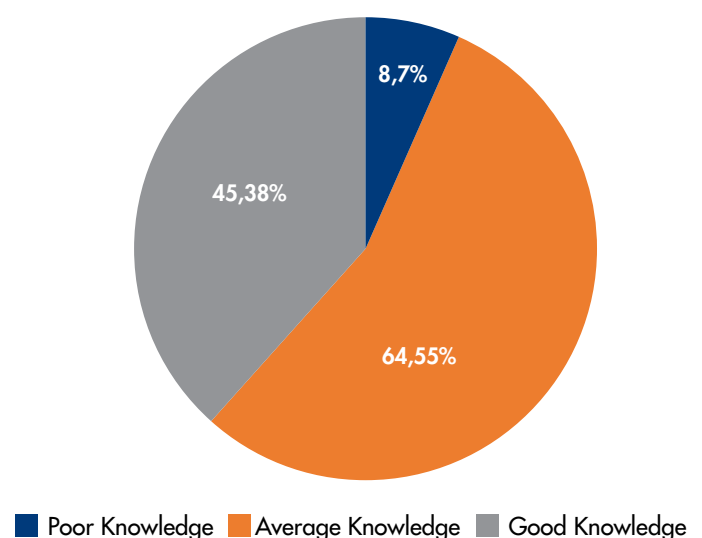
association between level of knowledge among OT personnel and selected socio-demographic variables. Pearson's correlation coefficient was calculated to find out the relations between knowledge and attitude of OT personnel regarding SSC. The level of significance was set at $P < 0.05$.

Results

Demographic characteristics of the respondents

During the study, 117 health professionals participated. Nearly 60% were under 28 years, with a mean age of 28.1 ± 5.8 years. The majority (68%) were female. In terms of qualifications, 48% held certificate levels. Professions included 50% nursing staff, 17% surgeons and residents, 6% anesthesiologists, and 10.3% medical officers. About 66% had 1-5 years of work experience (Table 1). All respondents were aware of the surgical safety checklist's availability in the hospital. Hospital protocols were the primary source (42%) of information, and 42% reported frequent use of the surgical safety checklist during their work.

Respondents' knowledge of the Surgical Safety Checklist (SSC) was gauged with 12 questions. Overall, knowledge was fair, with a mean score of 64.1%. About 55% demonstrated a fair level, 38% a good level, and 7% a poor level of knowledge on SSC (Figure 1). Participants excelled in areas such as SSC briefing and debriefing (97%), identifying potential critical events (93%), and recognizing improved communication with SSC use (93%). However, a notable knowledge gap (9%) was identified in the question about the part of the SSC where the team confirms patient identification (Table 2).



n: number; OT: Operating theatre; SSC: Surgical safety checklist

Figure 1: Level of knowledge on SSC among OT personnel in a Tertiary level hospital during November – December 2021 (n=117)

Table 1. Demographic characteristics of the respondents in a Tertiary level hospital during November – December 2021 (n=117)

Characteristics	Category	n	%
1. Age (Mean±SD 28.1±5.8 years)	<28	69	59.0
	≥28	48	41.0
2. Sex	Male	37	31.6
	Female	80	68.4
3. Qualification	Certificate level	56	47.9
	Bachelor level	33	28.2
	Master level	28	23.9
4. Profession	Surgeon	20	17.1
	Anesthesiologist	7	6.0
	Nursing Staff	58	49.6
	Residents	20	17.1
	Medical Officer	12	10.3
5. Work experience	<1 year	22	18.8
	1-5 years	77	65.8
	6-10 years	14	12.0
	≥11 years	4	3.4
Total		117	100.0

n: number; OT: Operating theatre; SD: Standard deviation

Table 2: Knowledge on SSC among OT personnel in a Tertiary level hospital during November – December 2021 (n =117)

Characteristics	Correct response	Incorrect response
1. Meaning of WHO SSC	58 (50%)	59 (50%)
2. True statement while conducting WHO SSC	95 (81%)	22 (19%)
3. SSC aimed at decreasing incidence of	68 (58%)	49 (42%)
4. True statement of SSC doing briefing and debriefing	114 (97%)	3 (3%)
5. Three parts of WHO surgical safety checklist	78 (67%)	39 (33%)
6. Confirmation of pulse oximeter with its functioning	85 (73%)	32 (27%)
7. Each team member will introduce him or herself by name and role in the phase	28 (24%)	89 (76%)
8. Why it is useful to discuss potentially critical events before surgery starts?	102 (87%)	15 (13%)
9. Which part of the SSC do the team confirm the patient identification?	11 (9%)	106 (91%)
10. Example of a potentially critical event that might be discussed during the SSC	109 (93%)	8 (7%)
11. The use of SSC has improved communication	109 (93%)	8 (7%)
12. Which part of the SSC team members confirmed about the administration of prophylactic antibiotics?	44 (38%)	73 (62%)

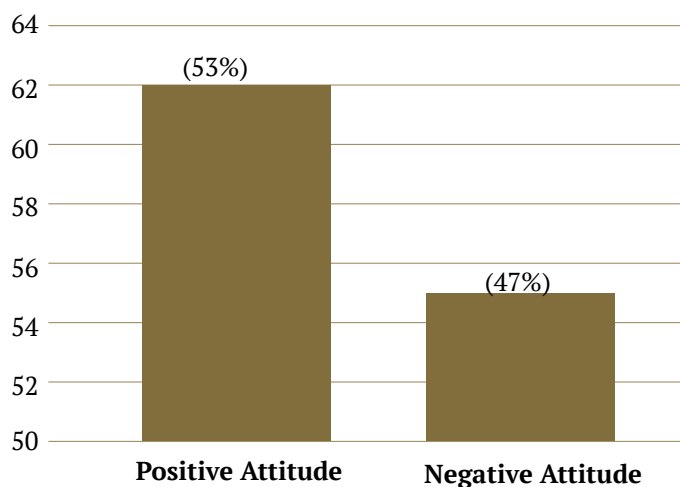
n: number; OT: Operating theatre; SSC: Surgical safety checklist

Respondents' attitudes toward the Surgical Safety Checklist (SSC) were assessed using an 8-item, 5-point Likert scale. A majority (53%) expressed a positive attitude, while 47% held a negative attitude (Figure 2). Sixty-six percent strongly agreed that SSC is highly useful. Additionally, 51% believed SSC aids in mistake prevention, while 46% disagreed with the notion that SSC causes delays. A significant portion (56%) agreed that they feel secure when SSC is employed during surgery.

No statistically significant associations were found between knowledge of the Surgical Safety Checklist (SSC) and selected demographic characteristics: age group ($p=0.437$), sex ($p=0.204$), and profession ($p=0.068$) (Table 3). Similarly, there were no significant associations between attitude toward SSC and selected demographic characteristics: age group ($p=0.234$), sex ($p=0.668$), qualification ($p=0.442$), profession ($p=0.408$), and work experience ($p=0.754$).

