EARLY OUTCOME OF LICHTENSTEIN TECHNIQUE OF TENSION–FREE OPEN MESH REPAIR FOR INGUINAL HERNIA

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Background: To evaluate the early outcome of Lichtenstein's technique for repair of inguinal hernia using polypropylene mesh. **Methods:** This was a descriptive study conducted over a period of twelve months from 1st July 2007 to 30th June 2008 in Surgical 'B' unit, Lady Reading Hospital, Peshawar. One hundred and twelve patients were received through the out patient department with diagnosis of inguinal hernia. Inclusion criteria was patients above the age of 18 years, reducible hernia, evidence of swelling in groin >2 months. Exclusion criteria was age less than 18 years, chronic constipation, chronic cough, symptoms of prostatism, irreducible hernia, obstructed hernia, strangulated hernia and patients with diabetes mellitus. All the patients were subjected to inguinal mesh repair using the Lichtenstein technique with polypropylene mesh. **Results:** Mean age of patients was 48.78±14.41 years. Sixty patients (53.6%) had right sided inguinal hernia while 46 patients (41.1%) had a left sided hernia and 6 patients (5.4%) had bilateral hernia. Sixty two patients (55.4%) had indirect hernia and 43 (38.4%) cases had direct hernia. Sixteen cases (14.3%) had previous history of surgery for hernia on the same side (recurrent hernia). Mild pain was observed in 53 cases (47.3%), moderate pain in 42 cases (37.5%), and severe pain in 17 cases (15.2%). Four patients (3.6%) in all developed a seroma Two patients (1.8%) developed a haematoma that required drainage. Three patients (2.7%) had a prolonged recovery and presented with abdominal distension. Five cases presented with infected wounds. **Conclusion:** Lichtenstein's technique of inguinal mesh repair is a safe and effective procedure but emerging trends anticipates the implementation of day case surgery.

Keywords: Inguinal hernia, Lichtenstein technique, open mesh repair, hernioplasty, Prosthesis.

INTRODUCTION

Inguinal hernia regardless of type is one of the most common diseases that a surgeon has to manage.[1] 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. From a list of traditional suturing techniques such as Bassini's, Darning, Shouldice and Bassini repairs, in its modified versions is widely still practiced in this part of the world.[2,3]

Traditional suture repair of inguinal hernia is fast giving way to routine tension-free mesh repair. This operation is called a 'hernioplasty'. In many countries, mesh repair is now more common than suture repair.[4] Lichtenstein presented his open mesh repair technique for inguinal hernia in 1986. The Lichtenstein technique has since become the most commonly used[5] (with various modifications) on account of its ease of operation and because it provides a tension-free repair with good long-term results.[6] Tension-free mesh repair is nevertheless associated with complications such as foreign body reaction, infection, pain, fistula formation, migration, shrinkage, and recurrence.[7] Other complications include skin anaesthesia, bruising and haematoma formation, seroma formation, orchitis and testicular atrophy.

The meshes used are typically made from polypropylene or polyester. Other synthetic prosthesis includes Teflon, polytetraflouroethylene (PTFE), light weight propylene and polyester meshes. Various studies have suggested that low density and larger pore size may lead to a decreased inflammatory response and less contracture because it forms a thinner scar net, not a thicker scar plate.[8–10] The decreased inflammatory response may help improve outcomes.[11,12] Investigators have yet to determine the optimal pore size to balance recurrence and inflammatory changes.[13]

In recent years, as in other areas of surgery, laparoscopic repair of inguinal hernia has emerged as an option. Unlike the open method, laparoscopic surgery requires general anaesthesia. It is usually more expensive and consumes more operative time than open repair, carries a higher risk of complications, and has equivalent or higher rates of recurrence compared to the open tension-free repairs.[14] In contrast, failure rates for general surgeons without expertise in hernia surgery, who perform most hernia repairs in secondary or

tertiary level general hospitals, remain significantly higher (up to 10% for primary hernias and 5–35% for recurrent hernias).[15]

The aim of this study was to evaluate the frequency of early postoperative complications using polypropylene mesh in patients undergoing Lichtenstein technique for inguinal mesh repair.

