ORIGINAL ARTICLE

A COMPARATIVE STUDY OF RATE OF COMPLICATIONS AND RESULTS OF REPAIR OF INGUINAL HERNIA BY DIFFERENT SURGICAL METHODS

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ABSTRACT

Background: Throughout the world inguinal hernia repair is frequently performed surgery in general surgical practice. The aim of this study was to compare rate of complications and results of repair of inguinal hernia by different surgical methods.

Material & Methods: This study was conducted in surgical department of three hospitals; Civil Hospital Naushahro Feroze, JPMC and Dow University Hospital, Ojha Campus, Karachi, from March 2013 to September 2014. In this study, 270 patients of uncomplicated inguinal hernia repair by different methods of repair in the period of one year with follow up from 6 months to two years were taken. According to indications and choice of surgeon different surgical methods were used to repair inguinal hernia and reviewed for best method in terms of recurrence and other complications.

Results: There were no major complications except superficial wound infection (Surgical site infection or SSI) and pain over inguinal region which is comparable to other studies. Recurrence was noted in three patients; two in operated by Stoppa's method and one in TEPP. Post-operative morbidity in form of pain in inguinal region was noticed in 12 patients, out of which 10 were relieved after 6 months to one year; 2 patients were still having pain after 2 years follow-up. Pain was becoming less in severity with time. There were no incidences of mesh rejection or gross wound infection deeper than subcutaneous tissue of abdominal wall.

Conclusion: Different surgical methods used for repair of inguinal hernia have different aspects but all have comparable results but still Lichtenstein's tension-free mesh plasty is gold standard method for inguinal hernia repair.

KEY WORDS: Inguinal hernia; Recurrence; Subcutaneous tissue.

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INTORDUCTION

Inguinal hernia surgery is a surgical operation for the correction of an inguinal hernia which is commonly in practice throughout the world. Surgical correction of inguinal hernias is called a hernia repair. There are various surgical strategies which may be considered in the planning of inguinal hernia repair. These include the consideration of mesh use (e.g. synthetic or biologic), open repair, use of laparoscopy, type of anesthesia (general or local), appropriateness of bilateral repair, etc. Laparascopy is most commonly used for non-emergency cases; however, a minimally invasive open repair may have a lower incidence of post-operative nausea and mesh associated pain. The most commonly performed inguinal hernia repair today is the Lichtenstein repair. A flat mesh is placed on top of the defect.[1] It is a "tension-free" repair that does not put tension on muscles, contrary to Bassini and Shouldice suture repairs (but there are also tension-free suture repairs, like Desarda).[22] It involves the placement of a mesh to strengthen the inguinal region. Patients typically go home within a few hours of surgery, often requiring no medication beyond paracetamol. Patients are encouraged to walk as soon as possible postoper-

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atively, and they can usually resume most normal activities within a week or two of the operation. There are mainly two methods of laparoscopic repair: transabdominal preperitoneal (TAPP) and totally extra-peritoneal (TEP) repair. When performed by a surgeon experienced in hernia repair, laparoscopic repair causes fewer complications than Lichtenstein, particularly less chronic pain. However, if the surgeon is experienced in general laparoscopic surgery but not in the specific subject of laparoscopic hernia surgery, laparoscopic repair is not advised as it causes more recurrence risk than Lichtenstein while also presenting risks of serious complications, as organ injury. Indeed, the TAPP approach needs to go through the abdomen. All that said, many surgeons are moving to laproscopic methodologies as they cause smaller incisions, resulting in less bleeding, less infection, faster recovery, reduced hospitalization, and reduced chronic pain. Complications are frequent (>10%). They include, but are not limited to: foreign-body sensation, chronic pain, ejaculation disorders, mesh migration, mesh folding (meshoma),2 infection, adhesion formation, erosion into intraperitoneal organs.[3] Such complications usually become apparent weeks to years after the initial repair, presenting as abscess, fistula, or bowel obstruction.[3,4,25] In the long term, polypropylene meshes face degradation,[4,5] due to heat effects. This increases the risk of stiffness and chronic pain.[4,5] Persistent inflammation and increased cell turnover at the mesh-tissue interface raised the possibility of cancer transformation.[6] Cases of obstructive azoospermia have been related with the use of polypropylene mesh, due to the obstruction of the vas deferens as a result of the fibroblastic reaction to the mesh.[5,6] However, a recent study finds that this risk seems to be less than 1%[5] and therefore, it does not need to be notified in an informed consent.[6] The aim of this study was to compare the rate of complications and results of repair of inguinal hernia by different surgical methods.