A statistically significant weak positive relationship ($r=0.29$, $p=0.001$) was observed between knowledge and attitude towards the WHO Surgical Safety Checklist

(SSC) among respondents. As knowledge about the WHO SSC increases, attitudes toward it tend to become more positive, although the increase is not substantial (Table 4).



n: number; OT: Operating theatre; SSC: Surgical safety checklist

Figure 2: Attitude toward SSC among OT personnel in a Tertiary level hospital during November – December 2021 (n=117)

Table 3: Association of demographic characteristics of the respondents with knowledge on SSC among OT personnel regarding in a Tertiary level hospital during November – December 2021 (n=117)

Characteristics	Poor Knowledge f (%)	Average Knowledge f (%)	Good Knowledge f (%)	p value
Age group				
<30 years	7 (8.4%)	47 (56%)	29 (34.9%)	0.437#
≥31 years	1 (2.9%)	19 (55.9%)	14 (41.2%)	
Sex				
Male	1 (2.7%)	18 (48.6%)	18 (48.6%)	0.204#
Female	7 (8.8%)	46 (57.5%)	27 (33.8%)	
Profession				
Doctors	1 (1.7%)	31 (54.2%)	26 (44.1%)	0.068#
Nursing staff	7 (12.1%)	35 (55.2%)	19 (32.7%)	

(#) Monte Carlo test; n: number; OT: Operating theatre; SSC: Surgical safety checklist

Table 4: Correlation between knowledge and attitude towards SSC among OT personnel regarding in a Tertiary level hospital during November – December 2021 (n=117)

Characteristics	Median (IQR)	r value	p value
Knowledge	8 (3)	0.29	
Attitude	34 (4)		0.001

IQR: Interquartile range; n: number; OT: Operating theatre; SSC: Surgical safety checklist

Discussion

This is the first study to provide a snapshot of the knowledge and attitude towards surgical safety checklist among OT personnel in Dhulikhel hospital. The study showed that all respondents were aware about the availability of the SSC in the hospital. Similar results were shown by Hurtado et al. (93.8%) awareness of the existence of the SSC in Guatemala City, Dangyangs et al. in Nigeria in 2016 and Upreti et al. in a teaching hospital, Nepal in 2021.⁶⁻⁸ It is suggested that efforts should be aimed at universal awareness and complete knowledge on why and how the checklist should be used.⁶

This study showed that the majority of the respondents (55%) had a fair level of knowledge regarding SSC. This is considered a low level compared to 75% good level of knowledge reported by the study conducted by Dangyangs et al. in Nigeria.⁷ Similar study conducted in Nepal had a comparable finding,⁸ whereas different finding was reported by Sharma et al. in North India (37% respondents had fair level of knowledge) and Patil et al. in India (78% have inadequate knowledge).^{9,10} The fair level of knowledge of the respondents in our study can be explained by the fact that there was a lack of training regarding the use of SSC in this hospital. No formal training sessions were conducted prior to introduction of it in the operating theater. furthermore, this could further have been linked with the unwillingness of staff to use the checklist, and lack of experience in using it.⁸ Complete knowledge of how the checklist has to be used and its goals has been strongly associated with effective implementation, consistent and correct use of the checklist.¹¹ Attempts should be made to educate all personnel to gain complete knowledge regarding the checklist. It can be improved by awareness programmers, in situ demonstrations, videos and focused training in the area where all items of the SSC could be introduced in a stepwise manner in the hospital. Besides teaching modules, posters, newsletters or computer screen savers can also be used as platforms for dissemination of information.⁹

Use of SSC involves multidisciplinary teamwork between anesthetists, surgeons, and nursing staff and the WHO recommends that it should be completed jointly by the team.¹² In comparison between doctors and nurses, nurses had relatively poor knowledge than doctors in our study. This could be a barrier to effective implementation and correct use of the SSC.¹¹ It is necessary to adequately educate nurses about its use and value. It is equally crucial to prevent differences in knowledge among operating theater workers from preventing the introduction of the SSC.⁸

The overall attitude of the respondents towards SSC

was positive. Similar finding was reported in the study conducted by Sharma et al. in India.⁵ Among the total respondents, 66.7% strongly agree that SSC is very useful. Sixty percent of respondents strongly agreed that SSC improves communication between staff. More than 50% of respondents disagree with the statement that checklists are unnecessary tick boxes because they believe that checklists can reduce complication and improve communication between team members. Evidence suggested several barriers for the effective implementation of checklists such as poor communication among physicians, ambiguity about the reasons for their application, ignorance of the avoidable risks and problems with the authority.¹³ It has been reported that while the physical act of “checking the box” may not necessarily prevent all adverse events, the checklist is a platform on which attitudes toward teamwork and communication can be encouraged and improved.¹⁴ Several studies advocated that teamwork in surgery leads to improved outcomes and reduced rates of adverse events significantly.¹⁵⁻¹⁷

Our study found that there was no significant association between level of attitude with selected variables age, sex, and profession and years of work experience. However, a study conducted by Patil et al. in India reported significant association between attitude towards SSC and years of work experiences of the respondents.¹⁰ Another online survey by Vohra et al. in UK also reported significant association between attitude towards SSC and age, sex, and profession of the respondents.¹⁸ The differences in results can be due to variation in the study setting, population, time, and duration.

The correlation of the overall median knowledge and median attitude of OT personnel was found to be significant with a weak positive relationship between knowledge and attitude regarding SSC. Similar finding was reported in the study conducted by Patil et al. in India.¹

The study limitation includes that there was no information on the compliance of SSC use and/or factors influencing SSC implementation in OT and we did not conduct an in-depth analysis and research on the underlying factors. There are a number of other variables that need to be further explored. Studies of such variables and applying interventions to improve operating personnel’s compliance of the SSC use would support the further improvement of SSC implementation.

Conclusion

This study reveals that over half of the respondents possess an average knowledge level of the WHO Surgical Safety Checklist, and their overall attitude is

positive. This emphasizes the importance of a review by the hospital management committee. Recent evidence underscores the crucial role of knowledge and compliance with the checklist in enhancing patient safety and preventing avoidable complications. Initiating an awareness program or training on the standardized surgical safety checklist for both staff and users in the hospital is essential. Effective implementation aligns the hospital with WHO recommendations. The study's results outline specific goals and underscore the need for ongoing research and continuous quality improvement.

Ethical Approval

Approval from the Institutional Review Committee (IRC), Kathmandu University School of Medical

Sciences (KUSMS), Nepal (IRC 150/2021) was obtained to conduct the study.

Declaration of Competing Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

Acknowledgement

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Painful Cyclical Bleeding from Abdominal Scar: A Case of Caesarean Scar Endometriosis

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Abstract

Background

Endometriosis is defined as the presence of endometrial glands and stroma outside the uterine cavity. Extra pelvic endometriosis is rare entity and this constitutes 0.03% to 1.7% of reproductive age women. The incidence of caesarean scar endometriosis is 0.03-0.4%. A very rare presentation of scar endometriosis is cyclical bleeding on abdominal scar.

Case Presentation

A 29 year old para 2 living 2 female with history of previous two caesarean section presented to gynecological OPD with complain of bleeding from caesarean scar for last 6 months.

Conclusions

Presentation of endometriosis varies and specifically for abdominal scar endometriosis, the presentation could be cyclical pain, swelling and in rare cases cyclical bleeding from abdominal scar. Treatment of choice is wide excision of lesion. Cyclical bleeding from previous scar is a rare presentation of scar endometriosis. Timely diagnosis and surgical intervention improve patient's quality of life.

Keywords: *Caesarean Section, Case report, Endometriosis.*

Introduction

Endometriosis is defined as the presence of endometrial glands and stroma outside the uterine cavity with incidence of 10-15% of reproductive age women.¹ This can occur anywhere in the body including abdomen commonly. Extra pelvic endometriosis is rare entity and constitutes between 0.03% to 1.7% of reproductive aged women.² Extra abdominal sites include lungs kidneys, bladder, omentum, bowels, lymph nodes and abdominal wall including previous scars (commonly caesarean scar).³ Caesarean scar endometriosis is

not usual presentation of extra-pelvic endometriosis with estimated incidence of 0.03-0.4%.⁴ The common presentation of caesarean scar endometriosis is pain, swelling, tenderness with every menstrual cycle. A very rare presentation of scar endometriosis could be cyclical bleeding via the abdominal scar which may be associated with abdominal pain at the particular site. Some of these may be misdiagnosed; misdiagnosis may lead unnecessary intervention and irrelevant treatment. This article aims to review rare presentation of caesarean scar endometriosis.

