AIMS, SCOPE & POLICIES

Open Access Policy
Journal of Surgery Pakistan is a peer reviewed open access biomedical journal published quarterly since 1996. It is recognized by Higher Education Commission (HEC) of Pakistan under "Y" Category of national journals. It is also indexed in Index Medicus of EMRO of World Health Organization. It was also recognized by Pakistan Medical & Dental Council (defunct since recent Pakistan Medical Council Act). It provides platform for dissemination of research related to Surgical and Allied Specialties with emphasis on clinical studies and basic research on human subjects. However, it does not process animal studies. It has a print version and Open Access Electronic version so as to facilitate quick access to latest issue to larger audience as well as for archiving in bound volumes for libraries, both within country and abroad.

All submitted articles undergo initial in-house editorial triage so as to assess the suitability of the manuscript according to the scope of the journal and then send for double blind peer-review to two expert external reviewers. This ensures that authentic and quality research is published that helps in advancing and improving clinical practices and to build public trust. It follows guidelines of International Committee of Medical Journal Editors (ICMJE) and committee of publication ethics (COPE).

All material submitted for publication must comply with ethical standards related to biomedical journals. Multiple, duplicate and, redundant submission fall under publication misconduct. Similarly, falsification and fabrication of data are also considered as fraud. Selective reporting and misleading reporting as well as intentional omission of references are considered unethical. Tempering of images also fall into this category. Salami slicing of data is not allowed unless clear reason is provided as to why more than one articles are needed to report the findings from single data.

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Authorship criteria as specified by ICMJE must be followed. This include four essential conditions: 1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND 2. Drafting the work or revising it critically for important intellectual content; AND 3. Final approval of the version to be published; AND 4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. No change (the order and number) will be accepted in authorship once article is submitted to the journal. Gift, Guest and Ghost authorship is discouraged. Read carefully about contributorship criteria as well from ICMJE website. Briefly Contributors who do not meet all the above mentioned four criteria for authorship, but helped in the study, may be listed in the acknowledgement section.

Contributions of Authors to the Manuscript: Detailed contribution made by each author will be required at the time of submission of the manuscript.

Corresponding Author will be the person with whom all the correspondence will be made. He will act on behalf of other authors and will be responsible for all the required changes to be made in the manuscript in the light of reviewers and editors observations.

Disclosure must be made if funding is acquired for the study. Any other conflict of interest / competing interest in professional / personal capacity must be disclosed. In case the study is carved out of dissertation / thesis, must be mentioned in covering letter.

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The corresponding author is responsible for ensuring article publication has been approved by all co-authors. After the publication of the paper author dispute related issues will not be entertained. Any change in the authorship (such as addition or deletion of author(s) or change in the sequence of author list after submission of an article will not be entertained. Copyright status is followed according to the Creative Common License 4.0.

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A retraction note will be published by the journal in the paginated part of a subsequent issue and will be listed in the contents list. In the electronic version, a link will be made to the original article. The water mark will also appear with the said article and same will be put into PDF format of the article. The HTML version of the document will be removed.

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The Journal welcomes the submission of manuscripts that fulfill the general criteria of significance and reports material with excellence. Papers shall be sent for double blind peer review. The whole process from initial submission to publication, if accepted, takes around 12-weeks.

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Letter to the Editor:
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General Format
All sections of the manuscript must be typed double-spaced and all pages numbered starting from the title page.

Original Article:
The length of the paper should not exceed 2000 words (excluding abstract and references section).

The Title should be a brief phrase describing the contents of the paper.
The Title Page should include the authors' full names and affiliations, the name of the corresponding author along with phone, fax and e mail address. Present addresses of the authors should appear as a footnote. The word count should also be mentioned and a brief running title provided.

Complete sentences, active verbs, and the third person language should be used. It should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. Each abbreviation should be spelled out and introduced in parentheses the first time it is used in the text. Only recommended SI units should be used.

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Introduction should provide a clear statement of the problem, the relevant literature on the subject, gaps in the knowledge and rationale of the study. Usually three to four paragraphs are expected. No more than 10 references are suggested. References must be in numerical order, and preferably less than five years old. References must be in numerical order and written as superscript.

Methodology should be in sufficient detail to allow the experiments to be reproduced by other scientists. Only new procedures should be described in detail. Previously published procedures should be cited, and important modifications of published procedures should be mentioned briefly. Capitalize trade names and include the manufacturer's name and address.

Methods in general use need not be described in detail.

Study design, place and duration of study, inclusion / exclusion criteria, sample size calculation and variables analyzed must be mentioned. Methods for statistical analysis of the data must be described in detail. All statistical tests applied must be mentioned. Significant level and confidence interval, where applicable, be defined. Actual values must be mentioned. All numbers must be accompanied with percentages.

Results should be presented with clarity and precision. The results should be written in the past tense. Results should be explained but not discussed and without referring to the literature. Statistical values calculated must be written. The sentence mentioning p value as less than 0.05 is not acceptable. The data described in text must not be put in table and vice versa. Use tables where seems appropriate and same must not be repeated in charts. All charts must be in shades of black and grey with clear distinction between groups.

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Limitations of the study must be described and future directions mentioned in the form of recommendations without separate heading.

Conclusion must relate to the outcome of the study and no recommendations must be put in this section.

Disclosure Source of grants, and funding must be mentioned. If study is based upon a thesis or dissertation, then its details must be provided. Authors must provide details If part of the data related to the study is presented previously in any scientific conference or other educational platform.

Competing Interest: Any potential or actual competing interest must be declared.

Ethical Statement: All studies must be conducted after getting Institution Review Board permission. Submit scanned copy of approval letter and its number with date. Informed consent statement is also required.

Tables should be kept to a minimum and be designed to be as simple as possible. Tables are to be typed double-spaced throughout, including headings and footnotes. Each table should be on a separate page, numbered consecutively in Roman numerals and supplied with a heading and a legend. Tables should be self-explanatory without reference to the text. The same data should not be presented in both table and graph form or repeated in the text. Tables should be prepared in Microsoft Word.

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References: In the text, a reference identified by means of a number in superscript style that shall remain constant throughout the manuscript. References should be listed at the end of the paper in numerical order.Ê Articles in preparation or articles submitted for publication, unpublished observations, personal communications, etc. should not be included in the reference list. For articles with more than 6 authors add et al after sixth name. Journal names are abbreviated according to Vancouver style. The number of references must be between 15 – 25. Most of these must be from last five years. It is preferable to add DOI of reference if available.

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A well reported research conveys the message clearly without any ambiguity. The standard pattern of reporting helps in understanding how research is conducted and if someone plans to replicate the same, it is done without any difficulty. Methodology part is the most important part of the manuscript. A checklist helps in preparing and writing the manuscript.

“The EQUATOR (Enhancing the Quality and Transparency Of health Research) Network is an international initiative that aims to improve the quality of research publications. It provides a comprehensive list of reporting guidelines and other material to help improve reporting”These guidelines are available on the network.
Following are few reporting guidelines for common study designs:

- Randomized controlled trials –CONSORT
- Systematic reviews –PRISMA
- Observational studies –STROBE
- Diagnostic/prognostic studies – STARD / TRIPOD
- Case reports –CARE
- Qualitative research –COREQ

Useful links for Authors

- ICMJE Recommendations (2013 version) http://www.icmje.org/icmje-recommendations.pdf
- Declaration of Helsinki (2013 version) http://www.wma.net/en/20activities/10ethics/10helsinki/DoH-Oct2013-JAMA.pdf
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- COPE Code of Conduct for Journal Editors (publicationethics.org/resources/flowcharts) http://publicationethics.org/resources/code-conduct
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ABBREVIATED INSTRUCTIONS

GENERAL INSTRUCTIONS

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Original Articles
These articles present new, valid and relevant investigations into the etiology, pathology, diagnosis and treatment of surgical diseases.

Case Report / Evidence Based Report / Short Communication
These must be of educational value and stress unusual features of disease.

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PREPARATION OF MANUSCRIPT

The manuscripts should be typed in double space. There should be no more than 25 references in an Original Article, and no more than 40 in a Review Article. The title of the paper should be followed by the full name, degree(s) designation, hospital and medical college affiliation, hospital address and the name and address (email) of the person to be approached for correspondence.

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Below the abstract please include 3-5 key words or phrases that will assist indexers in cross-indexing the article. Use terms from the medical subjects list from the Index Medicus, whenever possible.

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The author's comments on the results, supported with contemporary references, including arguments and analysis of identical works done by other workers to be discussed.

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CHECK LIST

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Introduction	Should be strictly related to objective. of the study. About three paragraphs with no more than 10 references is suggested.	It should be precise and highlight the importance of study.	The last paragraph should describe rationale of conducting the study.	
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Results	Results should be related to the objective of the study.	The results plotted in table or charts should not be repeated in text and vice versa. Only 3 tables are allowed. Maximum of 3 pictures in JPEG of high resolution format is allowed for case report.	No opinion should be given about the results in this section.	
Discussion	Should relate to the objective of the study.	It should be in paragraphs supported by relevant recent references.	Each issue should be discussed in a separate paragraph.	References supporting statements should not be quoted like 1-10.
References	Total number of references for original article should be between 15 - 25. For case report maximum of 10 references are allowed.	References should be written in Vancouver style. References should be in numerical order.	Majority of the references should be from recent literature, less than 5 years old.	Pakistani references to be cited if available.
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EDITORIAL

ORIGINAL ARTICLES

CASE REPORT

Current Recommendations of Use of Blood, Its Products and Control of Hemorrhage in Trauma Victims

Naima Zamir [1*]

Trauma is a major cause of massive hemorrhage, which accounts for six out of ten trauma-related early deaths. Maintenance of circulation in a massive bleeding as a result of injury is a big challenge. This includes not only the control of on-going blood loss but the coagulopathy, that may result from transfusion, and hypothermia. On-going research on the subject has improved our understanding about the pathophysiology that has resulted in development of new guidelines and treatment protocols for crystalloid and massive blood transfusion, a restricted and goal directed resuscitative approach.[1]

Massive or continuous bleeding causes the volume depletion. This disturbs the physiological coagulation mechanism. Initial hypo-coagulability results in fibrinolysis leading to the uncontrolled bleeding and a shock state. This is followed by a hyper-coagulation state with excessive clot formation that leads to thromboembolism and multi-organ failure.[1] Factors like the pre-existing co-morbid conditions, duration of bleeding, hypothermia, hypo-perfusion, acidosis, hemodilution as a result of crystalloid infusion, the resultant inflammatory cascade all play their role in worsening the condition. The coagulopathy, hypothermia, acidosis and hypocalcemia make the 'lethal diamond of bleeding.[2] This highlights the importance of frequent clinical and laboratory evaluations in the management of these patients.

