ORIGINAL ARTICLE

Outcomes of Herniotomy in Young Adults with Primary Indirect Inguinal Hernia: A Single-Center Quasi-Experimental Study at Tertiary Care Setting, Rawalpindi

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ABSTRACT

Objective: To determine the outcomes of herniotomy in young adults with inguinal hernia.

Study Design: Quasi-experimental study.

Place and Duration of Study: The study was conducted at the Department of Surgery, Combined Military Hospital (CMH) Rawalpindi, Pakistan, from January 2022 to January 2024.

Methods: Sixty-nine young patients aged between eighteen and forty years, both male and female, who presented with inguinal hernia at the surgical outpatient department were included in the study. Patients aged less than eighteen or more than forty years, those with a previous history of inguinal hernia repair, those with bilateral hernia, those with direct inguinal hernia, those with chronic cough, and pregnant females were excluded. All patients underwent herniotomy for hernia repair (performed by a surgeon with a minimum of 5s years of experience) as per standard procedural guidelines. All patients were assessed for outcomes at 6 weeks post-surgery, including pain, infection, and recurrence. Data was analyzed using SPSS 22.

Results: Mean age of patients was 31.46 ± 3.96 years. There were 57 (82.61%) male and 12 (17.39%) female patients. Mean BMI of the patients was 19.36 ± 1.38 kg/m2. Mean size of the hernia sac was 4.74 ± 0.75 cm. Mean duration for which the patient had a hernia before surgery was 10.61 ± 2.56 months. Incidence of pain after six weeks of herniotomy was 7 (10.14%). Incidence of recurrence of hernia at six-week follow-up was 3 (4.35%). The incidence of infection after six weeks following herniotomy was 1 (1.45%).

Conclusion: The recurrence rate and incidence of pain and infection at six weeks after herniotomy are quite low at 4.35%, 10.14%, and 1.45%. This demonstrates that this procedure can be adopted as a good and safe alternative to mesh repair in the younger population with inguinal hernia.

Keywords: *Indirect Inguinal Hernia, Infection, Pain, Recurrence, Young Adults*.

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Introduction

Surgical repair of the hernia is one of the most commonly performed operations with reported 300,000 surgeries performed within a short span of 2010 to 2019.[1] An inguinal hernia is caused by a defect in the layers of abdominal musculature, resulting in the protrusion of structures.[2] It is easily diagnosable among the male population, in which a simple physical examination can be diagnostic.[3] Despite being a very common surgical morbidity, when it comes to its treatment, a lot of controversies exist, like the decision of timing of surgery, type of surgery, technique to be opted for surgery, and invasiveness of surgery.[4]

In general, the preferred technique used by surgeons is minimally invasive laparoscopic surgery with mesh implantation over the repaired defect.[5] There are several advantages that mesh inguinal hernia repair offers, amongst which the most important ones

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include reduction in the recurrence of the inguinal hernia.[6] However, one of the major complications of mesh repair is its association with the development of chronic pain in the long run.[7] Therefore, there is a need for an alternative option, particularly in young patients, that can ensure effective repair as well as avoid chronic pain. One such option is "herniotomy," in which a minimum level of dissection is performed, and mesh is not put in place.[8] In fact, in a recent comparative study conducted in a younger population (having an average age of 20 years), mesh and no-mesh repair were assessed, and it was found that even in terms of recurrence, the no-mesh group showed much lower rates of recurrence of inguinal hernia.[9]

These findings strongly favor the hypothesis that herniotomy may serve as a highly useful alternative to the preferred method of repair of inguinal hernia, i.e., mesh inguinal hernia repair in the younger population. However, when it comes to the benefits of this procedure in the local population of Pakistan, not much literature is available. In addition, even at the global level, the usefulness of this procedure has not been studied extensively, as hernia in young adults is not that common. Therefore, to address this literature gap, this study was conducted with the aim of determining the outcome of herniotomy in young adults with inguinal hernia.