MATERIAL AND METHODS

This was a descriptive study conducted over a period of twelve months from 1st July 2007 to 30th June 2008 in Surgical 'B' unit, Lady Reading Hospital, Peshawar. In this duration 112 patients were received through the out patient department with diagnosis of inguinal hernia. Inclusion criteria was patients above the age of 18 years younger than which there is a general consensus that herniotomy suffices, reducible hernia, evidence of swelling in groin >2 months. Exclusion criteria was age less than 18 years, chronic constipation, chronic cough, symptoms of prostatism, irreducible hernia, obstructed hernia, strangulated hernia, and patients with uncontrolled diabetes mellitus already prone to developing higher rates of infection.

Following admission a detailed history and examination was performed. All patients were investigated for haemoglobin %, blood urea and glucose, chest x-ray. Electrocardiogram was advised for all patients over the age of 45 years. In patients whom incidental findings of derangements of investigations were found, opinion from relative specialties was requested to assess fitness for anaesthesia. Final assessment was confirmed by the attending anaesthetist. A detailed explanation about the participation in the study was given to the patient and a written consent was obtained.

Those regarded as unfit for general anaesthesia were labelled as candidates for the procedure under local anaesthesia. A day before surgery the patients were subjected to clear fluid diet and were advised nil per oral regimen the midnight before surgery day. Over night sedation with oral midazolam was also given in anxious patients.

Following incision the external oblique aponeurosis was cut exposing the inguinal canal and its contents. Then dissection of sac from the spermatic cord and herniotomy was performed leaving entire floor and posterior wall of the inguinal canal exposed fit for placement of a 6×11 Cm Prolene mesh which was trimmed to fit the space, with a slit cut laterally to accommodate the spermatic cord. The mesh lied with the medial edge 1–2 Cm medial to the pubic tubercle. After moving the mesh—with further trimming if necessary—until it lies in the ideal position, it was fixed inferiorly first starting at the medial end with continuous 2/0 prolene suture. Three or four interrupted sutures were used to fix the mesh superiorly. The two tails were then overlapped lateral to the deep ring and secured by two or three interrupted sutures making sure that the cord is not constricted. A suction drain was placed based on the degree of dissection done during the procedure anticipating the formation of a haematoma. Having checked for haemostasis the cord was replaced. The external oblique aponeurosis was then closed by with continuous Vicryl 1.

An intravenous antibiotic was administered intraoperatively in all cases and received further doses on decision by the attending surgeon. The patients were evaluated daily during their stay in the hospital. Analgesics were initially given through the parenteral route and increments done according to the severity of pain analyzed by a visual analogue score. Later oral analgesia was provided as diclofenac sodium (twice daily). Limited mobilization 4–6 hours following surgery was advised. The follow-up schedule was explained to the patient at the time of discharge and was scheduled after one week and then a month later.

A proforma containing relevant demographic data, type of hernia, details of investigation and details of individual operative findings was prepared and recorded. During follow up data regarding the development of complications in the first month postoperatively was recorded. Data collected included duration of hospital stay, pain, ambulation and complications recorded during the operations or the hospital stay and first month postoperatively. Surgical complications were listed as having postoperative pyrexia, pain, seroma formation, haematoma, paralytic ileus, abdominal distension and wound infection. Medical complications were atelectasis, pneumonia, DVT, pulmonary embolism and other anaesthetic complications.

This data was fed and then analyzed on SPSS version 13.0 for descriptive statistics. Variables were expressed as percentages and standard deviation.