Viscoelastic testing (TEG or ROTEM) is recommended early in the evaluation of clotting kinetic assay. However, it is not available in trauma settings. The standard coagulation assays are usually requested though not very reliable in trauma setting. This includes estimation of hemoglobin, platelet, fibrinogen, PT, APTT, and INR.[3] For an accurate diagnosis, a whole point of care testing is required, which includes platelet function, arterial blood gases, and serum calcium levels.

In the trauma patient with moderate to severe bleeding, the coagulopathy starts early. To avoid the "lethal diamond" the body temperature of the patient should be kept near to the normal, pH of more than 7.2 or preferably normal to avoid acidosis and ionized calcium level of = 9mmol/L.[4] Tranexamic acid (TXA) is an antifibrinolytic medication. In order to be effective in controlling bleeding it is administered within three 3 hours of trauma.[5] It is recommended to transfuse as a balanced resuscitation with red blood cells, plasma, and platelets in ratios of 1:1:1 to 2:1:1 until bleeding is no longer life-threatening.[6] However, this ratio-driven approach may result in unnecessary transfusion of blood components which are not required and may be harmful.

If compatible blood is not available in an emergency, generally type specific uncross-matched (preferably) or "O" PRBCs and type AB plasma are indicated. Large volumes and inappropriate transfusion of blood or blood product may increase the morbidity and mortality. This may cause acute lung injury, circulatory overload, or immune modulation.[7]

Not all the clotting factors are equally depleted in hemorrhage and the non-targeted therapy is not effective. A "goal-directed approach", consisting of hemostatic resuscitation with blood components guided by viscoelastic haemostatic assays or the standard laboratory tests is advocated.[4]

- RBCs are only to be a substituted for hemoglobin below the 7-8 mg/ dl.

- The plasma should only be transfused when the INR is above 1.5 or 1.6.

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- Platelets transfusion is only indicated if the count drops below $50x10^9$L or is defective in function or when bleeding is continued and excessive.

- Fibrinogen is the first factor to deplete in the setting of massive bleeding and a level <1.5–2 g/L is an indication of substitution. The use of plasma and cryoprecipitate transfusion is no longer recommended for the replacement of fibrinogen. The current recommendation of European guideline is the transfusion of fibrinogen concentrate, 25–50 mg/kg BW.[1]

- Prothrombin complex concentrate (PCC) containing factors II, VII, IX, and X (4-factor PCC) or II, IX, and X (3-factor PCC) is effective if used with plasma. An initial bolus of 25 IU/kg BW appears to be effective and for those patients with an increased risk for thromboembolism an initial half-dose bolus of 12.5 IU/kg BW followed by a second dose if microvascular bleeding persists.

- Recombinant activated factor VII is indicated when traditional options for treating excessive bleeding due to coagulopathy have been exhausted.

- In USA there is growing evidence in support of the use of low titer type “O” whole blood (LTOWB) as universal donor compared to component therapy in massive transfusion. It has been found to have many advantages with few limitations.[8]

“Stop The Bleed” initiative by the American College of Surgeon's Committee on Trauma and the Hartford Consensus aims the community-based educational training for lay people to control external bleeding by proper compression techniques well before reaching the health facility.[9] Control of bleeding needs the correct identification of the bleeding patient. Compressive (external bleeding) bleeding control varies from simple pressure at the wound site, hemostatic techniques with the use of tourniquet, pelvic binders or hemostatic dressing. However, non-compressive (torso) hemorrhage may need surgical or radiological (angio-embolization) intervention. The resuscitative endovascular occlusion of the aorta (REBOA) is a technology recently used to control haemorrhage. Expandable polyurethane foam injection into the peritoneal cavity can create a temporary tamponade effect to stop or slow bleeding.

Control of hemorrhage and transfusion of blood and blood products are the subject of ongoing research. Hemorrhage is a major challenge for the trauma surgeons and is still a major cause of morbidity and mortality. An evidence based approach helps in addressing this challenge. Surgeons must keep them updated about the current recommendations of transfusion practices. They should also contribute to the scientific literature about the utility of the current practices and potential challenges so that any change, if required, may be incorporated into future practices.

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Is Fistulotomy a Better Option Than Fistulectomy For Low Anal Fistulae?

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ABSTRACT

Objective — *To compare the postoperative results of fistulectomy and fistulotomy for low fistula in ano.*

Study design — *Comparative study.*

Place & Duration of study — *Surgical 'B' unit, Hayatabad Medical Complex Peshawar, from March 2020 to February 2021.*

Methodology — *In this comparative study, a total of 48 patients were included. They were divided into groups A and B, each comprising of 24 patients. After thorough investigations, group A was subjected to fistulectomy and group B to fistulotomy. Patients were followed in OPD for 12 weeks. Postoperative outcomes were recorded and analyzed through SPSS version 16. The Chi-Square test was used for the comparison of categorical data. A $p < 0.05$ was taken as statistically significant.*

Results — *Age of the subjects was from 23 years to 65 years with a mean age of 37.5±6.5 years. Male to female ratio was 7:1. Preoperatively, 81.25% patients had subcutaneous, 12.5% intersphincteric and 6.25% transphincteric low anal fistulae. Postoperative morbidity included pain (group A - 75% and group B - 41.7%), discharge from wound (group A - 50% and group B - 37.5%), and recurrence rate of fistula 8.3% in group A and 4.2% in group B. Operative time was 30 to 40 minutes in group A and 15 to 25 minutes in group B (p=0.04), wound healing time 6 to 8 weeks in group A and 4 to 6 weeks in group B (p=0.04). However, the hospital stay was 1 to 2 days in both the groups which was insignificant (p=1.00).*

Conclusion — *Fistulotomy procedure was found better in terms of postoperative outcome compared to fistulectomy.*

Key words — *Fistulotomy, Fistulectomy, Low fistula in ano.*

INTRODUCTION:

Anal fistula is a chronic abnormal communication lined by granulation tissue, between the rectum, anal canal and perianal skin. The incidence of abscess formation and anal fistula is 1-2/10,000. Males are commonly affected than females with male to female ratio of 2:1.[1] Adults between 20-45 years, are most commonly affected by this disease. Anal fistulae are classified into high or low, simple or complex and intersphincteric, transphincteric, supra sphincteric and extra sphincteric according to their relation with anal sphincter.[2,3] Majority of the anal fistulae develop secondary to the perianal abscess which is either inadequately drained or rupture spontaneously.[4] Other causes include inflammatory bowel disease, malignancy, and specific infections like tuberculosis.[5,6] Anal fistula may also develop following internal sphincterotomy for anal fissure.[7]

Low anal fistulae are more commonly encountered than high variety. The goal of the surgical treatment of an anal fistula is to permanently eradicate the fistula without compromising the anal continence.

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Prior knowledge regarding the etiology and anatomy of anal sphincter is of utmost importance in the management of anal fistulae.[8] Low fistula in ano is treated either through fistulectomy or fistulotomy. Fistulectomy is associated with complications like partial or complete fecal incontinence as compared to fistulotomy. Therefore, fistulotomy is preferred over fistulectomy due to it low complications rate.[9-11] Number of surgical procedures are performed for high type of fistula in ano.[12,13] Seton procedure provides excellent functional results without cutting the anal sphincter.[14] There is still ongoing debate about choice of surgical procedure for low fistula in ano in relation to frequency of postoperative pain, healing time, fecal incontinence, and recurrence.[15-17] The objective of this study was to compare the postoperative outcome of the procedures fistulectomy and fistulotomy for low fistula in ano.

METHODOLOGY:

This was a comparative study conducted at Surgical "B'' unit, Hayatabad Medical Complex Peshawar, from March 2020 to February 2021 after approval of ethical review board of the institution. Patients were divided randomly through lottery method, into Group A comprising of 24 patients, who were subjected to fistulectomy while group B comprising of the same number of patients, underwent fistulotomy. The sample size of 48 was calculated by using WHO calculator keeping proportion of 3.12%[16] postoperative infection following fistulectomy, with 95% confidence interval and 5 % margin of error. These 48 patients with the diagnosis of low fistula in ano, were admitted from outpatient department.

Low fistula in ano included subcutaneous, low intersphincteric and low trans sphincteric type of fistulae. Patients having high, complex and recurrent fistulae or fistula associated with fecal incontinence, were excluded. Patients suffering from inflammatory bowel diseases, tuberculosis or associated comorbid diseases like diabetes mellitus, ischemic heart disease, malignancy, or taking steroid therapy, were also excluded. A detailed history and clinical examination including digital rectal examination (DRE), were performed to assess the tone of anal sphincter. A fistulogram was performed usually before admission to confirm the diagnosis and assess the site of internal opening. Baseline investigations including full blood count, urea, sugar, HBsAg, HCV, X-ray chest and ECG were performed.

A written informed consent was taken from the patients after explaining the procedures. Procedures were formed in lithotomy position under general anesthesia or spinal anesthesia. Preoperative proctoscopy was performed to assess the internal opening and any other associated pathology. In cases, where internal opening was not identified, hydrogen peroxide was injected through external opening to locate the internal opening. After the standard procedure hemostasis was secured. Patients were allowed orally after complete recovery from anesthesia. Patients were discharge on the following day with the advice of personal hygiene and sitz baths. Oral antibiotics, analgesics and stool softeners were also prescribed. Patients were followed on weekly basis in the outpatient department for 12 weeks. All patients completed their follow up visits. Postoperative outcome were noted on a predesigned form. Data were analyzed through SPSS Version 16. Descriptive statistics were used to present frequency of qualitative variables. Chi-square test was used for the comparison of categorical data. A p-value of less than 0.05 was considered as statistically significant with the confidence interval of 95%.

RESULTS:

A total of 48 patients were enrolled. There were 42 (87.5%) male and 6 (12.5%.) female patients with ratio of 7:1. The age of the patients was from 23 years to 65 with the mean age of 37.5± 6.5 years. The presenting complaints were serous or serosanguinous discharge in 45 (93.7%) patients, pruritus in 20 (41.7%) and pain in 13 (27.1%) subjects. Twenty-five (52.08%) patients had history of surgical drainage of perianal abscess and in 9 (18.7%) perianal abscess burst spontaneously. In 39 (81.35 %) patients there was subcutaneous anal fistula, 6 (12.5%) had intersphincteric while 3 (6.25%) had trans-sphincteric low anal fistulae.