Methods

This quasi-experimental study was conducted at Department of Surgery, Combined Military Hospital (PEMH), Rawalpindi, Pakistan, from January 2022 to January 2024, after obtaining approval from the Ethical Review Board of the institution, vide letter no: 531, dated 11th November 2021. Using the WHO sample size calculator, the required sample size for the study was determined. The formula that was used to determine the sample size was:

$$n = z^2_{1-\frac{a}{s}} P(1-P)/d^2$$

This was done by assuming: confidence level = 95%, absolute precision = 5%, anticipated recurrence of inguinal hernia after herniotomy = 4.7%.[8] The calculation yielded a sample size of 69. Young adults aged between 18 and 40 years, both males and females, who presented in the outdoor department with indirect inguinal hernia were included in the study. Patients aged less than 18 and more than 40 years, with a previous history of inguinal hernia repair, had bilateral hernia, had direct inguinal hernia, had chronic cough, and pregnant females were excluded from the study. Patients in this study were recruited by using a non-probability consecutive sampling technique.

Informed consent was obtained from all the patients. Once selected, baseline characteristics of included patients, including their age (in years), gender (male/female), body mass index (BMI), and duration of hernia, were documented by the researcher. Pre-operatively, an ultrasound was performed to assess the hernia sac. After this, all the patients were briefed regarding the herniotomy procedure as well as spinal anesthesia under which the surgery was performed. After administration of anesthesia by a consultant anesthetist (having a minimum of two years of experience), the patient was draped, and the site was cleansed as per standard hospital protocol to create an aseptic environment. Herniotomy was performed in all patients by a single team of surgeons (with a minimum of 5 years of experience) to minimize operator bias. During this procedure, removal of the hernia sac was performed through an open technique in which, after making an incision and exploring the sac, it was removed without repairing the posterior wall or placing any type of mesh. In addition, the dissection of the surrounding tissue was also minimal.[10] No drain was placed at the operative site. Patients were kept admitted only for 1 day after the surgery and were given simple analgesia (tab paracetamol 1g PO x TDS) for pain. In case of severe pain, breakthrough analgesia was provided with (tab tramadol HCL 50mg PO x SOS). After one day, patients were discharged home and were asked to revisit the surgical site at six weeks after the procedure. At this visit, patients were assessed for the outcomes, i.e., infection, presence of pain at the operative site [defined as pain visual analog scale (VAS) score of more than two], and recurrence of hernia. In case of recurrence, repeated surgery to repair the hernia was performed.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.00. Quantitative data were represented using mean ± standard deviation (SD). Qualitative data was

represented using percentages and frequencies.

Results

In this study, there were 69 patients. The mean age of patients was 31.46 ± 3.96 years. There were 57 (82.61%) male and 12 (17.39%) female patients. Mean BMI of the patients was 19.36 ± 1.38 kg/m2. Mean size of the hernia sac was 4.74 ± 0.75 cm. Mean duration for which the patient had a hernia before surgery was 10.61 ± 2.56 months. These baseline characteristics are presented in Table 1 below.

Table 1: Baseline characteristics of patients (N = 69)

Age	
Mean ± Standard deviation (SD)	31.46 ± 3.96 years
Gender	N (%)
Male	57 (82.61%)
Female	12 (17.39%)
Body Mass Index (BMI)	
Mean ± Standard deviation (SD)	19.36 ± 1.38 kg/m2
Hernia sac size	
Mean ± Standard deviation (SD)	4.74 ± 0.75 cm
Duration of hernia	
Mean ± Standard deviation (SD)	10.61 ± 2.56 months

Table 2: Outcomes of herniotomy at six weeks follow up (N = 69)

Pain after 6 weeks of surgery [N (%)]	
Yes	7 (10.14%)
No	62 (89.86%)
Recurrence of hernia [N (%)]	
Yes	3 (4.35%)
No	66 (95.65%)
Infection [N (%)]	
Yes	1 (1.45%)
No	68 (98.55%)

In terms of outcome, the incidence of pain after six weeks of herniotomy was 7 (10.14%). Incidence of recurrence of hernia at six-week follow-up was 3 (4.35%). The incidence of infection after six weeks following herniotomy was 1 (1.45%). This is demonstrated in Table 2 below.