Case Report

29 Years Female on her 5th day of menstrual cycle presented on August 2022 to gynecological outpatient department in College of Medical Sciences, Nepal with complain of bleeding from cesarean scar for last 6 months. Bleeding is slight in amount and occurs during every menstrual cycle which is very painful at the scar site. The amount of bleeding from the caesarean scar is increased in last 6 months. She denies history of any trauma, bleeding from any other site/ gum bleeding/ epistaxis/ blood in urine or stool. She is a para 2 living 2 lady with history of previous 2 caesarean section, first one done for gestational hypertension/ preeclampsia 10 years back and second one done for previous caesarean section 7 years back. There is no other significant medical history. She has visited different doctors and hospitals for the particular complaint, she was then referred to a surgeon where radiological diagnosis of abdominal wall sinus was made and further investigations including MRI scan was advised. No conclusive diagnosis was made via MRI scan, she was then advised for Fine Needle Aspiration Cytology (FNAC) that made a provisional diagnosis of endometriosis, abdominal wall and she presented to us. She also used to take analgesics for the pain during menstrual cycle.

Examination showed lower midline vertical scar extending from lower border of umbilicus to pubic symphysis. This scar was blood stained at around midpoint (Figure 1). Palpation revealed a nodule of around 2x2 cm around 4 cm below the umbilicus in midline which was firm, slightly tender with no mobility.



Figure 1. Blood stained cesarean scar.

Investigations were within normal limits. The provisional diagnosis of Caesarean scar endometriosis was made and she was planned for excision of the scar endometriosis. Wide excision of caesarean scar endometriosis was done. Post operative sutures were removed on 10th post operative day (Figure 2 and Figure

3). On cross section of specimen, it showed presence of chocolate colored blood within the specimen which confirmed the symptom of cyclical bleeding through the scar (Figure 2).

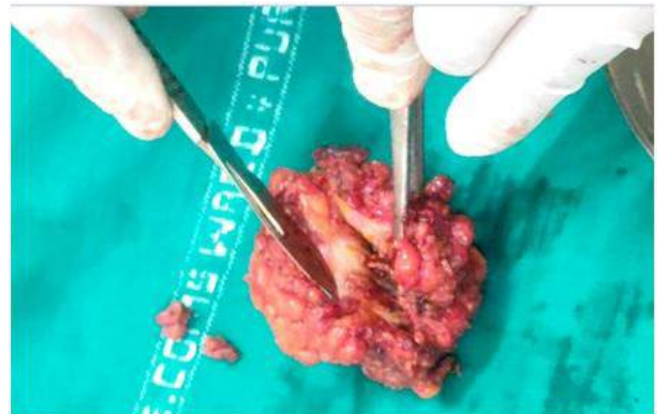


Figure 2. Excised scar endometriosis.



Figure 3. Postoperative wound.

Hematoxylin and Eosin stain photomicrograph of excised specimen is shown in Fig 4. This image shows the presence of endometrial glands in the specimen which is unusual, thus confirming the diagnosis of Caesarean scar endometriosis. Endometriosis is defined as the presence of endometrial glands and stroma outside the endometrium. This picture shows presence of endometrial glands at periphery and in between the tissues.

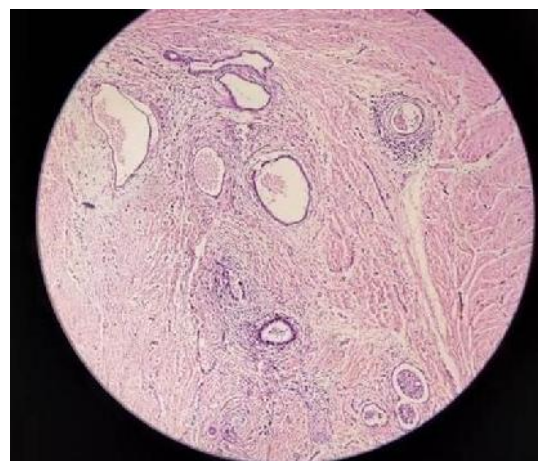


Figure 4. Histopathology of specimen showing endometrial glands.

Discussion

Endometriosis as explained is the presence of endometrial glands and stroma outside the endometrial cavity. Endometrioma is the well circumscribed mass of endometriosis. Presentation of endometriosis varies and specifically for abdominal scar endometriosis/endometrioma, the presentation could be cyclical pain, swelling and in rare cases cyclical bleeding from abdominal scar. Scar endometriosis can occur after any gynecological surgeries, the most common being after surgery on uterus and fallopian tube. Incidence of scar endometriosis after hysterotomy is 1.08-2 % whereas after caesarean section is 0.03-0.4%.⁵ The reason for higher incidence after hysterotomy is because early decidua has more pleuri-potential capabilities and can result in cellular replication producing endometriomas.⁶

The most common acceptable theory for cause of caesarean scar endometriosis is mechanical iatrogenic implantation.⁷ Endometrial glands and cells are inoculated at the surgical site; these cells via the action of estrogen proliferate slowly with every menstrual cycle leading to significant size of growth of endometrium at surgical/ caesarean scar. Other explanation of the cause of scar endometriosis is the transfer of endometrial tissue via vascular and lymphatic pathways to the abdominal scar.⁸ Interval between presentation and surgical procedure varies from 3 months to 10 years.⁹ In this case also the same interval is of 6 months.

Fine needle Aspiration Cytology (FNAC) has been reported to be accurate in diagnosis but in a recent report by Dwivedi et al. FNAC was not diagnostic in any of 4 patients that underwent this procedure.^{10,11} In this case FNAC was done 5 months before presenting to us and the diagnosis of abdominal wall endometriosis was made with advice for excision biopsy.

The cyclical hemorrhage resulting from hormonal influence during menstrual cycle is a diagnostic criteria for scar endometriosis.^{12,13} Primary cutaneous endometriosis can also lead to brownish colored mass with bleeding during menstruation cycle.^{13,14} A study done by Malutan et al. revealed that bleeding from mass in endometriomas was only present in 1 out of 14 studied patients (7.14%) which is one of the rare presentation of this condition to consider.⁴

Treatment of choice is wide excision of lesion and may sometimes require for mesh placement. Medical treatment with the use of progestogens, oral contraceptive pills and Danazol is not effective and gives only partial relief in symptoms.⁶ All endometriomas including scar endometriosis has potential to be malignant, although rare 0.3 to 1% for scar endometriosis and the commonest histological subtype is clear cell carcinoma.¹⁵

Conclusion

Scar endometriosis is a rare diagnosis to consider and this should be suspected in any patient presenting with complain of pain, swelling and bleeding from previous surgical site. Cyclical bleeding from previous surgical scar could be a rare presentation of scar endometriosis. Timely diagnosis and surgical intervention improve patient's quality of life.

Consent

Written informed consent was obtained ensuring patient's anonymity.

Declaration of competing interest

There are no conflicts of interest.

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Umbilical Hernia Repair under Bilateral Rectus Sheath Block: A Case Report

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Abstract

Background

Anesthetic management of patients with impaired left ventricular function undergoing noncardiac surgery is a challenge. These patients are at increased risk of perioperative hemodynamic instability, acute coronary events, and major cardiac events.

Case Presentation

We report a case of a 60 years old woman with coronary artery disease with left ventricular dysfunction planned for elective umbilical hernia repair who was managed with bilateral rectus sheath block as a sole anesthetic.

Conclusions

The bilateral rectus sheath block offered a stable hemodynamics and an adequate anesthesia for the surgery.

Keywords: Case Report, Coronary Artery Disease, Left Ventricular Dysfunction, Nerve Block, Umbilical Hernia, Regional Anesthesia.

Introduction

An umbilical hernia is the protrusion of intra-abdominal contents like omentum or bowel through an opening in the muscles of the abdominal wall situated at or near the umbilicus, affecting approximately 2% of the population. Open umbilical hernia repair is a common procedure conventionally performed under general anesthesia. Bilateral rectus sheath block is commonly performed to provide supplemental analgesia for this procedure. We here describe the clinical case of a patient for an umbilical hernia with cardiac comorbidities and who was successfully operated under bilateral rectus sheath block as a sole anesthesia.