Postoperative morbidity included postoperative pain (group A - 75% and group B - 41.7%), wound discharge (group A -50% and group B - 37.5%). Details are given in table I. Operative details and hospital stay are mentioned in table II.

DISCUSSION:

Fistula in ano is a benign condition however, it has significant bearing on the quality of life of an individual. About 90% of fistulae are of low variety. Significant advancement has been made in the surgical management of fistula in ano but still there are significant postoperative issues including morbidity and recurrence. The commonly used surgical procedures include fistulectomy and fistulotomy. Both have merits and some demerits as number of complications are associated with both

Table I: Postoperative Morbidity (n=48)

Complications	Fistulectomy (Group A) n=24	Fistulotomy (Group B) n=24	P- value
Postoperative Pain	18 (75%)	10 (41.7%)	0.03*
Postoperative Discharge	12 (50%)	8 (37.5%)	0.4
Postoperative Bleeding	2 (8.3%)	1 (4.2%)	0.9
Wound Infection	2 (8.3%)	2 (8.2%)	0.8
Partial Incontinence	4 (15.7%)	2 (8.43%)	
Complete Incontinence	0	0	
Recurrence	2 (8.3%)	1 (4.2%)	0.9

Significant*

Table II: Comparison of the Procedures

Variables	Fistulectomy (Group A) n=24	Fistulotomy (Group B) n=24	P- value
Operative Time (minutes)	30-40 (Mean - 35)	15-25 (Mean 25)	0.04*
Wound Healing (Weeks)	6-8 (Mean 7)	4-6 (Mean 4.5)	0.04*
Hospital Stay (Days)	1-2 (Mean 1.5)	1-2 (Mean 1.5)	1.00

Significant*

the procedures.[18] In this study the mean age of the patients was 37.5± 6.5 year with male predominance. This is in conformity with reported literature where wide variation is found.[18-20]

Patients with anal fistula present with a variety of symptoms. In this series, the common presenting complaints were serous or serosanguinous discharge in 93.7% subjects. Ahmed et al reported swelling (86.6%), discharge (37%) and itching (27%) as predominating symptoms in their study.[15] Kamal ZB found discharge from external opening in 39.47% cases.[16]

In this study, postoperative pain was the most common complaint in 75% patients in group A and 41.7% in group B which was significant. Ahmed et al also noted significant difference between the two groups at the end of first postoperative week. However, after four weeks, there was significant relief of pain in group B patients.[15] Similarly, Esebai et al also noted significant decrease in the intensity of pain in fistulotomy group.[17] Other researchers did not find significant difference between the two groups in terms of postoperative pain.[19,20]

Postoperative wound discharge is a complication which is quite annoying for the patients. In this series, no significant difference was noted between the two groups as reported in another study.[15] Postoperative bleeding was also not significant which is similar to other studies.[4] In the current study, wound infection most commonly occurred due to poor hygiene which resulted in delayed wound healing. However, the frequency of wound infection was insignificant. This complication was managed with oral antibiotic and local antiseptic dressings. Kamal et al reported 3.12% and 2.27% infection rate in fistulectomy and fistulotomy groups which was not significant.[16]

In this study 16.7% patients in group A and 8.3% in group B had partial incontinence to gases which recovered completely after complete wound healing and physiotherapy. There was no case of complete fecal incontinence in this series. Cheung et al reported no significant difference in incontinence between the two groups.[1] Fistula in ano is a notorious for its recurrence and especially in the high variety. Recurrence commonly occurs 4 - 6 weeks after surgery.[16] In our study, two patients had recurrence following fistulectomy and one after fistulotomy. Same observations were found in other studies.[1,2,16] The operative time for fistulectomy was more than that of fistulotomy and was statistically significant. It is because of the nature of the surgical procedure, as in fistulotomy track is simply laid open. Same has been the findings in other studies.[5,8,16] Hospital stay in both the procedures was almost same as admission is not required after surgery and patients can be discharged to be followed in outpatient department.

The number of patients in each group was small and follow up time was also short. It is also a single center based data, thus multicenter studies with large sample size and long follow up are suggested to add to evidence based practices and develop future guidelines.

CONCLUSION:

The surgical procedure fistulotomy for low type of anal fistula had better postoperative outcome in terms of pain relief, early discharge from hospital and wound healing in comparison with fistulectomy.

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Shock Index As a Predictor of Adverse Maternal Outcome In Postpartum Hemorrhage

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ABSTRACT

Objective *To determine the accuracy of shock index in predicting adverse maternal outcome in women with postpartum hemorrhage (PPH).*

Study design *Retrospective observational study*

Place & Duration of study *Department of Obstetrics & Gynecology Unit-II, Dr. Ruth K.M Pfau, Civil Hospital Karachi, from October 2018 to March 2021.*

Methodology *All women who were referred with the diagnosis of PPH were included. Blood loss > 500 ml after vaginal delivery, and > 1000ml after cesarean section was labeled as PPH. Shock index was calculated by dividing heart rate with systolic blood pressure. Adverse maternal outcome were classified according to the WHO criteria and included blood transfusion, intensive care admission, obstetric hysterectomy and maternal death.*

Results *A total of 197 women of primary PPH with a mean age 28.71± 5.33 year and mean body mass index 28.14±3.27 kg/m^2 were managed. Majority of the women were delivered by vaginal route (n=184 - 93%) with parity <3 (n=105 – 93%). For blood transfusion, ICU admission, obstetric hysterectomy and maternal death optimal cutoff values of SI were considered as 1.15, 1.28, 1.37 and 1.42, respectively. A SI of 1.42 had 90% specificity and 80% sensitivity for predicting maternal death.*

Conclusion *A raised SI of > 1 predicts adverse maternal outcome among patients presenting with PPH.*

Key words *Postpartum hemorrhage, Shock index, Obstetric hysterectomy, Adverse maternal outcome.*

INTRODUCTION:

Hemorrhage, hypertensive disorders and sepsis are the important causes of maternal death globally. Almost 90% of these deaths occur in low and middle income countries (LMIC). Shock index (SI), assessed by dividing heart rate with systolic blood pressure, is an indicator of hypovolemia and act as a predictor of hemodynamic stability. It has also been used in trauma, sepsis and hypertensive disorders of pregnancy to identify the critically ill patients. This simple calculation helps in identifying the cardiovascular stability and seriousness of patient's condition. Recently it has also been incorporated in devices, for appropriate referral and early transfer to the health care units with proper facilities.

A shock index of 0.4-0.7 is considered normal in non-pregnant women, whereas, a range of 0.7-0.9 is considered as normal in pregnant women. An increase in SI has been linked to severe adverse maternal outcome, including massive transfusion requirements, critical care admission and maternal

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mortality.[5] Nathan et al in a retrospective cohort of 233 women, with postpartum hemorrhage of >1500ml, found SI of > 0.9 of having 100% sensitivity and 43% specificity for critical care admission.[6] SI has also been evaluated in the low resource settings. El Ayadi et al identified a SI of >0.9 for the needs of referral, > 1.4 for tertiary care referral and > 1.7 for adverse maternal outcome. SI performed better than other vital sign parameters including heart rate, systolic blood pressure and mean arterial blood pressure.[7] The rationale of this study was to identify the performance of SI among women with postpartum hemorrhage in predicting adverse maternal outcome.

METHODOLOGY:

This study was carried out at the Department of Obstetrics & Gynecology Unit-II, Dr. Ruth K.M Pfau, Civil Hospital Karachi. This is the largest tertiary care hospital of the province OF Sindh. This was retrospective observational study that was conducted from October 2018 to April 2021. The study included all women who were referred in emergency with primary postpartum hemorrhage. Patients with secondary PPH, or those receiving anticoagulant therapy and with known hematological disorders were excluded from the study.

PPH was defined as blood loss > 500 ml after vaginal delivery and > 1000ml after cesarean section. Variables collected included the age, parity, mode of delivery, body mass index, place of delivery and referral. Etiological factors for postpartum hemorrhage, including trauma, uterine atony, coagulation disturbances, and retained products of conception were also recorded. Vital signs at the time of admission including heart rate, blood pressure, mean arterial blood pressure and shock index were calculated. Case files were also reviewed for medical or surgical management carried out and adverse maternal outcome including deaths. Adverse maternal outcome was defined according to World Health Organization (WHO) critical intervention criteria.[8] It includes intensive care admission, blood transfusion of > 4 units and emergency obstetric hysterectomy. All variables were entered into a pre designed form.

STATISTICAL ANALYSIS:

Mean and standard deviation were reported for continuous variable such as age, body mass index (BMI), estimated blood loss and vital signs. Frequency and percentages were reported for categorical variable such as parity and mode of delivery. Blood transfusion (low=<4 units, high=>4units), intensive care stay, obstetric hysterectomy and maternal death were considered as outcome variables to assess massive PPH. Assumption of normality was checked by using Shapiro-Wilk test. Areas under the curve (AUC) were evaluated for vital sign predictors and for each outcome of massive PPH using receiver-operating curve (ROC) analysis. Significance testing was performed to assess differences among AUC by unadjusted Chi-square test, keeping shock index as reference. Chi-square test and Mann-Whitney tests were run to check proportional and mean differences between the groups of shock index. Statistical significance was considered at p-value <0.05. Stata version 14.0 was used for statistical analysis.

RESULTS:

The file records of 197 pregnant women were reviewed. Demographic and delivery related characteristics are reported in table I. The age of the patients was between 17 and 45 years with the mean age of 28.71±5.33 year. The BMI was between 21.50 - 38.00 Kg/m^2. Ninety-two (46.7%) women had parity of more than three. Most of the women had vaginal delivery. (n=184 – 93.4%). Overall shock index of the women was between 0.40 and 2.72.

Areas under the curve (AUC) with 95% confidence interval (CI) based on ROC analysis are reported in table II to assess the usefulness of each vital sign parameter in prediction of massive PPH. For blood transfusion, values of AUC were high for SI, systolic blood pressure and mean arterial pressure (0.74 - 95% CI 0.63-0.84). This was significantly higher than the pulse pressure (p=0.003). For ICU admission, SI and systolic blood pressure had highest AUC values (0.78 - 95% CI 0.67-0.88) which was significantly higher than the heart rate (p=0.032) and pulse pressure (p=0.022). For obstetric hysterectomy, the value of AUC was high for SI (0.76 - 95% CI 0.64-0.89). For maternal death, shock index and heart rate showed highest AUC values (0.91 - 95% CI 0.83-0.98) which was significantly higher than the diastolic blood pressure (p=0.006) and pulse pressure (p=0.003).