MATERIAL AND METHODS

The cases of inguinal hernia operated between March 2013 and September 2014 and their follow up to April 2015 were reviewed. There were total 270 cases of inguinal hernia and their details are as in Table 1. All patients were admitted for planned surgery; they were investigated and pre-anesthetic done.

They were operated by various procedures according to indications. Out of all 270, 225 case were operated by Lichtenstein's repair, 14 by Prolene Hernia System, 17 by Laparoscopic procedure - Total Extra Pre Peritoneal repair (TEPP), and 14 cases by Stoppa's preperitoneal mesh repair.

Choice of procedure 2 was as follow: young with unilateral inguinal hernia- Lichenstien repair with Prolene mesh, young with bilateral inguinal hernia- TEPP or Bilateral Lichtenstein's repair, Middle and old ages unilateral hernia- Lichtenstein's repair, middle and old ages bilateral hernia- TEPP or Stoppa's repair or Lichtenstein's repair and recurrent inguinal hernia- TEPP or Stoppa's repair. All patients underwent surgery under loco regional, local or general anesthesia as per indications 1. Average duration of surgery for a single repair was 35 minutes except for TEPP, in which the duration was longer about 120 minutes due to learning curve. For Stoppa's repair average operative time was 90 minutes. The choice of anesthesia was as per given in Table 2. Prophylactic antibiotic was given as per SSI class 1; preoperative one dose at the time of induction and postoperative one dose of Ceftriaxone 1 gm per dose as per hospital antibiotic policy. All patients except those who had developed surgical site post-operative wound infection and patients of TEPP and Stoppa's, were discharged on post-operative first day evening after full ambulation and full diet. Those patients operated by TEPP and Stoppa's under general anesthesia were discharged on 3rd post-operative day. Out of 270 patients 137 patients were in follow up for 2 years, 77 were for 1 year and 56 for 6 months.

RESULTS

All patients were males with age range of 18 to 80 years. Except 6 cases of superficial wound infection (Surgical Site Infection or SSI) and 3 cases of recurrence, no major complication was noticed and no mortality was recorded. Post-operative morbidity in the form of pain in the inguinal region was noticed in 12 patients, out of which 10 patients were relieved in 6 months to one year; two patients were still having pain after 2 years of follow-up.

There was no incidence of mesh rejection or gross wound infection deeper than subcutaneous tissue layer of abdominal wall. Testicular atrophy is uncommon but a known complication of hernia repair due to excessive handling and dissection of cord and later thrombosis of testicular vessels, not experienced in our study. There were no anesthesia related or other systematic complications noted. All the patients operated by various methods were reviewed for minor to major complications. No major complication was noted except superficial wound infection and pain over inguinal region over operated site in percentage as given in Table 3 which is comparable to other studies. There was no major difference in the results of surgery, whichever method was used. Recurrence was noted in three patients; two in operated by Stoppa's method and one in TEPP

Table 1: Type of inguinal hernia according to the age group of patients.

Age in years	Frequency	No. of unilateral inguinal hernia	No. of bilateral inguinal hernia	No. of recurrent inguinal hernia
20-35	37	30	7	0
36-50	76	56	20	1
51-65	101	70	31	0
>65	56	31	25	1
Total	270	187	83	2

Table 2: Type of anesthesia for inguinal hernia repair.

Method of repair	Frequency	Local anesthesia	Loco regional anesthesia	General anesthesia
Lichtenstein's	225	28	197	0
TEPP	17	0	0	17
PHS	14	0	14	0
Stoppa's	14	0	0	14
Total	270	28	211	31

Table 3: Rate of complications for inguinal hernia repair.

Complications	Frequency	Relative Frequency
Surgical site infection	6	2.22%
Pain	12	4.44%
Recurrence	3	1.11%

Table 4: Rate of complications stratified for method of surgery for inguinal hernia repair.

