Comparative Study of Postoperative Complications of Lichtenstein Tension Free Repair and Pure Tissue Repairs Like Modified Bassini or Shouldice at Nishtar Hospital Multan

M AZIZ N AHMAD F ANWAR *FAIZULLAH*
Department of Surgery, Nishtar Hospital/Nishtar Medical College, Multan
Correspondence to Dr. Muzaffar Aziz, drmuzaffaraziz@yahoo.com

The objective of this study is to compare the postoperative complications of Lichtenstein tension free repair and pure tissue repairs like modified Bassini or Shouldice. This was an interventional (quasi experimental) study. This study was carried out on 100 patients having primary inguinal hernia. After taking detail history, examination and necessary investigations, only fit patients were included in the study and rest were excluded. A separate file was maintained for each patient to note the complication rate of different hernia's repairs. Patients in group I underwent modified Bassini (35%) and Shouldice repair (15%). Patients in group II underwent Lichtenstein repair (50%).30 (30%) complications were observed. Out of these 23(23%) were in group I and 7(7%) were in group II. All were managed conservatively. The main complications were wound hematoma (9%), Wound infection (3%), scrotal edema (1%), postoperative neuralgia (6%), retention of urine (8%) and recurrence (3%). Wound infection, wound hematoma and recurrence were seen more in group I. Post operative neuralgia was more common in group II. Although follow up was for a shorter period of time and complications like recurrence and post operative neuralgia could not be assessed accurately. It was concluded that Lichtenstein tension free repair is simple and effective method of repairing inguinal hernia, with low complication rates and low recurrence rate. The method is much easier and should be considered in majority of patients with inguinal hernia.
Key words: Bassini repair, Shouldice repair, Lichtenstein repair.

Inguinal hernia is a common problem. All age groups are affected.[1] Peak incidence is in first and third decade of life, males are affected more as compared to females and is more common on right side.[1] Inguinal hernia repair is the most frequently performed operation in general surgery.[3] The number of times it is performed each year is approximately 80,000 in UK, [4] 100,000 in France[5] and 700,000 in USA[3].

In 1889 Bassini published his paper on the treatment of groin hernia, since then many modifications and alternatives to Bassini repair have been suggested.[6] These include Marcy, MacVay, Halsted I, Halsted II, Ferguson and Shouldice repair. All of these repairs have suture lines under tension because the defect edges are approximated instead of being supported by prosthesis. Annual statistics from various countries showed that 10–15% of inguinal hernia operations are for recurrent hernias[7] and the rate of relapse in conventional methods of herniorhaphy averages 8%.

The surgical treatment of inguinal hernia has changed over a relatively short period in terms of operating techniques like widespread use of prosthetic mesh. The term tension free hernioplasty was used by Lichtenstein sixteen years ago[9]. In 1989 Lichtenstein et al published a study of 1000 cases of inguinal hernia operated with the implantation of a prosthetic mesh to perform tension free hernioplasty. The method was reported to produce no recurrence, no infection and two patients developed haematoma/seroma per 1000 cases.[10] The operation is simple to perform, gives excellent early results with low complication rates and an early return to full activity[8]. Lichtenstein repair is simple and effective method of repairing inguinal hernia and is particularly suitable for recurrent and large bilateral direct hernias.[2, 11]

Material and methods

This is an interventional (quasi experimental) study of hundred patients of primary inguinal hernia admitted in the Surgical Unit IV, Nishtar Hospital, Multan.

Inclusion criteria

All the patients with primary inguinal hernia admitted in Surgical Unit IV were included in the study.

Exclusion criteria

Following patients were excluded from the study:

- Presence of serious cardiac and respiratory illness.
- With strangulated and obstructed inguinal hernia.
- Urinary obstruction due to large prostate.
- Patients refusal to come for follow up

Data collection

This study was carried out in Surgical Unit IV of Nishtar Hospital, Multan over a period of two years from January 2001 to December 2002. Seventy patients were admitted in the ward through Outpatient Department and thirty from the emergency department after the reduction of hernia. All patients were operated on planned list. A detailed history and thorough physical examination was carried out in each case. Only patients with fully reducible hernias were included in the study. Patients were selected at random. Equal number of patients were allotted to each of the two groups i.e. 1. Mesh repair, 2. Pure tissue repair. Preoperative work up of the patients with complete blood examination, complete urine examination and blood sugar

was done. ECG and chest X-ray of the patient 45 years and above was done and their cardio- respiratory status was assessed. P/R examination and ultrasound of the prostate was done to assess the urinary status of patients above 50 years of age. All the data was recorded on the pre designed Performa. All patients received three perioperative shots of first generation cephalosporin.

All operations were performed under spinal anesthesia. All members of the staff operated on the randomized patients. The hernias were classified according to its anatomical position as direct or indirect. Data about operative and postoperative complications was recorded.

Haematoma was defined as collection of blood in the surgical wound. Pain in the groin or scrotum, which lasted longer than one month after the operation was recorded as a complication. A recurrence was described as a clinically detected reducible swelling in the groin.

The patients were seen in the outpatient department one week post operatively to detect possible wound complications and then 3, 6 months post operatively.

Data analysis:

The hypothesis was tested by student's t-test. A p value of <0.05% was considered significant. Percentages, means were calculated. All calculations were done by SPSS version 10.0.

Results

A total of 100 patients were divided into two groups. Group I (n=50) underwent pure tissue repairs like modified Bassini repair (n= 35) and Shouldice repair (n=15). Group II patients had Lichtenstein mesh repair (n= 50).