SI remained consistent in predicting all outcomes of massive PPH. Optimal cutoff values of SI were assessed for each outcome of massive PPH and predictive values are reported in table III. For blood transfusion, ICU admission, obstetric hysterectomy and maternal death optimal cutoff values were considered as 1.15, 1.28, 1.37 and 1.42, respectively. Highest sensitivity (80.0%) and specificity (89.3%) were observed for maternal death. Negative predictive values for all the outcomes were high.

Table I. Characteristics of the Participants (n=197)

Characteristics	Values
Demographic and Delivery Details	
Age (year)	28.71 ± 5.33
BMI (Kg/m)^2	28.14 ± 3.27
Parity	
< 3	105 (53.3%)
> 3	92 (46.7%)
Mode of Delivery	
Vaginal delivery	184 (93.4%)
Cesarean section	13 (6.6%)
Estimated Blood Loss (ml)	995.69 ± 319.78
Hospital Stay (days)	2.99 ± 2.01
Vital Sign Details	
Mean Shock index	1.06 ± 0.34
Mean Heart Rate (beats / minute)	103.10 ± 16.21
Mean Systolic Blood Pressure (mmHg)	102.21 ± 20.62
Mean Diastolic Blood Pressure (mmHg)	64.73 ± 14.99
Mean arterial pressure (mmHg)	77.35 ± 16.42
Pulse Pressure (mmHg)	37.53 ± 11.34

Table II: Area Under the Curve with 95% Confidence Interval of Vital Sign predictors for Each Outcome

	Outcomes of Massive PPH			
Vital Sign	**Blood Transfusion**	**ICU Admission**	**Obstetric Hysterectomy**	**Maternal Death**
Shock Index	0.74 (0.63 - 0.84)	0.78 (0.67 - 0.88)	0.76 (0.64 - 0.89)	0.91 (0.83 - 0.98)
Heart Rate	0.69 (0.58 - 0.81)	0.73 (0.61 - 0.84)*	0.75 (0.61 - 0.89)	0.91 (0.83 - 0.98)
Systolic Blood Pressure	0.74 (0.63 - 0.84)	0.78 (0.69 - 0.87)	0.75 (0.62 - 0.87)	0.82 (0.66 - 0.99)
Diastolic Blood Pressure	0.71 (0.60 - 0.82)	0.73 (0.62 - 0.83)	0.73 (0.60 - 0.86)	0.76 (0.62 - 0.90)*
Mean Arterial pressure	0.74 (0.63 - 0.85)	0.76 (0.66 - 0.86)	0.75 (0.62 - 0.88)	0.81 (0.66 - 0.96)
Pulse Pressure	0.55 (0.43 - 0.66)*	0.61 (.050 - 0.73)*	0.60 (0.44 - 0.75)	0.67 (0.47 - 0.87)*

(p<0.05)*

As for all outcome variables the cutoff values of shock index were greater than 1 so the shock index was divided into two groups, less than or equal to 1 and greater than 1, to further evaluate its association with demographic and delivery related variables (table IV). It was noted that mean estimated blood loss, packed cell volume and heart rate were increased in women who had shock index greater than 1 and these variables with other vital signs showed statistically significant mean differences between the groups of shock index (p=<0.001). However, age, BMI, parity and mode of delivery were not significantly related with shock index.

DISCUSSION:

In this study the women who were referred with the diagnosis of PPH had a raised SI. The BMI of women indicated that most of them fell either in overweight or obese category. Obesity has been linked with PPH and increased risk for blood transfusion. Previously, a BMI of < 30 has been found to be associated with severe PPH.[8,9] In our study, BMI was not independently associated with a raised SI.

Table III: Performance of Shock Index in Prediction of the Outcomes of Massive PPH

Outcomes	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV (95% CI)	Prevalence (%)
Blood Transfusion					
SI = 1.15	65.6 (46.8-81.4)	79.4 (72.4-85.3)	38.2 (25.4-52.3)	92.2 (86.6-96.1)	16.24
ICU Admission					
SI = 1.28	64.5 (45.4-80.8)	87.9 (82.0-92.5)	50.0 (33.8-66.2)	92.9 (87.8-96.4)	15.73
Obstetric Hysterectomy					
SI = 1.37	55.6 (30.7-78.4)	88.8 (83.2-93.0)	33.3 (17.2-52.8)	95.2 (90.7-97.9)	9.14
Maternal Death					
SI = 1.42	80.0 (44.4-97.5)	89.3 (83.9-93.3)	28.6 (13.2-48.7)	98.8 (95.8-99.9)	5.07

PPV= Positive predictive values, NPV= Negative predictive values.

Table IV: Association of Shock Index With Demographic and Delivery Related Characteristics (n=197)

Characteristics	Shock Index		p-value*
	SI = 1 (n=113)	SI > 1 (n=84)	
Age (Years)	28.44 ± 4.92	29.06 ± 5.85	0.439
BMI (Kg/m^2)	27.83 ± 3.21	28.56 ± 3.32	0.129
Parity			
<3	61 (54.0)	44 (52.4)	0.824!
>3	52 (46.0)	40 (47.6)	
Mode of Delivery	Vaginal Delivery	103 (91.2)	81 (96.4)
	Cesarean Section	10 (8.8)	3 (3.6)
Estimated Blood Loss (ml)	888.05 ± 218.28	1140.48 ± 374.44	< 0.001
Packed Cell Volume	1.64 ± 1.24	3.06 ± 2.10	< 0.001
Heart Rate	94.34 ± 10.00	114.89 ± 15.51	< 0.001
Systolic Blood Pressure	113.10 ± 18.47	87.56 ± 12.85	< 0.001
Diastolic Blood Pressure	72.30 ± 13.16	54.54 ± 10.67	< 0.001
Mean Arterial Pressure	86.09 ± 14.32	65.60 ± 10.77	< 0.001
Pulse Pressure	40.71 ± 12.01	33.26 ± 8.79	< 0.001

Mean ± standard deviation or n (percentage) are reported. *p-value was calculated by Mann-Whitney U test. !p-value was calculated by Chi-square test.

Majority of the women in this study delivered vaginally. In a retrospective cohort of more than 30,000 vaginal deliveries, comparison of individual vital signs with SI, showed later to be a better parameter with 69% accuracy.[9] When compared with operative delivery, we did not find mode of delivery to be significant factor. In a retrospective case-control study, investigators found intrapartum SI to be raised in women who delivered vaginally.[10]

The SI was consistently found high with different adverse outcome. SI has been compared with individual vital signs in predicting adverse maternal outcome, in women with PPH and has been found to be more sensitive and specific than individual parameters. Our study also found individual comparison of vital signs with SI, better indicator for adverse outcome, when compared with heart rate and mean arterial pressure.

Our study found SI of > 1.15 (95% CI 0.63-0.84) for blood transfusion. In a study of 130 women with

PPH, reported SI of 0.9125 (0.815 sensitivity, 0.923 specificity) for blood transfusion.[11] In another study SI >1.1, predictive of blood transfusion in 89% of the cases.4 SI thus not only identifies blood loss, at the same time an increased SI also indicates need for blood transfusion. Hence, this can help in situations where hematologist is not available for guidance. Investigators have found raised SI more sensitive indicator of transfusion in dilutional coagulopathy, as compared to consumptive coagulopathy.[12]

Increase shock index in immediate postpartum period may help in identifying patients who are at increased risk of hemorrhage related complications.[13] We found SI of > 1.37 for obstetrical hysterectomy in study population. Maneschi et al observed SI of 1.5 as significant for obstetric hysterectomy.[14] A SI of 1.42 had high sensitivity (80%) and specificity (90%) for maternal death. Other investigators have also found SI >1.7 to be associated with all severe adverse maternal outcomes, including maternal death.[2,15]

LIMITATIONS OF THE STUDY

Our study did not take into account the presence of anemia and hypertension in women. Both conditions are known to have effect on SI, as pulse and systolic blood pressure are altered. If we assume these conditions might be higher in our study group, then the overall higher average SI in the study sample might be due to these underlying conditions. There might be some uncontrolled confounding effects of these characteristics on the study findings.

CONCLUSION:

SI is an important tool in the identification of critically ill patient. In obstetric practice, it not only helps in assessing the hemodynamic stability of the patient but also alerts about the need for blood transfusion and medical intervention and warns for appropriate referral.

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Causes, Frequency and Risk Factors of Burst Abdomen in Patients With Peritonitis

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ABSTRACT

Objective — *To find out the causes, frequency and risk factors of burst abdomen in patients presenting with peritonitis.*

Study design — *Cross sectional observational study.*

Place & Duration of study — *Surgical ward 2, Jinnah Postgraduate Medical Center (JPMC) Karachi, from September 2021 to September 2022.*

Methodology — *All the patients with peritonitis who presented through emergency department were included. Risk factors like anemia, diabetes mellitus, hypertension, obesity, respiratory infection, frequency of burst abdomen and causes like typhoid ileal perforation, tuberculous perforation, ruptured appendix, duodenal ulcer perforation, ruptured liver abscess were recorded on pre designed forms.*

Results — *The age of the 90 patients who presented with acute peritonitis was from 13 years to 65 years with the mean age of 39±5 year. There were 60 (66.67%) male and 30 (33.33%) female patients. Burst abdomen occurred in 24 (26.66%) patients. Causes of peritonitis were ruptured liver abscess (n=4 - 4.44%), colonic perforation (n=2 - 2.22%), intestinal tuberculous ileal perforation (n=9 - 10%), duodenal ulcer perforation (n=19 - 21.11%), ruptured appendix (n=17 - 18.89%) and typhoid ileal perforation (n=38 - 43.33%). The risk factors in burst abdomen were hypoalbuminemia (66.67%), postoperative respiratory tract infection/cough (41.67%), intra-abdominal collection (33.33%), anemia (8.3%), paralytic ileus (16.67%), obesity/BMI>30 (8.3%). A total of 66 (73.33%) patients recovered uneventfully.*

Conclusion — *The most common cause of peritonitis was typhoid ileal perforation and frequency of burst abdomen was 26.66% in this group of patients.*

Key words — *Burst abdomen, Peritonitis, Risk factors, Enteric perforation, Tuberculous ileal perforation.*

INTRODUCTION:

Abdominal wound dehiscence is a serious complication effect of laparotomy and causes high morbidity and mortality. Abdominal wound dehiscence is divided into partial and complete disruption. Emergency closure is necessary. If treated conservatively incisional hernia may occur. Burst abdomen is common in all genders and age groups and no significant difference is reported. However, number of risk factors are reported like smoking, diabetes mellitus, hypertension, connective tissue disease, chronic steroid therapy, malignancy, obesity, chronic cough and ascites.[1] Peritonitis is the major cause of burst abdomen (95%). During surgery inadequate peritoneal toilet and faulty surgical technique are important contributing factors.[2] In presence of risk factors, the frequency of burst abdomen

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increases.[3,4]

Most of the patients who develop burst abdomen are operated as emergency cases. Of these, about 49% patients have co-morbid. In such instance, abdominal closure technique in second procedure also plays its role. Application of tension sutures and layered closure during operation is preferred. The second procedure in patients with burst abdomen has a high mortality and a rate of 9.8% is reported.[5] Incidence of burst abdomen is high in old age group who have multiple co-morbid. These must be carefully managed preoperatively in elective surgeries. However, in emergency situation these co-morbid add to morbidity and mortality.[6]

Peritonitis is a common surgical emergency. The common causes for peritonitis as reported in literature include typhoid and tuberculous enteric perforation along with duodenal ulcer perforation and ruptured appendix. If the duration of peritonitis is more than 24 hours and patient develop septicemia, the incidence of burst abdomen is increased. This study was conducted to determine the causes of burst abdomen and its risk factors in a tertiary center so as to find out if any change has taken place over the years with advances in technology and healthcare facilities.