Case report

A 60-year-old lady with umbilical hernia containing a part of the omentum was planned electively for surgery. She was planned for open anatomical repair of umbilical hernia. She had hypertension with multiple incidence of myocardial infarction over 10 years last attack 3 years back and was under aspirin, atorvastatin, enalapril, isosorbide mononitrate, furosemide, spironolactone and metoprolol. She had no previous surgeries. She had no documentation of her last angiogram which was done 3 years back.

The patient does not give any history suggestive of heart failure. Her metabolic equivalent (METs) was >4.

On examination, she was found to have mild bipedal pitting edema. The biochemical analysis, coagulation profile and chest radiograph were normal. Her electrocardiograph showed symmetrical T inversion extending from V1 to V5. Her recent cardiac markers were normal. Echocardiography reported hypokinetic left anterior descending (LAD) artery territory with aneurysmal apex, mild mitral regurgitation (MR), moderate LV diastolic dysfunction with left ventricular ejection fraction (LVEF) 30-35%. The umbilical hernia had a 11.4mm diameter defect in the anterior abdominal wall with protrusion of mesentery.

Anatomical repair was planned under bilateral rectus sheath block. The patient was advised to continue all her regular medications including aspirin.

Standard operating monitoring which included electrocardiography, pulse oximetry and non invasive blood pressure measurement was performed. Intravenous access was secured with 20 G cannula in the forearm. Under all aseptic precaution, the rectus sheath block was performed bilaterally with real time ultrasonographic guidance using 22 gauge (100mm) needle using linear transducer via in-plane approach. 0.25% ropivacaine 15ml each in the space between the rectus abdominis and the posterior rectus sheath. (Figs. 1a & b).

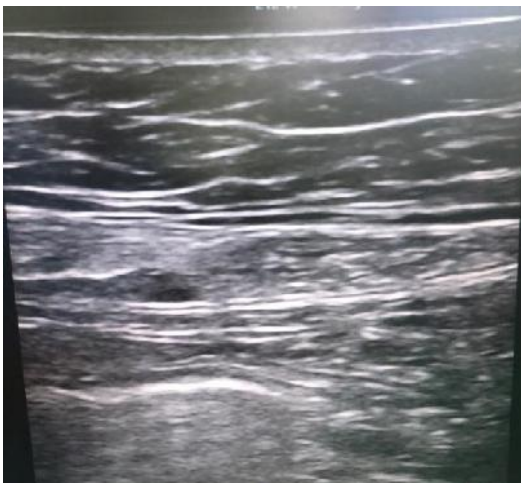


Figure 1a: Rectus abdominis muscle.

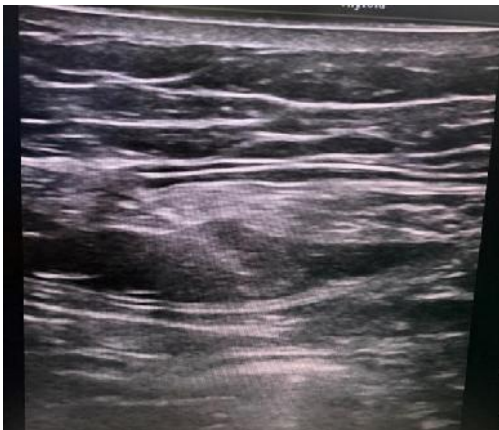


Fig 1b: Local anesthetic deposited between rectus abdominis muscle and posterior rectus sheath.

After ensuring adequate block at 10 minutes, surgery was started. A small transverse infra-umbilical incision was given above the swelling. The surgical procedure took place uneventfully. The duration of the surgery was 80 minutes and the patient was comfortable throughout this period. No additional opioids or sedation was supplemented.

She did not require other analgesics in post anesthetic care unit and was discharged to ward from the hospital after 3 hours of surgery without any complications.

Discussion

Left ventricular systolic dysfunction refers to a ventricular ejection fraction (LVEF) of less than 50% by echocardiography.¹ Our patient had moderate to severe left ventricular systolic dysfunction (LVEF =30%) associated with coronary artery disease (CAD) involving the left anterior descending artery territory. Patients with CAD undergoing noncardiac surgery are at increased risk of perioperative cardiac events demanding intense anesthetic management.²

Perioperative hemodynamic goals for the above cardiac pathology is to limit preload, avoid increases in heart rate, maintain myocardial contractility, decrease afterload, and maintain oxygen demand delivery balance.

Most anesthetic agents that we routinely use causes significant reductions in LVEF.³ Hypotension and volume overload could potentially precipitate myocardial ischemia in our patient.

A sensory block from T9-T11 is required for the operative procedure.⁴ Jyotsna Bhargava et al⁵ successfully managed a case of severe LV dysfunction with obstructed umbilical hernia with thoracic epidural anesthesia. Neuraxial anesthesia is generally chosen over general anesthesia because there is reduction of left ventricular after load, avoidance of sympathetic stimulation on airway management and better perioperative pain management.

Abdominal wall blocks are an attractive alternative to spinal anesthesia where possible. It avoids hypotension, motor block, and neuraxial hematoma⁶. Various abdominal wall blocks like transversus abdominis plane block, rectus sheath blocks have been used for perioperative analgesia in many surgeries involving the abdomen.^{7,8} The blocks were first described in 1899 by Schleich.⁹ Umbilical hernia repair was first successfully performed under rectus sheath block by Ferguson in 1996.¹⁰ It provides somatic analgesic effect to the anteromedial abdominal wall and periumbilical area by blocking nerve conduction at the terminal branches of T9 to T11, but excludes innervation to the viscera.

Surgery in our case was limited to the abdominal wall, hence, feasible for the procedure as the sole anesthetic. Quek et al¹¹ describes periumbilical hernia performed under bilateral rectus sheath block and highlights the advantages offered by the block for a severely reduced LVEF.

Conclusion

Abdominal blocks can serve as a sole anesthetic for surgeries involving the abdominal wall and it is especially advantageous for patients who have limited cardiovascular reserve.

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Leech as an Unusual Foreign Body in the Subglottis: A Case Report

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Abstract

Background

Leeches, hemophagic parasites with distinctive striped bodies, infest hosts by attaching to fish, amphibians, or mammals. Human infestation can occur through water exposure, potentially leading to severe respiratory complications.

Case Presentation

We present a case of a 67-year-old man who presented with a persistent nonproductive cough, voice fatigue, and crawling sensation after drinking water from an open channel bamboo system in a hilly area.

Conclusions

Rare airway infestations, like leeches, demand prompt diagnosis and intervention. Endoscopic methods, particularly nasofibroscope and rigid bronchoscopy, prove crucial. Preventive hygiene measures, including avoiding untreated water, remain essential.

Keywords: *Airway Foreign Body, Bronchoscopy, Case Report, Leech.*

Introduction

The leech is a hemophagic parasite, living on occasional meals of blood obtained by attaching to fish, amphibians, and mammals. Infestation occurs by drinking water from quiet streams, pools, and springs. They attach to their hosts and remain there. Leeches possess 34 body segments, featuring a distinctive brown and red striped pattern on an olive background. They have two suckers—posterior for leverage and anterior, housing the jaw and teeth, for feeding.¹ They can enter the human body when people swim in contaminated streams or drink infested water. Leech infestation may cause serious complications like lethal dyspnoea, hemoptysis, or haematemesis. A

leech has been found in the nose, post-nasal space, and oropharynx, but rarely in the hypopharynx or larynx. A few cases of leeches in the hypopharynx or larynx have been reported in the literature during the past years.² This case report is intended to give clues for considering leeches as a cause of unexplained upper airway obstruction.