RESULTS

A hundred and twelve patients were included in the study. One hundred and eleven patients were male and only one patient was female. Mean age of patients was 48.78±14.41 years. Mean hospital stay was 3.83±1.38 days. These patients were admitted following a mean

duration of 13.74±8.69 months presenting with swelling in inguinal region. Fifty nine patients (52%) also had complaints of pain associated with the swelling. Thirty-two patients (28.6%) were smokers, eighteen patients (16.1%) were those who had quitted smoking and 61 patients (54.5%) were non-smokers. A history of having lifted heavy weights was ascertained in 33 patients (29.5%).

Sixty patients (53.6%) had right sided inguinal hernia while 46 patients (41.1%) had a left sided hernia and 6 patients (5.4%) had bilateral hernia. Those with bilateral hernia were operated for only the side with more symptoms and were given a latter date to follow for surgery on the contra lateral side. Sixty two patients (55.4%) were diagnosed peroperatively with indirect hernia. On the contrary 43 patients (38.4%) had a direct hernia and 7 patients (6.3%) had a pantaloon hernia. Amongst all operated cases 16 cases (14.3%) were recurrent meaning they had some other form of repair on the same time earlier only to await reappearance of the swelling some months later.

Table-1: Data of Demographic variables and symptoms presenting preoperatively (n=112)

No. of Patients	112
M:F	111:1
Mean age (yrs) (Mean±SD)	48.78±14.41
Mean Stay (days) (Mean±SD)	3.83±1.38
History of smoking	
Non Smoker	61(54.5%)
Smoker:	32 (28.6%)
Quitted Smoker	8(16.1%)
Heavy weights lifted	33 (29.5%)
Pain associated	59 (52%)
Duration of swelling (months) (Mean±SD)	13.74±8.69

Table-2: Per-Operative findings (n=112)

Side Of hernia	Right	60 (53.6%)
	Left	46 (41.1%)
	Bilateral	6 (5.4%)
Type of hernia	Direct	43 (38.4%)
	Indirect	62 (55.4%)
	Pantaloon	7 (6.3%)
Recurrent cases	Non Recurrent	96 (85.7%)
	Recurrent	16 (14.3%)

The operative time was of a mean of 43.98±9.46 minutes. Amongst 112 patients only 3 patients in all underwent the procedure using local anaesthesia as they were regarded unfit during the preoperative assessment. In 69 cases (61.6%) a suction drain was placed before approximation of the external oblique aponeurosis.

For the data collected in the postoperative duration 19 patients (17%) had postoperative pyrexia. Using the visual analogue score patients were categorized having mild pain in 53 cases (47.3%), moderate pain in 42 cases (37.5%) and severe pain in 17 cases (15.2%). Oral feeding was resumed following a mean duration of 8.62 hours in those that underwent the procedure following the use of general anaesthesia. Four patients (3.6%) in all developed a seroma amongst which three required no drainage and settled. Two patients (1.8%) developed a haematoma that required drainage and haemostasis was secured. Three patients (2.7%) had a prolonged recovery and presented with abdominal distension but settled on a nil per oral regimen. Five cases presented with infected wounds with infection of mesh that required debridement.

Table-3: Post operative data and frequency of complications (n=112)

Postoperative Oral Feed ± SD (hours)	8.62±5.89
Post operative pyrexia	19 (17%)
Seroma formation	4 (3.6%)
Haematoma formation	2 (1.8%)
Abdominal distension	3 (2.7%)
Wound Infection	5 (4.5%)
Post Operative Pain	
Mild pain 0–30 mm	53 (47.3%)
Moderate pain 31–60 mm	42 (37.5%)
Severe pain 61–90 mm	17 (15.2%)
Excruciating pain 91–100 mm	0 (0%)

All 112 patients presented in the follow up period till the first month. In the post operative period all these complications were kept to mind and noted. There was a special mark to the cosmetic outcome by measuring the length of the scar at follow up of first month. The mean length of the scar was 7.62±1.101 Cm.