METHODOLOGY:

This cross sectional observational study was conducted at Surgery Ward 2 JPMC Karachi, from September 2021 to September 2022. Institutional review board approval was taken. Sample size was 90 who were enrolled after taking informed consent / assent. All the patients of peritonitis above the age of 12 years and gender were included. Patients of burst abdomen due to intestinal obstruction, malignancy and those operated as elective cases, were excluded.

Patients were diagnosed as having acute peritonitis on clinical grounds. They were admitted for exploratory laparotomy. A detailed history was taken including symptoms like abdominal pain, distension and vomiting. Signs of acute peritonitis like tenderness, rebound tenderness, rigidity and gut sound were recorded. X-rays chest and abdomen were advised to document the presence of free air and other features like intestinal obstruction. Investigations done in these patients included complete blood count, electrolytes, RFT. Ultrasound abdomen was also done. Patients were resuscitated in emergency room. After stabilization of vital signs and organ perfusion as noted by adequate urine output, exploratory laparotomy was performed. Findings at laparotomy like ileal perforation, ruptured appendix, ruptured liver abscess, duodenal perforation were recorded. The risk factors like diabetes mellitus, hypertension, anemia, and others were recorded as well. In patients of peritonitis who presented within two days, primary closure of the abdominal wound was done. Where indicated stoma was made. Postoperatively IV analgesics, antibiotics, fluids were continued. Wound was examined daily and if found disrupted and gut loops became visible, a diagnosis of burst abdomen made. Other variables recoded in postoperative period included cough, paralytic ileus - if gut sounds remained absent for more than 5 days, electrolyte imbalance, inter-loop collection on ultrasound. Data were entered and analyzed using SPSS version 23. Frequency of burst abdomen, and risk factors were determined. Descriptive statistics were used to present data as frequencies, percentages and 95% confidence interval.

RESULTS:

A total of 90 patients of acute peritonitis were managed during the study period. The age of the patients were from 13 years to 65 years with the mean age of 39±5 year. Most (n=60 - 66.67%) of the patients were males. Burst abdomen occurred in 24 (26.66%) patients. This was noted more frequently in males (n=14 -58.33%). Frequency of burst abdomen in patients with typhoid was 20.51%, and in duodenal perforation 31.57%. Details are given in table I. The risk factors of burst abdomen are given in table II. Hypoalbuminemia was the most common factor noted.

DISCUSSION:

In this study highest frequency of the burst abdomen was in patients of less than 40 years of age. This is different from another study where burst abdomen was reported more often in the 5th decade.[7] Males were more frequently involved in this study as observed in other study by Aksamija et al.[8] The most common cause of peritonitis in our study was typhoid ileal perforation followed by duodenal ulcer perforation. Different pattern is reported in a study by Kumar et al.[9] However, two most common conditions remained typhoid ileal and tuberculous perforations. The pattern is reflective of similar environmental and eating habits of people from India and Pakistan where gastrointestinal infections are more prevalent.

Frequency of burst abdomen in this study was 26.66% which is higher than that reported by Waqar et al where the rate of this complication was 12%.[10]

Table I: Distribution of Various Causes of Peritonitis and Frequency of Burst Abdomen

Cause of Peritonitis	Number of Cases (n %)	Number of Burst Abdomen (n %)	95% Confidence interval (CI)
Typhoid Ileal Perforation	39 (43.33%)	8 (20.51%)	10.01 - 35.26
Duodenal Ulcer Perforation	19 (21.11%)	6 (31.57%)	13.92 - 54.50
Ruptured Appendix	17 (18.89%)	4 (23.53%)	7.95 - 47.50
TB Perforation	9 (10%)	4 (44.44%)	16.05 - 75.96
Ruptured Liver Abscess	4 (4.44%)	None	-
Colon Perforation	2 (2.22%)	2 (100%)	-

Table II: Risk Factors of Burst Abdomen

Risk Factors	Total Number of Patients (n)	Burst Abdomen Cases (n %)
Hypoalbuminemia	26	16 (66.67)
Diabetes mellitus	04	2 (8.3)
Hypertension	03	2 (8.3)
Anemia	06	2 (8.3)
Postoperative respiratory tract infection	16	10 (41.67)
Paralytic Ileus	08	4 (16.67)
Intra-abdominal Collection	12	8 (33.33)
Obesity BMI>30 Kg/m^2	02	2 (8.3)

This difference is due to the inclusion criteria. We included only patients with acute peritonitis while they reported outcome of all surgical procedures performed in emergency. Burst abdomen is more common in peritonitis due to residual peritoneal abscess, paralytic ileus and other factors.

The most common risk factor in this study was hypoalbuminemia, cough and intra-abdominal collection. In another study hypoalbuminemia was most frequent factor followed by jaundice and uremia.[11] Acute malnutrition that leads to hypoalbuminemia is a major cause of burst abdomen therefore nutritional requirements of the patients must be addressed in postoperative period.[12] Cough is another important risk factor as it results in increased intra-abdominal pressure and leads to disruption of surgical wound. High protein diet through central line and diligent chest physiotherapy with early mobilization of the patients, are important measures to address these issues.

Suture material of adequate length was used in our study and adequate margins were taken during its application. In literature it is reported to ensure suture to wound length ratio as 4:1. The continuous suturing technique is reported as the best method to close the abdomen.[13] In a study wound infection and intra peritoneal abscess were the major factors leading to burst abdomen.[14] Same were the findings in our study. Postoperative cough was risk factor associated pulmonary diseases and is considered with as a major risk factor.[15]

The frequency of burst abdomen was high in this study. Two most common causes for the peritonitis were infective in nature. Typhoid ileal perforation due to salmonella and duodenal perforation due to H. Pylori were the offending agents. It is therefore important to create awareness and improve environmental as well as personal hygiene practices.

LIMITATIONS OF THE STUDY:

This study included patients with already established peritonitis thus frequency of burst abdomen was high. This is a single center study. A large multicenter research can provide more robust data on this subject.

CONCLUSION:

Frequency of burst abdomen was high in this study. Males were predominantly involved. The most common cause of peritonitis was typhoid ileal perforation and most common risk factor was hypoalbuminemia.

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Mazhar Iqbal: Review of the manuscript
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ORIGINAL ARTICLE OPEN ACCESS

Comparison of Effectiveness of Injection Sclerotherapy and Rubber Band Ligation for Second-Degree Hemorrhoids

Jahanzaib Babar,[1*] Maria Ahmed, [1] Hina Khan, [1] Khursheed Ahmed Samo [1]

ABSTRACT

Objective — *To compare the effectiveness of injection sclerotherapy (IST) and rubber band ligation (RBL) for second-degree hemorrhoids.*

Study design — *Comparative study.*

Place & Duration of study — *Surgical Unit 3, Civil Hospital Karachi, from August 2019 to February 2021.*

Methodology — *A total of 162 patients with the diagnosis of second degree hemorrhoids were included. They were randomly assigned into two groups of 81 patients each. In group I, 5% phenol in almond oil was used for sclerotherapy and in group R, rubber band ligation was performed. In a single sitting only two hemorrhoids were injected. Rubber bands were applied to all the hemorrhoids in single sitting by using Barron's gun. Effectiveness was labelled when no bleeding per rectum and prolapse of hemorrhoids occurred. Data were entered into SPSS version 20. The success of the two groups was compared by using Chi-square test. A p-value of <0.05 was taken as significant.*

Results — *The mean age of the patients was 43.64±11.27 year. There were 97 (59.9%) male and 65 (40.1%) female patients. Baseline characteristics were comparable between the two groups. Injection sclerotherapy was effective in 66.7% (54/81) of the patients while rubber band ligation was effective in 81.5% (66/81) of the patients. This was statistically significant in favor of rubber band group (p=0.03).*

Conclusion — *The outcome of rubber band ligation procedure was superior to the injection sclerotherapy group. It was found safe with low complication rate.*

Key words — *Hemorrhoids, Injection sclerotherapy, Rubber band ligation.*

INTRODUCTION:

Hemorrhoids is a common anorectal condition which is identified as the symptomatic dilatation of the anal cushions and their distal displacement.[1] The tissue that holds the vascular cushions in the anal canal get weakens thus causing the veins to become enlarged and the cushions to protrude.[2] Prevalence of the disease is thought to be 4.4% in general population.[3] This condition usually starts with per rectal bleeding followed by prolapse and, if left untreated, thrombosis of the veins.[4] Hemorrhoids are usually diagnosed on the basis of clinical examination.[5] Hemorrhoids are divided in to four grades according to the degree of prolapse. There are multiple treatment modalities used to treat this condition that include sclerotherapy, rubber band ligation, cryosurgery, conventional and stapled hemorrhoidectomy.[6]

Surgery is considered to be superior in terms of

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complete cure. However, many patients opt for non-operative management.[7] Non operative management of first and 2nd-degree hemorrhoids include changing dietary habits, lifestyle modifications and avoiding straining at defecation.[8] Different out-patient therapeutic methods are available for the hemorrhoids once conservative therapy is unsuccessful, like injection sclerotherapy and rubber band ligation. These are usually recommended in early uncomplicated stages of hemorrhoids and are done as day care cases.[9,10] Both therapies are been reported to be effective.[3,11] This study was conducted to compare the outcome of the two commonly employed techniques, IST and RBL, for evidence based decision making.