Discussion

"Indirect inguinal hernia" is amongst the commonest surgeries that are performed across the globe, and in the younger population, a consensus is yet to be established regarding the choice of procedure that can be used for repairing the defect causing the hernia, as it can be performed through open or by laparoscopic technique.[11,12] This study primarily aimed to determine the outcomes of an open technique of hernia repair named "herniotomy" while focusing on the young adults suffering from "inguinal hernia".

Pre-operatively, ultrasound was used to assess the hernial sac. This choice was driven by strong evidence from the previous literature in favor of ultrasoundand it has been reported as, which has been reported as the diagnostic modality of choice for this purpose.[13,14] Spinal anesthesia was preferred over general anesthesia. This choice was driven by the relative safety of spinal anesthesia compared with general anesthesia, as reported in prior literature indicating it is a safe alternative to general anesthesia for inguinal hernia repair.[15]

In this study, most of the patients who suffered from "inguinal hernia" were males. This finding of the present study is congruent with the facts reported by previous literature, which states that the prevalence of "inguinal hernia" is manyfold higher in males as compared to females.[16,17] This male predominance is attributed to the unique anatomy of the male inguinal canal, through which testicular descent occurs during fetal development, resulting in a

relatively wider inguinal canal among males.[18,19] In the present study, based on average body mass index (BMI), most patients who had "inguinal hernia" had their BMI in the normal healthy range. This was consistent with findings from a study by Riaz S et al., who reported that most patients with "inguinal hernia" in their study had BMI within the normal range.[20] Contrary to this, there was a widely accepted belief that obese people may be more prone to developing inguinal hernia, but according to recent findings, obesity may result in greater strength and stiffness due to enrichment of collagenous extracellular matrix.[21,22] This may be the reason why patients with hernia of the inguinal range have a normal BMI in this study.

In terms of outcome, only one patient had an infection, seven had pain, and three had recurrences of their hernia at six weeks follow-up, which was quite small. Compared to this, van Kerckhoven G et al. found that the frequency of pain and recurrence among patients who underwent herniotomy were 2.6% and 4.7%, respectively, which were much lower compared to the present study.[8] This difference is highly likely due to a much smaller sample size in the present study. In another study conducted by Ahmad HM et al., found that none of the patients who underwent herniotomy developed infection after surgery, but the frequency of recurrence ranged from 0.8% to 6.2%, which was comparable to the recurrence rate reported in the present study.[23] Similarly, in another large meta-analysis, it was found that repairing "inguinal hernia" without the additional cost of mesh can be a good alternative to "mesh hernia repair" since in this meta-analysis, no difference was observed in terms of pain as well as incidence of recurrence between mesh versus no-mesh hernia repair.[24] In terms of rate of recurrence, incidence reported in the present study in association with "herniotomy" was similar as compared to what has been reported by Beard JH et al.[25]

Based on the findings of the current study, which spanned over a period of two years, the low incidence of post-procedural pain and recurrence at six weeks follow-up indicates that "herniotomy" can be adopted as a safe and cost-effective alternative to "mesh hernia repair" among young adults who suffer from inguinal hernia. Limited sample size, lack of a comparison arm, and study limited to the younger population were a few limitations of the present study.

Conclusion

In conclusion, "herniotomy" can be adopted as a safe and effective treatment for inguinal hernia in the young population due to low incidence of pain (10.14%), recurrence (4.35%), and infection (1.45%) after six weeks of herniotomy, making it a good alternative to mesh repair.

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Author Contributions

MA: Conception, design of the work, and approval for final submission
SMH: Manuscript writing for methodology design, investigation, and approval for final submission
RA: Data acquisition, curation, statistical analysis, and approval for final submission
SB: Validation of data, interpretation, write-up of results, and approval for final submission
AB: Revising, editing, supervising for intellectual content, and approval for final submission
AS: Writing the original draft, proofreading, and approval for final submission
MA is the nominated guarantor and takes full responsibility for the overall content and integrity of the work