Case Report

A 67-year-old man resident of a hilly area came to OPD of our Institution with complaints of persistent nonproductive cough, voice fatigue, and persistent crawling sensation 2 months after he had quenched

his thirst from an open channel bamboo system for drinking water. On the same day, one of the leeches was coughed out immediately after drinking water. However, his symptoms were persistent in the subsequent days.

Because of persistent symptoms, he visited our center. He was a well-nourished man with normal vital parameters and saturation was 96% at room air. Chest radiograph (CXR) was unremarkable. On doing a nasopharyngolaryngoscopy, a black, mobile, live leech, just below the glottis was visualized (Figure 1).



Figure 1: Leech in the subglottis.

We planned to remove the leech with a rigid bronchoscope. After obtaining full informed consent and after appropriate 'nil-oral' hours, he was sedated with general anesthesia. An adult rigid bronchoscope was inserted orally to visualize and negotiate the glottis. The 'foreign body' was confirmed to be a leech indeed (Figure 2).



Figure 2: Leech removal by bronchoscope.

With the tip of the scope at the level of the glottis, a forceps was inserted via bronchoscope and the wiggly leech was grasped successfully. The leech was 6 cm in length (Figure 3). His airways were reevaluated to rule out the distal residence of other leeches. Both of his bronchial trees were normal up to the subsegmental level (Figure 4).



Figure 3: Leech after removal using bronchoscope.



Figure 4: Clear airway after leech removal.

The procedure was uneventful and he noted a marked relief in symptoms and was discharged a day later.

Discussion

Leech is a common name for over 650 species of carnivorous, blood-sucking annelid worms that make up the class Hirudinea of Phylum Annelida. They are equipped with a large and small sucker. The mouth is located on the small sucker and has three jaws with sharp teeth that make a Y-shaped incision in the flesh.

The leech can ingest an amount of blood approaching 10 times its own weight and may not require feeding for up to one year after its last meal. This occurs after biting the host; a process that is pain-free due to a local anesthetic in the leech saliva.¹ Leeches saliva contains an anticoagulant enzyme named hirudin and a histamine-like vasodilator that both promote bleeding which manifests clinically as epistaxis, hemoptysis, or hematemesis.³ Leeches are segmented worms that are generally found in streams, pools, and springs.

Exposure leading to their attachment to one or the other

parts of the human body (also called hirudiniasis) is a common occurrence in the wilderness.⁴ The diagnosis is made sooner if the history includes drinking from infested waters, as in our case he reported to us that he drank water from a bamboo channel system and also gave a history that one of the leeches was coughed out immediately after drinking water.

A foreign body in the respiratory tract should be considered an emergency condition that requires immediate measures against the possibility of hypoxia and even death. Internal attachment of leeches in different areas of the human body such as the pharynx, larynx, bronchi, nose, and rectum have been reported in the literature. Agin et al. reported nasopharyngeal leech infestation with epistaxis and hematemesis.⁵

The treatment of choice for laryngeal leeches is removal under general anesthesia with sevoflurane for induction. It is crucial to remove the parasite in a single piece. If the head of the leech remains in the mucosa, the hirudin enzyme may still be active leading to blood loss and subsequent anemia.

To that end, the leech is first anesthetized with sevoflurane and then removed gently from a hypopharyngeal or laryngeal location avoiding trauma or mucosal edema. Lidocaine can also be used to relax the head suckers and substantially facilitates removal.⁶⁻⁸

The last maneuver of the procedure should be a meticulous inspection of the entire laryngeal region

Conclusion

Alive creatures in the airway are infrequent occurrences. Presentation can be delayed. Endoscopic measures are useful in diagnosis and treatment. Leeches should be suspected as an airway foreign body in patients with a recent history of drinking river or stream water, it should be diagnosed and treated promptly to avoid disastrous outcomes. Nasofibroscope makes a definite diagnosis to detect a leech in the larynx. Rigid bronchoscopy is the procedure of choice to extract it. Prevention remains the best treatment for such cases based simply on hygiene measures like not drinking river water directly and drinking only filtered water.

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Meningovascular Syphilis in a Young Female: A Case Report

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Abstract

Background

Meningovascular syphilis is a rare manifestation of syphilis caused by an inflammatory endarteritis that leads to luminal obstruction (rarely aneurysm develops) of the blood vessels supplying the leptomeninges, brain and spinal cord resulting in infarction of distal neural tissues. This makes a combined syndrome of chronic syphilitic meningitis, cerebrovascular and/or myelovascular events.

Case Presentation

We present a case of 20-year-old unmarried female with prodromal symptoms followed by features of stroke, which was later diagnosed as meningovascular syphilis.

Conclusions

In the era of antibiotics, very few studies regarding meningovascular syphilis have been reported. Given the low incidence of MVS and the possibility of it being misdiagnosed as other causes of stroke, a high index of suspicion is crucial, particularly in young adult patients with CNS sign or symptoms and history of painless genital lesions.

Keywords: *neurosyphilis, infarction, stroke.*

Introduction

Luminal obstruction of the arteries supplying the leptomeninges, brain, and spinal cord causes distal neural tissue infarction in meningovascular syphilis (MVS).^{1,2,3} This results in a mixed syndrome of chronic syphilitic meningitis, cerebrovascular, and/or myelovascular events.² Few studies highlighting meningovascular syphilis have been reported in the era of antibiotics. We present a case of a 20-year-old

unmarried girl with prodromal symptoms and stroke-like characteristics who was ultimately found to have meningovascular syphilis.

Case Report

A 20-year-old unmarried female came to our hospital with sudden onset of dull headache, localized to the parietal area. The patient also complained about dizziness, nausea, vomiting, and orbital ache. She had a history of several episodes of vomiting which

was watery without bile or blood. The patient denied having a fever, blurring of vision or any history of trauma, diabetes or hypertension. According to the patient's mother, eight months prior, she had a painless lesion over her genitalia characterized as itchy which healed spontaneously after 2 months in the absence of treatment. She had visited emergency previously 2 weeks back with similar symptoms which was relieved with pain killer. The patient had altered sensorium as confusion, disorientation, amnesia, nervousness, personality changes, hostile attitudes, aggressive behaviors, hallucinations, and illusions. Her Temperature was 98.9 degrees Fahrenheit, pulse was 100 beats per minute, respiratory rate was 20 breaths per minute, blood pressure was 110/90 mm of Hg, and saturation was 94% in room air. Pupils were equal, dilated at 4mm, and reactive to light. She was disoriented to time, place and person. On motor examinations, bulk tone and power of both upper and lower limbs are within the limit. The plantar reflex and other reflexes were intact. Sensory examination could not be performed. Besides the neurological examination, the rest of the system examination yielded no significant findings.

Initial laboratory investigations included routine complete blood count (CBC), renal function test (RFT), liver function test (LFT) which were non-significant. Basic metabolic panel reports were within normal range. However, the patient's TSH was elevated to 16.28 mU/L (milliunits per liter). Her Vitamin B12 level was decreased to 143 ng/L (nanograms per liter). MRI Brain was performed which showed evidence of diffusion restriction at the posterolateral aspect of the left thalamus-likely to be an acute infarct [Figure 1]. MRI finding suggested an ischemic stroke. Serology tests for HBsAg, HCV and HIV were non-reactive. Since she gave history of genital lesion in the past, serum rapid plasma reagin (RPR) was sent which came out to be positive which was further confirmed by Treponema pallidum hemagglutination assay (TPHA). She underwent lumbar puncture and cerebrospinal fluid was collected for analysis. CSF Total count was 79 cell/cum with Lymphocytes predominant i.e., 100% which are illustrated in (Table 1).

Table 1. Cerebrospinal Fluid analysis.