METHODOLOGY:

This comparative study was conducted at Surgical Unit-3 of Civil Hospital Karachi from August 2019 to February 2020.The sample size was n=162 with 81 participants in both the groups. The sample size estimation was achieved through the use of the OpenEpi software version 3.0. where, Alpha=5%, Power of the test 1- beta=80, an anticipated population proportion with hemorrhoids who underwent injections sclerotherapy was I=55.1% while those who underwent rubber band ligation was R=75.9%.[12]

Patients of hepatitis B, C or HIV infection, anal fissure or fistula, malignancy, congestive cardiac failure, chronic liver disease, COPD and stroke were excluded from the study.

They were randomly allocated using sealed opaque envelop bearing group I - patients who underwent injections sclerotherapy and group R - patients who underwent rubber band ligation. Departmental approval was obtained for this study. Patients were informed about the type of study design and allocation into each group. Both the surgical interventions are accepted method of treatment.

INJECTION SCLEROTHERAPY GROUP I: Patients were informed about the method and placed in the left lateral position. After proctoscopy, the obturator was removed, a disposable syringe with a spinal needle of 20-gauge, filled with 5% phenol in almond oil was inserted into the pedicle in submucosal plane above the dental line. In one session, at the base of each hemorrhoid, around 3 to 5ml of the sclerosing agent was injected. Only two hemorrhoids were injected at one time. Patients were counseled about feeling of heaviness and tenesmus after the procedure.

RUBBER BAND LIGATION GROUP R:: In RBL (R group), each patient was counseled about the procedure. Barron's gun was used for the application the rubber band at the level of pedicle of the hemorrhoids. After proctoscopy, hemorrhoidal tissue was grasped with tissue forceps through Barron's gun and rubber band was placed. Patients were asked to visit on the 15th post-procedure day and asked about the resolution of symptoms; bleeding and prolapse of hemorrhoids.

Effectiveness was assessed by the resolution of the symptoms (bleeding and prolapse of hemorrhoids) and regression of hemorrhoidal tissue on proctoscopic examination on 15th post-procedure day.

The quantitative variables of age and duration of surgery were analyzed using SPSS Version 20 by calculating the mean and standard deviations. For the qualitative variables like gender, diabetes mellitus type II (FBS >126mg/dl/ 02 hr. RBS >200mg/dl), hypertension (systolic BP 140 mmHg/diastolic BP 90 mmHg), smoking status (history), BMI and efficacy, frequencies and percentages were measured. The success of the two groups was compared by using Chi-square test. A p-value of <0.05 was taken as significant.

RESULTS:

There were 81 patients in each group. The mean age of the patients was 43.64±11.27 year. There were 97 (59.9%) male and 65 (40.1%) female patients. Of the total 49 males were in group I and 32 in group R while 48 females were in group I and 33 in group R. More than 50% of the patients had diabetes mellitus, 46.3% were hypertensive and 32.1% smokers. Baseline characteristics of the study participants are given in table I. Effectiveness of the intervention in both the groups is given in table II. The difference was statistically significant (p=0.03) in favor of group R.

DISCUSSION:

Hemorrhoids are one of the common anorectal pathologies. It is quite prevalent in Pakistan however, many patients are reluctant to either disclose the symptoms, get examined or seek treatment. They prefer to avoid surgery till no option is left. There is a great fear of pain following surgery and hospitalization. In this study rubber band ligation and injection sclerotherapy were offered to patients with second degree hemorrhoids. Both the procedures are extensively practiced. They are reported as quick, simple, affordable procedures with high patient compliance and satisfaction.[13]

Table I: Baseline Characteristics of the Study Participants

Variables	Group I n=81		Group R n=81	
	Mean (n)	Standard. Deviation (±)	Mean (n)	Standard. Deviation (±)
Age (Years)	42.93	11.25	44.35	11.32
Weight (Kg)	73.89	15.97	71.96	17.10
Height (cm)	161.93	10.26	162.07	9.75
BMI (Kg/m^2)	28.23	6.24	27.42	6.15
Duration of surgery (minutes)	4.81	1.73	5.54	1.59

Table II: Comparison of Effectiveness of Intervention Between the Groups

Effectiveness of The Intervention	Group I n=81	Group R n=81	Total	p- Value
Yes	54 (66.7%)	66 (81.5%)	120	0.03
No	27(33.3%)	15 (18.5%)	42	

Chi-Square =4.629

The male gender predominance in our study is well correlated with the reported literature.[14] However, Lee performed rubber band ligation for higher number of female cases.[15] Many researchers suggest that banding can be performed in one session. We follows the same protocol and performed single session of band ligation dealing with all the hemorrhoids. RBL is regarded as an efficient conservative technique, but many patients have discomfort for several days after the procedure.[16] IST is similarly effective, but it is not free from occasional serious complications such as retroperitoneal sepsis, perianal abscess, necrotizing fasciitis of the perineal region and at times severe urological damages.[17,18]

In a meta-analysis of 23 clinical trials evaluating treatment for internal hemorrhoids it was concluded that sclerotherapy is less efficient than all other modalities of treatment.[19] Another review compared sclerotherapy, rubber band ligation, and infrared coagulation and concluded that rubber band ligation is an effective treatment.[20] Our study shows high efficacy of 81.5% with rubber band ligation. In a study it was found that band ligation is not only a simple and non-invasive technique for the treatment of hemorrhoids, but also cost-effective, with less postoperative infection rate.[21] It is advised that in cases of first and second-degree hemorrhoids, RBL must be regarded as the method of choice.[22] We concur with these observations.

CONCLUSION:

Rubber band ligation was found superior to injection sclerotherapy in its effectiveness for the treatment of second degree hemorrhoids.

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Practices of Personal Protective Equipment Use Amongst Surgeons and Anesthetists During The COVID-19 Pandemic

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ABSTRACT

Objective — *To explore the practices of personal protective equipment (PPE) amongst the surgeons and anesthetists during the COVID-19 pandemic.*

Study design — *Cross-sectional study.*

Place & Duration of study — *Department of Surgery, Dow University of Health Sciences Karachi, from June 2021 to May 2022.*

Methodology — *Anesthetists and surgeons from various specialties practicing in constituent institutions of Dow University of Health Sciences (DUHS) were approached via email. After taking institutional review board (IRB) approval and informed consent, a validated questionnaire was send via email which was filled out by all the participating surgeons and anesthetists. The data were entered and analyzed using SPSS version 26. Chi square test was applied to find out the significance of the study variables.*

Results — *A total of 105 participants filled the questionnaire. Only forty-one (39%) participants had read WHO guidelines for surgery during COVID-19, pandemic. Forty-six (43.8%) healthcare professionals (HCPs) working in ORs had undergone training to don and doff PPE, and 46 (43.8%) reported any changes made to the ORs after the pandemic. More consultants were practicing donning coverall suits in OR compared to post-graduate trainees (PGTs) (p=0.004), whereas more PGTs underwent training for PPE-donning and doffing compared to the consultants.*

Conclusion — *There was a wide variation in the practices of PPE use among surgeons and anesthetists working in ORs during the COVID 19 pandemic.*

Key words — *COVID-19, Surgeons, Anesthetists, Personal protective equipment.*

INTRODUCTION:

The SARS-CoV-2C (COVID-19) disease that started in 2019 in China later spread to the whole of the world and declared as a pandemic by World Health Organization (WHO) in March 2020.[1,2] The intensity of this disease has waned over the years but not resolved completely. Health care workers (HCWs) are at an increased risk of the infection either through direct contact with the patients or indirect contact through multiple sources. In addition, HCWs are more likely to get infected than the general population.[1,3] WHO and the United States Centre for Disease Control and Prevention (CDC) have prepared standard SOPs for HCW that include utilization of PPE.[4] Adequate use of the PPE is reported to decrease the risk for infection.[1,5]

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Amongst HCWs, surgeons and anesthetists are at a higher risk of getting this infection.[6] Procedures like tracheal intubation, mechanical or non-invasive ventilation, tracheotomy, bronchoscopy as well as surgeries involving the respiratory tract, nose or oropharynx are particularly a high risk.[6] Various guidelines have been outlined by international organizations for specific surgical procedures during COVID-19 pandemic.[7] WHO has also provided some general guidelines for the operating room (OR).[6,8] However, it was observed that many of the HCWs were did not follow the SOPs during the pandemic. Many deaths amongst HCWs were also reported. This study was conducted to determine the practices of PPE use, and availability of PPE as well as the compliance to WHO guidelines by surgeons and anesthetists at one of the tertiary care hospitals in Pakistan so as to understand the pattern of working and attitude of HCWs during pandemic at their workplace.

METHODOLOGY:

A cross-sectional study was conducted from June 2021 to May 2022 at DUHS Karachi. IRB approval was obtained. Purposive sampling technique was used. Surgeons and anesthetists from all specialties, both consultants and post-graduate trainees employed in DUHS, who had worked in the OR during the COVID-19 pandemic were eligible and approached for this study. Surgeons and anesthetists who had abandoned/stopped their practice during COVID-19 pandemic were excluded from the study.

Participants were approached via email citing the link of the online semi-structured, pre-tested questionnaire. The identity of the participants and information retrieved were kept confidential. Data were entered and analyzed by SPSS version 21. Frequency and percentages were calculated for qualitative data like gender and place of practice while mean and standard deviation were calculated for quantitative data like ages and years of practice. Stratification was done with reference to the age, gender, and years of practice to control the effect modifier. Chi-square test was applied to find out the effect of these on outcome variable. A p value <0.05 was taken as significant.

RESULTS:

A total of 105 surgeons and anesthetists responded to the invitation and filled the online questionnaire. Mean age of the respondents was 35.17±8.797 year. Most of participants were married, living with the family and having elderly family members. Most of the responders were PGTs. Among the consultants, majority of the respondents were general surgeons, anesthetists, and obstetricians. Among the respondents 88 (83.8%) had already suffered from COVID-19 disease themselves and 32 (21.9%) had reported deaths in their families from the disease (table I).