DISCUSSION

Not included in this study, a significant proportion of our patients come late with complete hernia, which are bigger and have wider defects than simple inguinal hernia.[16] Hence the need to reinforce the posterior wall with a repair is deemed mandatory. In the light of discussion mesh repair truly is an obvious improvement in repair of inguinal hernia. In an attempt to reduce the incidence of recurrence following the repair of inguinal hernia, various techniques have been used. Including autologous tissue techniques and a variety of biomaterials.[17,18] Lichtenstein technique and its modifications have become some of the most popular and frequently performed surgeries.[19] It is a simple, operator-friendly technique that is easy to learn and perform. The incidence of perioperarive and postoperative complications is minimal. Most of the patients

return to routine life within 48 hours and 60% of physical labourers return to work within 4 weeks.

Yet there is a high incidence of chronic groin pain following hernia repair.[20] and chronic groin sepsis after mesh repair requires complete removal of mesh to treat the sepsis.[21] Possible damage to the spermatic cord and nerve entrapment following mesh repair due to extensive fibrosis are also concerns raised by this technique.[22] Depending on the level of expertise and the degree of handling the incidence of post operative pain is greatly altered. Yet the results from a study conducted by Danielson *et al*[23] amongst a list of open repairs Lictenstein's requires lesser expertise with a less steep learning curve.

The mean age in our study is 48.78 years (S.D±14.41) which is comparable to studies in the west[24] but strongly contradicts African studies[16]. The side of inguinal hernia was dominantly found per-operatively on the right side in 60 patients (53.6%). Where as the type of hernia was predominantly of the indirect type; 62 patients (55.4%) comparable to the study conducted by Usoro *et al*.[16]

Results of the present study took into account the early complications of surgery following the Lichtenstein technique. Yet no open procedure is exempt from the complications enlisted in the current study.[5] In the postoperative six patients in all presented with scrotal swelling of which 4 patients (3.6%) had developed seroma and two patients (1.8%) had haematomas formed. This was comparable to a study by Desarda *et al*.[26] These complications require drainage which is another procedure requiring follow up and anticipation of other complications such as infection.[27]

During the first month following surgery 5 patents (4.5%) presented with wound infection. Septic complications of the prosthesis have been reported by various studies to occur in 0.2–0.8% of patients.[28,29] In these cases, apart from antibiotic therapy, puncture and drainage of these infected collections under ultrasound control have been described although in most cases prosthesis removal is inevitable.

Considering the length of stay that was 3.83 days in the present study and the evolving trends to the application of these procedures as day-cases, there are reasons to perform the procedure in routine under local anaesthesia. This duration includes the preoperative phase of preparation till discharge and is deemed inevitable considering this series of surgery being conducted under general anaesthesia. Other limitations include its non-availability in every part of the world, it increases the cost of the operation and because the groin is a mobile area there is a tendency for the mesh to fold, wrinkle or curl.[30]

Some studies reported chronic groin pain following open mesh repair in 28.7 % to 43.3%.[31] During the acute phase 53 patients (47.3%) required only reassurance with oral analgesia, 42 patients (37.5%) required further increments in doses with parenteral analgesia and 17 other patients with more severe pain needed parenteral analgesia but majority settled during hospital admission. Wound pain was the most troublesome postoperative discomfort following inguinal hernia repair. A combination of oral opioid analgesic and non-steroidal anti-inflammatory drug seemed to be satisfactory analgesic agents without noticeable side effects.[32]

The cost of meshes needs to be considered, and a larger sample size and further studies are needed for a more objective comparison of outcome between mesh repair and traditional suture repair in our environment.

CONCLUSIONS

The early results of Lichtenstein technique are encouraging with regards to safety and effectiveness. Success of day surgery relies on careful patient selection, skilful operative techniques, safe anaesthesia, and adequate postoperative care and the need for implementation of ambulatory surgery service is anticipated.

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