Parameter	Result
Volume	1 ml
Color	watery
Transparency	Clear
Total WBC count	79 cells/cum

Differential counts	
Neutrophils	00
Lymphocytes	100
Monocytes	00
Eosinophils	00
Basophils	00

Biochemical and microbiological tests for CSF analysis showed remarkable protein level, prominently low glucose level with plenty of pus cells. No organisms were visualized on gram stain. Culture and sensitivity yielded no growth after 48 hours of incubation. Acid-fast Bacilli stain was negative. The Venereal Disease Research Laboratory (VDRL) test on CSF analysis was reactive. CSF PCR qualitative analysis were tested negative for HSV-1 DNA and HSV-2 DNA. The results are illustrated in (Table 2).

Table 2. Biochemical and Microbiological tests for CSF analysis.

Tests	Result	Reference Range
Protein CSF	155 mg/dl	Adult < 60 years: 15-45; Adult >60 years: 30-60;
Sugar, CSF	10 mg/dl	40.0 - 80.0
ADA	9 U/L	Serum: < 18.0 Pleural fluid: <33.0 Ascitic Fluid: < 30.0 CSF: <10.0
Gram Stain	Pus cells have plenty/ no microorganisms	
Culture and Sensitivity Report	No growth after 48 hours of incubation at 37 degrees Celsius	
AFB Stain	No Acid-fast bacilli seen	
VDRL	Reactive	
CSF HSV- 1 and HSV-2 DNA PCR	Negative	

Patient was admitted in ICU with provisional diagnosis of acute ischemic infarct with meningoencephalitis. On the day of admission, Empirical antibiotics regimens were commenced. She was given ceftriaxone, Acyclovir and vancomycin and the next day ampicillin was added to the existing antibiotic regimen. She was managed with aspirin along with atorvastatin on view of acute ischemic infarct. She was managed with Levothyroxine

75 milligram for hypothyroidism and supplemented with methyl cobalamin 1000mcg for Vitamin B12 deficiency. Patient was managed with above mentioned drugs. However, after CSF reports, antiviral and other antibiotics were held except ceftriaxone. In view of stroke at a young age, other investigations like RA factor, ANA, Serology for HIV, HCV, hepatitis B, natural anticoagulant level and vasculitis markers were sent (Table 3).

After VDRL and TPHA reports, the patient was diagnosed with neurosyphilis particularly meningovascular neurosyphilis.

Table 3. Biochemical and Microbiological tests for Serum analysis.

Parameters	Patient's value	Reference
RA factor	Negative	
ANA	Negative	
HIV	Non-reactive	
Hepatitis B	Non-reactive	
HCV	Non-reactive	
Protein S Functional/ Activity	22	55-123
Protein C, Functional	>155	70-140
Homocysteine	6.90	4.44-13.56
c-ANCA	Negative	
p-ANCA	Negative	

Despite our best efforts, we were unable to provide our patient with crystalline penicillin because it was not readily available in our country. Patient initially showed some improvement with ceftriaxone and steroids but eventually her condition deteriorated. The patient's condition deteriorated on day 14 after admission. Following a generalized tonic-clonic seizure, the patient's GCS score was E2V3M2. The seizure was treated with midazolam, and the patient was immediately intubated and managed with medications. A repeat MRI was planned, but unfortunately, it could not be performed on the same day. Her pupil was dilated to 4.5mm. Babinski's sign was positive. One day after intubation, a brain MRI with MRA contrast was done which demonstrated tonsillar herniation, effacement of visualized sulci and cisterns and diffuse high signal intensity in cerebral and cerebellar cortex consistent with diffuse brain oedema (Figure 2). The patient's vitals and GCS got

deteriorated. In time, she passed away.

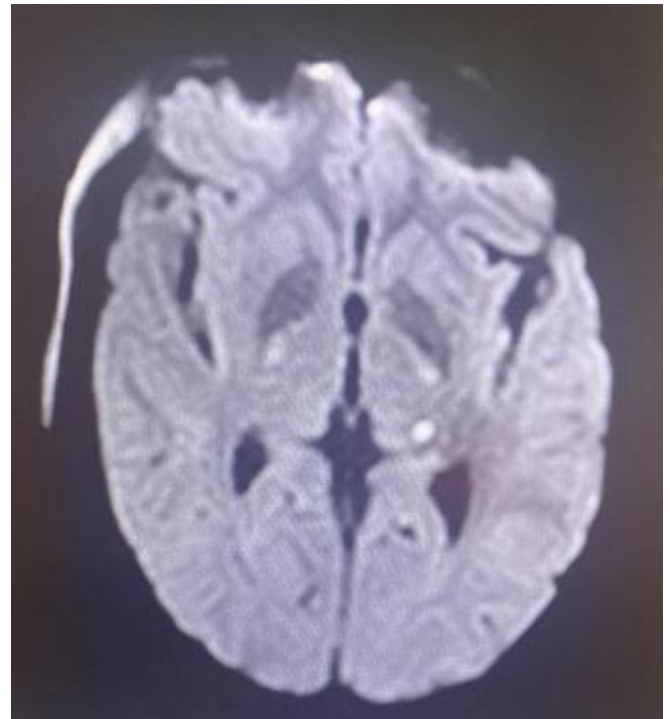


Figure 1. Axial DWI image shows diffusion restriction at posterolateral aspect of left thalamus s/o infarct.

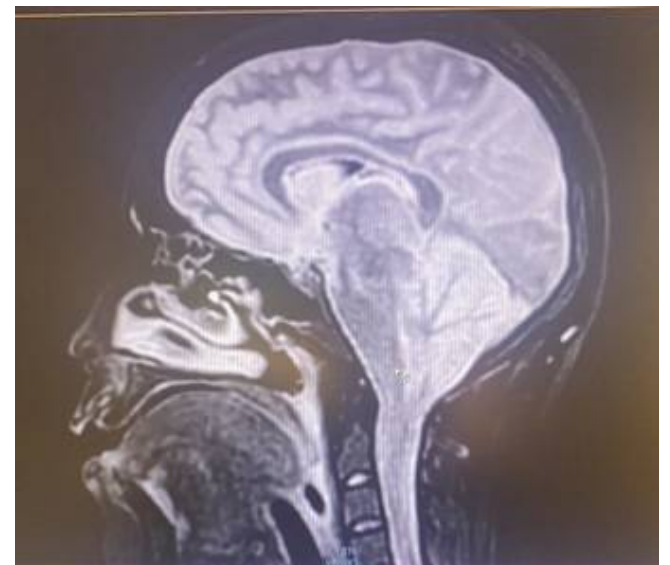


Figure 2. Sagittal FLAIR image shows tonsillar herniation, effacement of visualized sulci and cisterns and diffuse high signal intensity in cerebral and cerebellar cortex consistent with diffuse brain oedema.

Discussion

According to WHO, incidence and prevalence of syphilis were 19.9 million and 6.3 million respectively in adolescents and adults aged 15 to 49 years.⁴ *Treponema pallidum* elicits innate and adaptive cellular immune responses with lesional infiltration of polymorphonuclear leukocytes which are replaced by T lymphocytes later.⁵ The initial clinical manifestation of syphilis is a localized painless, indurated skin lesion called "chancre".⁶ Our patient also had had a chancre

which was itchy on her genital before she developed neurosyphilis. Chancre usually heals on its own within three to six weeks even in the absence of treatment.⁷ The exact mechanism of healing is unknown.⁷ In our patient, the painless genital lesion got healed spontaneously in the absence of treatment.