Eighty-seven (82.9%) respondents agreed that their OR practice has changed. Surgical masks were used by 67 (63.8%) OR professionals followed by KN95 and N95 masks. Eye protection, coverall suits were used by less than 50%. Face shields were used by none of the respondents. Fort-six (43.8%) healthcare professionals (HCPs) working in ORs had undergone training to don and doff PPE. Only 46 (43.8%) told that there were changes made to the ORs after the pandemic. To the questions regarding the details of changes made, 38 (36.2%) concurred that they have separate PPE-donning and doffing rooms designated in their OR while only mirrors and posters demonstrating don/doff guidelines were available to 3 (2.9%) and 19 (18.1%) respectively. Though 70 (66.7%) of OR- HCPs had a dedicated OR for COVID-19 suspected and positive patients and measures like decreased traffic of staff in OR and door closure during surgery were undertaken but negative pressure system installation and high ventilation rates for 15-20 air changed per hour were only available to few. Forty-one (39%) reported to have read WHO guidelines for surgery during COVID-19 pandemic (table II).

In this study, males practiced donning eye protection more frequently (p=0.000) and coverall suits in OR (p=0.003), while more female OR-HCPs had undergone PPE donning and doffing training (p=0.004). Upon stratification on the basis of consultants and PGTs, the data showed that more consultants were practicing donning coverall suits in OR compared to PGTs (p=0.004), whereas more PGTs were provided training for PPE-donning and doffing compared to the consultants (p=0.011). The rest of the responses were statistically similar from both the strata with p>0.05.

The medical fields that practiced a stricter use of N95 masks were oral maxillofacial surgery (100%), pediatric surgery (100%), anesthesia (85.7%), ENT (83.3%) and general surgery (81.3%). Coverall suits were mostly worn by oral maxillofacial surgeons (100%), pediatric surgeons (100%) and neurosurgeons (66.7%). Lastly, eye protection was the most practiced by oral maxillofacial surgeons (100%) and orthopedic surgeons (53.8%).

Table I: Demographics of the Study Participants

Variables		Number (%)
Gender	Male	45 (42.9%)
	Female	60 (57.1%)
Relationship	Single	41 (39%)
	Married	64 (61%)
How many family members live with you?	None	1 (1%)
	1-5	83 (79%)
	More than 5	21 (20%)
Are elderly members over the age of 60 years living with you?	Yes	68 (64.8%)
	No	37 (35.2%)
Did anyone in your family have COVID-19?	Yes	42 (41%)
	No	62 (59%)
Did you yourself had COVID-19 disease?	Yes	88 (83.8%
	No	17 (16.2%)
Did anyone in your family die of COVID-19 disease?	Yes	32 (21.9%)
	No	82 (78.1%)
Specialty	Cardiothoracic	2 (1.9%)
	General surgery	32 (30.5%)
	Neurosurgery	6 (5.7%)
	Oral/maxillofacial	1 (1%)
	ENT	6 (5.7%)
	Pediatrics	2 (1.9%)
	Orthopedics	13 (12.4%)
	Vascular	5 (4.8%)
	OBGY	17 (16.2%)
	Anesthesia	21 (20%)
Are you a Consultant or PGT?	Consultant	33 (31.4%)
	PGT	72 (68.6%)
Years of practice	Less than1	09 (8.6%)
	One to five	41 (39%)
	Six to ten	40 (38.1%)
	Eleven to twenty	11 (10.5%)
	More than 20	04 (3.8%)

DISCUSSION:

Preventive measures are considered important in decreasing the spread of COVID 19 disease. This is one of the key messages learnt since the beginning of the pandemic from China.[9] HCPs are required to use PPE in order to protect themselves. There are number measures that can be adopted to achieve the goal.[10] SARS-CoV-2 transmission takes place via particles or droplets containing the virus as well as aerosol, via fomites and subsequent direct contact.[11-12]

The HCPs belonging to certain disciplines such as maxillofacial, ENT are more prone to get the infection since nasopharyngeal and oropharyngeal mucosal membranes have high viral load.[13] For all intimate and close contact situations that may arise during examining or treating the patients, full PPE is advocated.[13] Laparoscopic and other endoscopic should only be performed when there is no other option, and full PPE should be practiced during laparotomy.[14] Similar suggestions have been proposed by other professional bodies. In this study the practices related to PPE were not uniform. Facio-maxillary surgeons, ENT surgeons, anesthetists

Table II: Details of Responses

Questions	Responses	Number (%)
Did your OR practices change during COVID-19?	Yes	87 (82.9%)
	No	18 (17.1)
Which type of mask you used in the OR?	Surgical mask	67 (63.8%)
	KN95	30 (28.6%)
	N95	8 (7.6%
Did you wear coverall suit in OR?	Yes	25 (23.8%)
	No	68 (64.8%)
	Sometimes	12 (11.4%)
Did you wear eye protection cover in OR?	Yes	37 (35.2%)
	No	52 (49.5%)
	Sometimes	16 (15.2%)
Did you use face shield in OR?	Yes	0 (0%)
	No	105 (100%)
Were there separate rooms for donning & doffing PPE?	Yes	38 (36.2%)
	No	67 (63.8%)
Are there floor demarcation for clean and contaminated areas?	Yes	3 (2.9%)
	No	102 (97.1%)
Were mirrors provided in donning and doffing areas?	Yes	3 (2.9%)
	No	102 (97.1%)
Were observational windows installed?	Yes	3 (2.9%)
	No	102 (97.1%)
Were sanitizer dispensers installed in OR?	Yes	30 (28.6%)
	No	75 (71.4%)
Does your ORs have AGSS installed?	Yes	2 (1.9%)
	No	103 (98.1%)
Were posters displayed for donning and doffing guidelines?	Yes	19 (18.1%)
	No	86 (81.9%)
Were changes made to OR rooms?	Yes	46 (43.8%)
	No	59 (56.2%)
Was donning and doffing training provided?	Yes	41 (39%)
	No	64 (61%)
Were dedicated OR for COVID-19 positive and suspected patients present?	Yes	70 (66.7%)
	No	35 (33.3%)
Were anesthesia and intubation undertaken in negative pressure?	Yes	20 (19%)
	No	83 (79%)
	Don’t know	2 (1.9%)
Was there limited number of OR staff / essential personnel allowed only?	Yes	58 (55.2%)
	No	47 (44.8%)

Was high ventilation rate of 15-20 air changes per hour maintained in OR during surgery?	Yes	25 (23.8%)
	No	30 (28.6%)
	Don't know	50 (47.6%)
Were doors of OR closed during surgery?	Yes	59 (56.2%)
	No	37 (35.2%)
	Sometimes	9 (8.6%)
Have you read WHO guidelines for surgery during COVID-19 pandemic?	Yes	41 (39%)
	No	64 (61%)

and pediatric surgeons were more compliant than other consultants.

According to our study, only 57.8% male surgeons and 53.3% female surgeons reported that the OR staff was limited to essential personnel, thus highlighting the need to train OR personnel on how to enforce and follow international guidelines to prevent COVID-19 transmission. In our study, 22.7% male surgeons and 16.7% female surgeons reported the conduction of anesthesia and intubation in negative pressure ORs even though this set up is recommended in guidelines.[15] Negative pressure systems in ORs make sure that laminar flow is such that the air flows upwards from the surgical field.[16] Placing, exchanging and removing ETT should be performed in a negative pressure enabled OR or ICU.[16] In a situation of unavailability of negative pressure OR, intubation and extubation should be undertaken in a negative pressure ward or negative pressure intensive care unit. Employing portable high efficiency particulate air (HEPA) filter should be used in very high-risk cases where negative pressure alone is inadequate.

There is no doubt that an efficient usage of PPE has played a life-saving role globally amidst the COVID-19 pandemic for all HCPs, including surgeons. However, due to a lack of awareness, basic training and inadequate implementation of international guidelines, the usage of PPE among surgeons in our set up was not satisfactory. Such practices should be taken into account by the quality assurance department. A regular update must be provided to the surgeons and other HCPs including residents so as to ensure compliance with internationally accepted protocols. Logistics related provisions must also be adhered to so as to keep working environment safe for both the HCPs and patients.

LIMITATIONS OF THE STUDY:

The COVID 19 pandemic is over now. However, the data from a single university hospital added into evidence based medicine literature how HCPs varied in their clinical practices during the pandemic. A qualitative study as to why many of the study participants did not comply with international guidelines worth exploring. This may be conducted at a country level by professional organizations and societies.

CONCLUSION:

The study revealed the wide variation in PPE use practices, safety protocol implementation and compliance, availability of safety equipment and installations in healthcare settings. The reasons for lack of compliance to safe practices is another area that need attention.

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CASE REPORT OPEN ACCESS

Duodenal Tuberculous Stricture With Multiple Jejunal and Ileal Strictures: A Rare Cause of Intestinal Obstruction In A Child

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ABSTRACT

Duodenal obstruction in children usually occurs due to congenital anomalies like malrotation of the gut, congenital bands and duplication of the duodenum or may be due to acquired lesions like lymphoma. The duodenum is infrequently involved in paediatric patients due to tuberculosis especially intrinsic obstruction is extremely rare. Only few cases are reported in the literature related to intrinsic tuberculous duodenal obstruction in children. We are reporting a case of ten-year-old girl who presented with the symptoms of intestinal obstruction. Diagnosis of intrinsic tuberculous duodenal stricture along with multiple jejunal strictures was made at surgical exploration.

Key words *Abdominal tuberculosis, Duodenal obstruction, Duodenal tuberculosis, Duodenal stricture, Child.*

INTRODUCTION:

Childhood tuberculosis is still a major public health problem in the developing countries including Pakistan. Children usually acquire infection from other family members. The extra pulmonary tuberculosis is found in11%-16% of all the patients of tuberculosis of which about 3% to 4% include abdominal tuberculosis. Ileocecal area is the most commonly involved site due to the abundance of lymphoid tissue (Peyer's patches). Rarely tuberculosis may involve stomach, duodenum and esophagus.[1-4] In this manuscript we report a rare site and unusual presentation of tuberculosis of small bowel in a girl.

CASE REPORT:

A 10-year old female resident of lower socio-economical area of Karachi weighting 15 kg (below 5th centile), height 116 cm (between25th and 50th centile), referred from other hospital to emergency department with the complaint of colicky abdominal pain, abdominal distention, and bilious vomiting that occurred off and on for the last two months. Patient remained under treatment in the private clinics where intravenous fluids and injections were prescribed. Finally, she was referred out due to the aggravation of clinical symptoms with impression of intestinal obstruction. Past history was not significant except for failure to thrive noted over the last two years. There was no family history of tuberculosis. The girl was fully vaccinated according to the EPI schedule. BCG scar mark was also present.