Method of surgery	Frequency	Surgical site infection	Recurrence	Pain
Lichtenstein'	225	4(1.48%)	0	6(2.22%)
PHS	14	0	0	3(1.11%)
TEPP	17	0	1(0.37%)	0
Stoppa's	14	2(0.74%)	2(0.74%)	3(1.11%)
Total	270	6(2.22%)	3(1.11%)	12(4.44%)

which were not due to procedure itself but due to inexperience on part of surgeon and less expertise respectively. Overall results were comparable to other studies and literature. Majority of patients was operated by Lichtenstein's repair with good results and less complications.

DISCUSSION

Inguinal hernia is possible to occur more in men than in women for the reason that the spermatic cord passes through the abdominal wall in the inguinal region which increases the chances of hernia formation.[7] Elderly aged cannot be considered as an utter risk factor in the surgical treatment of inguinal hernia, which can also be affirmed for the majority of elderly people pathologies. The modern tension-free techniques have demonstrated in cardio path patients the same advantages which have observed in old age non cardio path patients.[8] The modern tension-free techniques have demonstrated in cardio path patients the same advantages which have observed in old aged non cardio path patients. In our study there were 26% patients in the age ranges of 61-70, 71-80, and >80 years (including 95 years old). They were operated under general anesthesia and managed well postoperatively. There was no mortality in any age group in this series. In our series of 270 patients mean age was 52.65±12.47 years, which is comparable to some local studies. In a local study mean age was 52 years (range 20-75). There were 3% wound infections.[9] The goal of a successful hernia repair include low recurrence rates, permanent relief of pain or discomfort and low incidence of pre and postoperative complications, such as wound

infections and intra-abdominal adhesions.[10] Surgical site infection or wound infection was observed in our study in 4.44% patients. Wound infection was superficial and was managed with antiseptic dressing and antibiotics. No patient required mesh removal for control of infection. Our findings are comparable with a local study in which the incidence of wound infection reported as 5.5%.[11] In few other local studies the incidence of wound infection has been reported from 1% to 4% cases.[12,19] In an international study wound infection was seen 4% in patients of group A and 3.3% in patients of group B.[12] The risk of infection is there but use of antibiotics has overcome this problem. Infection rate in our study was not much more than reported at local and international level. In a national study it has been reported that every where the reasons for these infections could be due to the lack of facilities of proper cleaning and contamination free environment in operation rooms and wards of chronic tertiary care hospitals which is because of overcrowding in hospitals.[9,10] All the infections were superficial incision (surgical site infections) and non progressed to a deep infection. In our study Staphylococcus aureus was the commonest organism found in 3% cases and Escherichia coli was found in 1% cases. Chronic pain is common after primary inguinal hernia repair in young males, but there is no difference in the pain associated with open mesh in and non-mesh repair.[11,12] Postoperative increasing pains were complained by 13% cases of our study which is comparable with other national studies.[13,14] It has been reported in one Pakistani study that the postoperative pain was complained in 10% patients of mesh repair and 7.1% in patients of Bassini's repair.[15,16] In another national study it has been reported that chronic pain was observed in 9% patients at one month and 6% at 6 months for mesh repair post-operatively.[17,18] Wound pain was the most troublesome postoperative discomfort following inguinal hernia repair. A combination of oral opioid analgesic and non-steroidal anti-inflammatory drugs seemed to be satisfactory analgesic agents without noticeable side effects.[19,20] Inguinal hernias regardless of type is one of the most common diseases that a surgeon has to manage.[21,22] Improved surgical techniques and a better understanding of the anatomy and physiology of the inguinal canal have significantly improved outcomes for many patients. Inguinal hernia repair has been evolving for the past 130 years and the pace of evolution accelerated in the last decade with the introduction of the tension free repair, the laparoscopic repair and the growth of the specialist hernia clinic.[23-25]

CONCLUSION

All methods for repair of inguinal hernias have comparable results, but in recent scenario still Lichtenstein's tension free mesh plasty is gold standard method for inguinal hernia repair. Laparoscopic repair (TEPP) requires long learning curve and has potential for serious complications if expertise is not there. PHS is comparable to Lichtenstein's repair in respect of recurrence and complications with added advantage of covering femoral canal with protection against development of or missed femoral hernia.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

Conception and Design:	MJ, MPT, US
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