Neurosyphilis begins when treponema invades cerebrospinal fluid (CSF).^{8,9} The organism can be isolated from the CSF in nearly one-quarter of untreated patients with early syphilis.^{8,9} The more abnormal the CSF in asymptomatic meningitis, the more likely that symptomatic neurosyphilis would develop.¹⁰ Our patient also did have asymptomatic meningitis with abnormal CSF. Study of nonhuman primates infected with *T. Pallidum* showed that the number of CSF CD4+ T cells and the amount of gamma-interferon produced by CSF lymphocytes are consistent with a "Th-1-type" cellular immune response.¹¹ Neurosyphilis was common in the pre-antibiotic era wherein approximately one-third had asymptomatic neurosyphilis, one-third had tabes dorsalis, and at least 10 percent had meningovascular syphilis.^{1,6}

Meningovascular syphilis(MVS) is caused by an inflammatory obliterating endarteritis and subsequent luminal obstruction(rarely aneurysm develops) of the blood vessels supplying the leptomeninges, brain and spinal cord leading to distal neural tissue infarction.^{1,2,3} This makes a combined syndrome of chronic syphilitic meningitis, cerebrovascular and/or myelovascular events.² Around a quarter of patients with MVS have prodromal symptoms like intermittent headaches, vertigo, insomnia or behavioral changes prior to the ischemic event.^{2,12} The patient presented to the emergency department on two occasions with symptoms of a headache, which were managed with painkillers (probably features of asymptomatic meningitis). Altered sensorium as confusion, disorientation, amnesia, nervousness, personality changes, hostile attitudes, aggressive behaviors, hallucinations, and illusions prior to ischemic events were also developed by our patient.

A reactive serologic test for syphilis with reactive VDRL in cerebrospinal fluid (CSF) is the definitive diagnosis of neurosyphilis.¹³ Serum rapid plasma

reagin (RPR) was positive in our patient which was further confirmed by Treponema pallidum hemagglutination assay (TPHA). Recommended regimen for primary lesion in adults is a single dose of 2.4 million units of IM injection of benzathine penicillin G.¹⁴ Injection benzathine penicillin G, even at high dose, does not produce adequate CSF concentration for bactericidal effects.¹⁵ Prospective multicentric randomized controlled clinical trial has been ongoing in China which is comparing injection aqueous crystalline penicillin G(ACPG) vs injection ceftriaxone for the treatment of neurosyphilis.¹⁶ So, we cannot say whether ceftriaxone is superior to ACPG. However, patients treated with ceftriaxone have lesser hospital stay burden.¹⁶ Good blood brain barrier penetration property of ceftriaxone makes it the best alternative to ACPG.¹⁶ In our case due to unavailability of inj. ACPG in our institution, injection ceftriaxone was used for the treatment of neurosyphilis. With the commencement of the ceftriaxone therapy, the patient initially showed good response but later her condition deteriorated and she died. It's important to note that meningovascular syphilis is a rare disease, and proper diagnosis and treatment are essential to prevent serious complications.

Conclusion

In the era of antibiotics, very few studies highlighting MVS have been reported. Moreover, MVS may be misdiagnosed as other ischemic or hemorrhagic causes of stroke. So, when a young adult population with a prior history of painless lesion over genitals come with CNS manifestations following prodromal symptoms, possible diagnosis like meningovascular syphilis should not be missed out and antibiotic treatment should be started promptly to prevent serious complications.

Consent

Written informed consent was obtained ensuring patient's anonymity.

Declaration of competing interest

There are no conflicts of interest.

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Comparison of Findings of Pneumothorax in COVID-19 and Non-COVID-19 Patients: A Cross-Sectional Study

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Abstract

Background

Pneumothorax has been frequently described as a complication of COVID-19 infections. COVID-19-related pneumothorax likely signifies greater disease severity. Our study aims to compare pneumothorax in COVID-19 and non-COVID-19 cases in a university hospital.

Materials and Methods

A cross-sectional study was conducted on 130 patients who developed pneumothorax, along with details of follow-up cases from August 1st 2019, to March 31st 2021. In indicated cases, the primary intervention was done with chest tubes or pigtail catheters.

Results

Among 130 patients with pneumothorax, 104 patients were non-COVID-19 patients while 26 patients had concurrent COVID-19 infection. Of the total cases, 106 cases were male patients while 24 were female. The mean age of the patients was 51.5 years (SD 16.9 years, ranging from 16-81 years). All the patients had complaints of chest pain, while 122 of them had shortness of breath. Right-sided lung involvement was present in 74 patients (56.9%), left side involvement was 52 (40%), and bilateral involvement was 4 (3.1%). Regarding intervention, the chest tube was inserted in 110 (84.6%) patients, while a pigtail catheter was inserted in 20 (15.4%) patients. The mean duration of a chest tube or pigtail catheter insertion was 4.1 days (SD 1.6 days, Range of 2-12 days). The mean length of hospital stay was 5.2 days (SD 1.9 days, Range 3-14 days). The number of patients who were smokers was 72 (55.4%).

Conclusion

COVID-19 cases were associated with a greater severity and graver prognosis of pneumothorax than non-COVID-19 cases, including a longer hospital stay, higher incidence of persistent airway leakage, and need for catheter reinsertion.

Keywords: Catheter, Chest tubes, COVID-19, Pneumothorax.

Introduction

COVID-19 infection can result in a varying range of symptoms starting from mild common cold to pneumonia to severe complications such as pneumothorax, subcutaneous emphysema and pneumomediastinum[1]. The exact aetiology still remains unclear; however, these have been linked to the use of positive pressure respiratory support or those breathing spontaneously[1, 2]. Further, mechanical ventilation appears to be a predominant risk factor for developing pneumothorax with COVID-19 pneumonia due to increased intrathoracic pressure[3]. In COVID-19 pneumonia, pneumothorax often results from the inflammation of the lung parenchyma with severe lung injury and diffuse alveolar damage [3].

Here, we present a cross-sectional study performed on patients with pneumothorax to find its correlation with severe COVID-19 infection. Our study aims to describe the clinical characteristics of patients with these pathologies and consider whether the development of pneumothorax can be used as a marker of poor prognosis in the case of COVID-19.

Methods

A cross-sectional study was conducted in the Cardiothoracic and Vascular Surgery unit in Dhulikhel Hospital, Nepal, in patients who developed pneumothorax from August 1st, 2019, to March 31st, 2021. The outcome of pneumothorax in COVID-19 patients was compared with characteristics and outcomes of pneumothorax in patients without COVID-19. In indicated cases, the primary intervention was done with chest tubes or pigtail catheters (Figure 1). Regarding secondary pneumothorax, the British Thoracic Society guidelines indicate the insertion of chest tube drain in pneumothorax measuring >2cm or in the presence of breathlessness[9]. As recent studies have suggested, chest tube and pigtail catheters are equally effective for managing pneumothorax, and one of the two treatment modalities was selected.[10] Chest tubes made of PVC of size 20-28 French were used, and pigtail catheters of 14-16 French were used. All procedures were done at the bedside under local anaesthesia and without radiologic guidance. During the insertion of pigtail catheters, we typically employ a small (22 gauge) “finder needle” before inserting the larger needle provided with the kit. Air or pleural fluid should be easily withdrawn with the needle, and passage of the guidewire into the pleural space should be virtually effortless. The pigtail catheter is attached to a standard thoracic drainage system, and suction is applied for pneumothoraces[6]. Proper aseptic technique as per institute policy was followed.

Regarding outcome variables, the mean duration of the

intercostal drain (chest tube or pigtail) and duration of hospital stay were compared. Persistent pneumothorax was defined as an air leak lasting longer than 72 h from the conclusion of the surgical procedure[7]. Cases where air leak did not stop in five days, were further managed by chemical pleurodesis using 50ml 10% betadine. COVID-19 cases are defined as per the guideline set by the World Health Organization[8].

Outcomes were compared based on the duration of chest tube/pigtail insertion, length of hospital stay and presence or absence of persistent pneumothorax, need for chemical pleurodesis, surgical emphysema, reinsertion of chest tube/ pigtail catheter and the need for ICU admission.