On examination the girl was found emaciated, with pallor. The vitals were heart rate 120 beats /min, respiratory rate 28 breath/min, temperature of 99^{o} F. The already placed nasogastric tube showed bilious aspirate. Chest examination was unremarkable. Abdomen was distended with visible peristalsis from left to right without any tenderness. The initial impression was duodenal obstruction secondary to intraluminal web or congenital bands. The blood investigations were almost in the normal range with hemoglobin of 10 gm/dl, and serum albumin 3.1gm/dl. Supportive treatment was started with addition of peripheral line parenteral nutrition. CT scan abdomen with contrast showed hugely dilated stomach and duodenal loops (Fig-I and II).

Laparotomy was done after stabilization through right supra umbilical transverse incision. On opening the abdomen, hugely dilated stomach and duodenum up to its 3rd part was found. Multiple strictures were also noted in the small bowel including jejunum and ileum (Fig-III). Enlarged mesenteric lymph nodes

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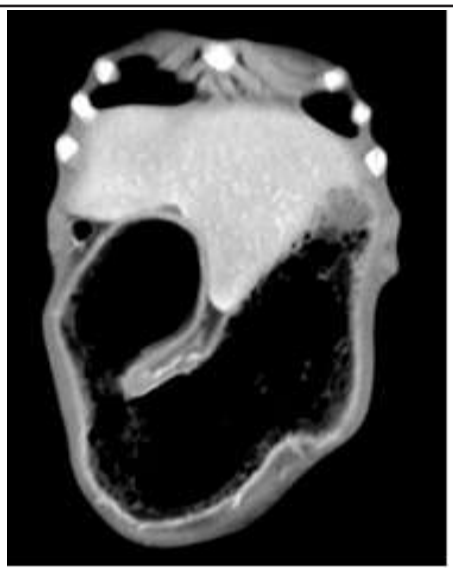

Fig. I: CT scan, showing dilated stomach and duodenal loops.

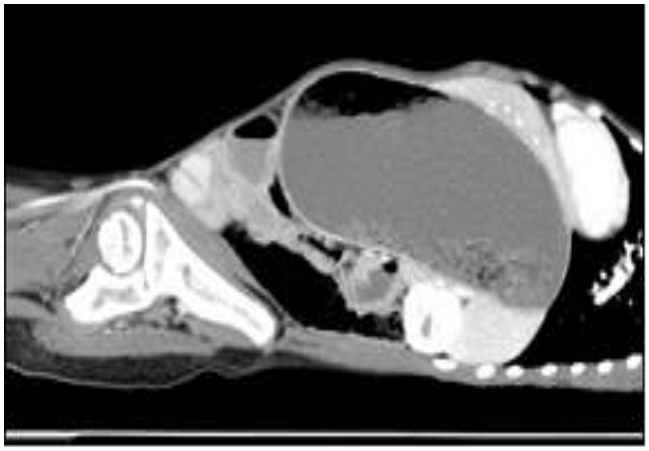

Fig II: CT scan, showing dilated stomach reaching up to the pelvis

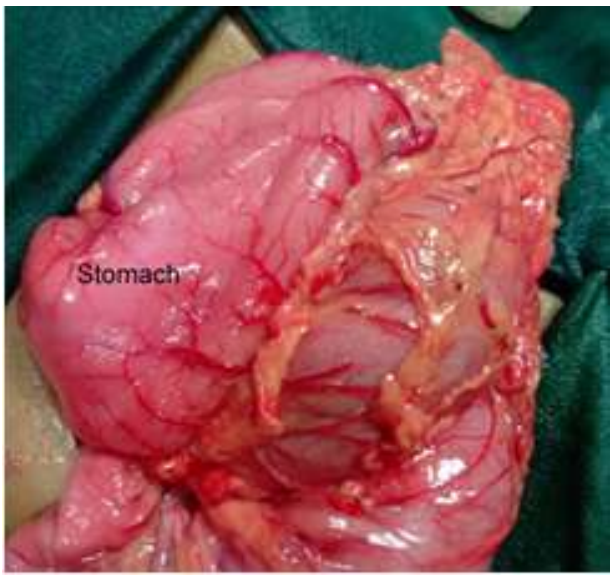

Fig III: Hugely dilated stomach and duodenum till its 3rd part

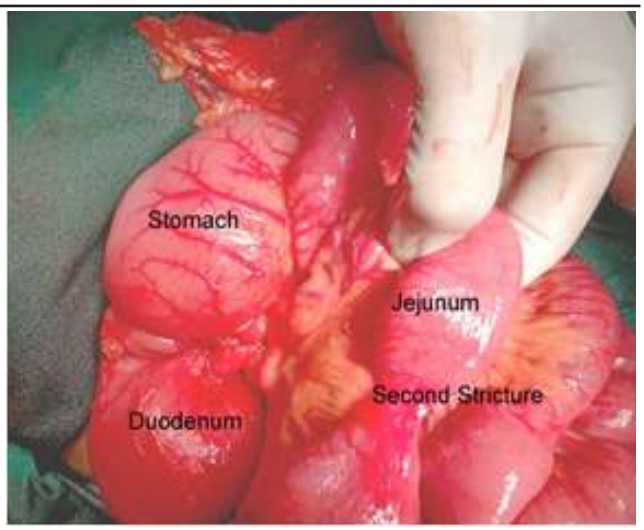

Fig IV: Enlarged mesenteric lymph nodes. First stricture at 3rd part of the duodenum causing almost complete obstruction and jejunal strictures.

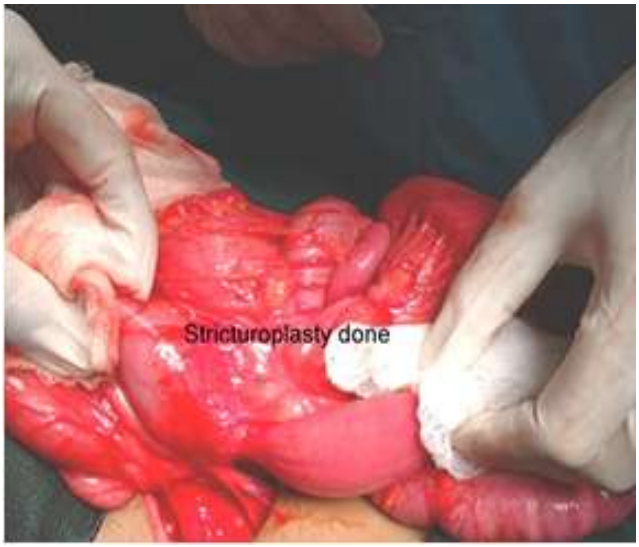

Fig V. Jejunal stricture after stricturoplasty.

were also present. First stricture at the 3rd part of duodenum was causing almost complete obstruction. This was dealt with side to side duodeno-duodenal anastomosis (Fig-IV). Distal to this, two more strictures in proximal jejunum causing partial obstruction were found and stricturoplasty done (Fig-V). Three subsequent narrowing not causing obstruction in jejunum and ileum were left as such. Mesenteric lymph nodes biopsy was taken. The findings raised the suspicion of tuberculosis. Postoperative recovery was smooth. Anti-tuberculous therapy was started after receiving histopathology report which showed congestion, inflammatory infiltrates, edema, dense fibrosis and inflammation. Lymph node had multiple granuloma with Langerhans type giant cells and caseous necrosis. At follow up general condition of the patient improved with weight gain of 7 kg in 45 days. Family screening was also advised.

DISCUSSIONS:

Abdominal tuberculosis is 6th most common site of extra pulmonary tuberculosis. It is less common in children.[1] The ileocecal region is most commonly involved.[2] Duodenum is a rare site to be involved with tuberculosis. The largest published series of duodenal tuberculosis reported 30 cases from India involving adult population.[3] Third part of the duodenum was the most commonly affected site. Duodenal obstruction may result from within or due to extrinsic compression by enlarged periduodenal lymph nodes.[2] Duodenal obstruction in children usually occurs due to congenital anomalies. However, it is an infrequent site to get involved in tuberculosis as noted in our patient.[4]

The clinical manifestations of duodenal tuberculosis are varied and non-specific. A high index of suspicion is needed for making a preoperative diagnosis. The causative agent. The mycobacterium tuberculosis which is an acid fast bacillus, is rarely isolated in such cases. The diagnosis of abdominal tuberculosis is usually made on the histological evidence of tuberculosis with caseation necrosis. Lingenfelser et al suggested to include clinical manifestations as suggestive of tuberculosis, imaging support with histopathological or microbiological evidence and/or therapeutic response to treatment as criteria for diagnosing the disease.[5] The Gene Xpert MTB RIF assay is another laboratory test used for the diagnosis.[2]

Laparoscopy and biopsy can help in making a diagnosis as reported in a series of 35 children from Turkey.[6] In our case laparoscopy was not done as patient had intestinal obstruction with massive abdominal distension. In index case pulmonary involvement was also not found. However, this has been reported in approximately 50% of patients with abdominal tuberculosis.[1] Barium studies can demonstrate site of narrowing either extrinsic or intrinsic type.[7] Superior mesenteric artery syndrome was one of the differential diagnosis with which patient was referred to us. In this condition third part of the duodenum is compressed. Laparotomy and histological examinations of the lymph nodes are necessary for a definitive diagnosis as noted in our study.[3]

Therapy with standard antituberculous drugs is usually highly effective for intestinal tuberculosis. Surgery is usually reserved for patients who have developed complications, including intestinal obstruction and perforation. Obstruction is the most common complication in patients with tuberculosis. Patients with multiple and long strictures are less likely to respond to medical therapy. However, in some patients, intestinal obstruction may manifest as a result of cicatrization after starting antituberculous treatment.[8] The surgical resection should be conservative as done in our patient. Multiple small bowel strictures may be treated by stricturoplasty to preserve bowel length as done in the index case.[9]

CONCLUSION:

Duodenal tuberculosis is a rare and difficult to diagnose preoperatively in children. A high index of suspicion is required especially in geographical locations where tuberculosis is not uncommon.

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Shumaila Israr: Concept, literature review, manuscript writing.

Jamshed Akhtar: Concept, literature search, manuscript editing.

Both authors approved final draft of the manuscript.

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Ethical statement / consent of the patient**:** The consent was taken from the parents to report this case for educational purpose. Confidentiality was maintained while preparing the manuscript.

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