All the data of the procedure and patient information were taken from the hospital software after proper consent from the patients and concerned authority from the hospital, and clinical manifestations and complications were analyzed retrospectively. Monthly follow-up of the cases was done to note the patency. The study was conducted according to the guidelines of Strengthening the reporting of cohort studies in surgery (STROCSS) 2019.



Figure 1. Chest X-ray showing insertion of the chest tube.

Results

There were a total of 130 patients that including 104 cases of pneumothorax in non-COVID patients and 26 cases in COVID patients. Of the cases, 106 were male patients (81.5%) while 24 were female (18.5%). The mean age of the patients was 51.5 years (SD 16.9 years, range 16-81 years).

In terms of symptoms, 122 patients had shortness of breath, and all the patients complained of chest pain.

The number of patients who were smokers was 72 (55.4%). In terms of side, right side involvement was 74 (56.9%), left side involvement was 52 (40%), and bilateral involvement was 4 (3.1%). Regarding the type of intervention for pneumothorax, a chest tube was inserted in 110 (84.6%) patients, while a pigtail catheter was inserted in 20 (15.4%) patients. The mean duration of a chest tube or pigtail catheter insertion was 4.1 days (SD 1.6 days, range 2-12 days). The mean length of hospital stay was 5.2 days (SD 1.9 days, Range 3-14 days).

Table 1: Duration of chest tube/ pigtail catheter insertion and length of hospital stay in COVID negative and positive patients.

Variables	COVID negative cases (mean)	COVID positive cases (mean)	p value
Duration of chest tube/ pigtail	3.8	5.3	<0.01
Length of hospital stay	4.7	7.2	<0.01

Table 2: Outcome of chest tube/pigtail catheter insertion in COVID negative and positive patients.

Variables	Sub groups	COVID negative cases	COVID positive cases	p value
Persistent pneumothorax	Yes	8	20	<0.01
	No	96	6	
Need for chemical pleurodesis	Yes	4	14	<0.01
	No	100	12	
Reinsertion of chest tube/ pigtail catheter	Yes	0	4	<0.01
	No	0	22	
Need for ICU	Yes	0	8	<0.01
	No	104	18	
Outcome of cases	Good	104	24	<0.01
	Expired	0	2	

Discussion

The term pneumothorax refers to an abnormal collection of air in the pleural cavity, space between parietal and visceral pleura[3]. It is often caused due to chest trauma and iatrogenic procedures (traumatic pneumothorax), underlying diseases of the lung (secondary spontaneous pneumothorax) or in the absence of any event or underlying lung disease (primary spontaneous pneumothorax)[3][4]. COVID-19 infection also results in severe complications such as

pneumothorax, and pneumomediastinum, apart from causing pneumonia with parapneumonic effusion[1]. These complications due to COVID-19 in critically ill patients are linked to positive pressure ventilation systems and invasive and non-invasive mechanical ventilation as the management of patients with the severe disease requires such respiratory support[1]. Therefore the incidence rate of pneumothorax in critically ill patients with invasive mechanical ventilation (IVM) is up to 15% [3, 5].

COVID-19 infection causes diffuse inflammation of the lung parenchyma resulting in severe lung injury and diffuse alveolar damage, which could be one of the mechanisms for developing spontaneous pneumothorax[6]. Furthermore, oedema and collapse of the edematous portion of the lung in the dependent regions lead to reduced lung volumes and cause tachypnea and hypoxemia[5]. This further results in surfactant dysfunction, loss of lung tissue, fibrosis, cyst formation and finally, alveolar rupture contributing to the development of pneumothorax in COVID-19 patients[6][4]. On the contrary, rupture of the pneumatocele and infarction caused by underlying pulmonary thromboembolism could be other less common possible mechanisms of pneumothorax in COVID-19 infections[6]. In COVID-19 patients under mechanical ventilation, pneumothorax is probably due to overdistention of the alveoli, causing an alveolar rupture and barotrauma[7][4].

Clinically, acute deterioration in covid-19 patients with hypoxia indicates pneumothorax, often presenting with shortness of breath [6]. In our study, most patients presented with chest pain and shortness of breath and were diagnosed with pneumothorax. But, in radiographic imaging, pneumothorax is one of the uncommon findings in patients with COVID-19 infections[6]. The common imaging finding in patients with COVID-19 infections is ground-glass opacities involving the lower lobes[6].

In a study by Ekanem et al., spontaneous pneumothorax is considered one of the potential complications of COVID-19, with a mortality rate of 36% and an increased rate of severity[8].

Martinelli et al. reported a high incidence of 84.5% of pneumothoraces in their study of 71 hospitalized COVID-19 patients[5]. The study showed the need for chest tube drainage in eleven patients and right upper lobe bullectomy performed in one patient[5]. Further, in their study, more than half of the patients improved and were discharged. However, our study showed a low incidence of pneumothorax in COVID-19 cases compared with non-COVID-19 cases with an increased need for ICU admission and an increased mortality rate in COVID-19-related pneumothorax which is contrary

to their study.

In a study by Wang et al., 23.8% (5/21) developed pneumothorax in critically ill COVID-19 patients indicating greater disease severity with mortality rates of 80%[9]. Besides, our study also showed a high mortality rate representing pneumothorax as a marker of poor prognosis among the covid positive patients.

Miro et al., in their study, have mentioned that COVID-19 patients with pneumothorax had a 12.9, 4.2, and 15.7-folds increased risk of ICU admission, prolonged hospitalization, and higher in-hospital mortality than those without pneumothoraces[10]. Our study also showed the increased length of hospital stay, increased incidence of persistent pneumothorax with the need for pleurodesis, need for ICU admission and increased mortality rate in COVID-19-related pneumothorax. A higher incidence of persistent pneumothorax (20 versus 8; $p < 0.01$) was noted in COVID-19-related pneumothorax with the need for chemical pleurodesis in such patients. Additionally, our study demonstrated the need for ICU stays in COVID-19-related pneumothorax, adding to the severe course of its disease.

Aiolfi et al. reported two patients with COVID-19 treated with thoracoscopy and bleb resection for persistent pneumothorax, whereas chemical pleurodesis was performed in one patient[11]. Though the initial definitive management of patients with pneumothorax is chest tube drainage, thoracoscopic surgery might be indicated in patients with persistent pneumothorax for better outcomes and more effective air leak control[11]. In our study of 20 patients with persistent pneumothorax, chemical pleurodesis was done in 14 cases.

Conclusion

The above study reveals that COVID-19-associated pneumothorax is more severe than non-COVID-19

cases. There is a greater duration of a hospital stay along with a higher incidence of persistent airway leakage and the need for catheter reinsertion.

Limitation of the study

Consequently, we cannot accurately use our study to determine the incidence of this association within Nepal.

Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Sources of funding

No funding was secured for this study.

Consent for publication

Informed consent was obtained from each participant.

Availability of data and materials

All relevant data and materials are provided within the manuscript.

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None

Provenance and peer review

Not commissioned; externally peer-reviewed.

Declaration of competing interest

None

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Submission checklist

General Format

- File type (save in .doc format)
- Font/ Font size (Times New Roman/ 12)
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- Please introduce the non-standard abbreviations at the first occurrence.
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Specific format

Case Report

- Word limit (1500 words excluding the abstract and references)
- References (A maximum of 15 references)
- Patient consent form ([Click here](#))
- Structuring:

- Abstract (within 150 words)
- Keywords (3-6; must be present in MeSH)
- Introduction (not more than 150 words)
- Case Report
- Discussion
- References (Vancouver)
- Figure legends

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 - Methods
 - Results
 - Conclusion
 - Introduction (not more than 150 words)
 - Methods
 - Results
 - Discussion

Submission checklist

- Limitation
- Conclusion
- Ethical Approval
- Declaration of competing interest
- Acknowledgement
- References (Vancouver)
- Figure/ Table

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