The age of the patients ranges from 18 to 70 years (mean 46 years) (Table 1). All were male. The frequency of the type of hernia was first diagnosed clinically and finally confirmed during operation. 64 patients (64%) had indirect inguinal hernia, 30 (30%) had direct inguinal hernia and 6 patients (6%) had both direct and indirect inguinal hernia. Fifty six patients (56%) had right sided inguinal hernia, forty patients (40%) had left sided inguinal hernia and 4 patients (4%) had bilateral inguinal hernia.

The commonest mode of presentation was swelling in the groin 100%, dragging pain in the groin during walking 43%, irreducibility 27%. On physical examination positive cough impulse was present in 74% (Table 2).

The prosthetic material used in all cases was polypropylene mesh.

In Group I, 15 patients (15%) underwent Shouldice repair and 35 patients (35%) underwent modified Bassini repair. In Group II, 50 patients (50%) had Lichtenstein mesh repair. There was no major intra operative complication or postoperative death in either group. 30(30%) complications were observed (Table 3). Out of these 23(23%) were in group I and 7(7%) were in group II. All were managed conservatively.

The main complications were wound haematoma in 9 patients (9%). Wound infection in 3 patients (3%), scrotal edema in one patient (1%), postoperative neuralgia in 6 patients (6%), retention of urine in 8 patients (8%) and recurrence in 3 patients (3%). These patients were asked for regular follow up. The mean follow up was 9.5(1-18 months). Overall recurrence was seen in 3 patients (3%) and all were in group I (Table 4).

There was significant difference between post operative complications in two groups. As scrotal edema (2% vs 0%, $p<0.05\%$), wound infection (6% vs 0%, $p<0.05\%$), wound haematoma (14%vs4%, $p<0.05\%$) and recurrence (6% vs 0%, $p<0.05\%$) was seen more in group I. However, post operative neuralgia was more common in group II. There was no occurrence of deep mesh infection in patients with mesh repairs.

Table 1. Age of patients

Age in years	Frequency	%age
10 – 20	5	5
21 – 30	11	11
31 – 40	17	17
41 – 50	37	37
51 – 60	19	19
61 – 70	11	11
Total	100	100

Table 2. Clinical presentation

	Present	Absent	%age
Swelling	100	0	100
Irreducibility	27	73	27
Groin pain	43	57	43
Cough impulse	74	26	74

Table 3. Postoperative complications

Complication	Present	%age
Haematoma	9	9
Wound infection	3	3
Retention of urine	8	8
Scrotal edema	1	1
Mesh infection	0	0
Recurrence	3	3
Post operative neuralgia	6	6

Table 4 Comparison of postoperative complications (n=100)

Complications	Group 1	%	Group 2	%
Haematoma	7	14	2	4
Wound infection	3	6	0	0
Retention of urine	6	12	2	4
Scrotal edema	1	2	0	0
Mesh infection	-	-	0	0
Recurrence	3	6	0	0
Postop neuralgia	3	6	3	6

Discussion

Inguinal hernia is commonest amongst all external hernias[12]. Operation of inguinal hernias is one of the most common operations in general surgery[13]. Inguinal hernia is repaired with different techniques. These include Shouldice repair, Lichtenstein repair, modified Bassini repair, Darn repair, Plug and Patch repair.

Many factors influence the outcome of operation performed by the surgeon. Detailed anatomical knowledge of the inguinal region, standard operative technique and careful preparation of the patient reduces the complication to a low level. These criteria are the same for all operative methods.

Lichtenstein introduced the mesh repair of inguinal hernia in 1964[10]. With the use of modern mesh prosthesis it is now possible to repair inguinal hernia with out distortion of normal anatomy and with no suture line tension. The incidence of complications and recurrence is lower in Lichtenstein repair as compared to conventional repair, therefore it is recommended for recurrent as well as for primary repair[14]. In contrast with Bassini repair this technique has gained little acceptance in our country. Modern mesh is strong, monofilament, inert and readily available. It is very thin and porous. Its interstices become completely infiltrated by fibroblast and remain strong permanently[15].

All age groups are affected.[1] However this study shows peak occurrence in fifth decade. A study by Lodhi FB showed peak occurrence in first and third decade of life[1].

Inguinal hernias are many times more common in males. However in this study all were male patients as in some other studies by Baluch and Ahmed S[16, 2].

In this study 56% patients had right sided inguinal hernia, 40% patients had left sided inguinal hernia and 4% patients had bilateral hernia. The increased occurrence of right sided inguinal hernia is also reported in other studies.[1, 16, 14] In a study done by Adesunkanmi PR hernia was the commonest on right side 49.6% and bilateral in 15.2%[17,7].

In our study the inguinal hernia was indirect in 64% and direct in 30% of cases. Baluch reported indirect inguinal hernia in 80% of cases and direct hernia in 20% of cases.[16] Mahmood T has reported indirect inguinal hernia in 85% patients and direct in 15% patients[18].

A study done by Forte A showed that prosthetic repair of inguinal hernia is more effective than "conventional" (Bassini, Mc Vay, Shouldice). The complications reported were: urine retention (1.6%), superficial haematoma (1.3%), superficial infection (1%), wound suppuration (0.5%), serous effusion (0.7%), post surgery pain (2.1%), scrotal edema (1.7%), persistent inguinal neuralgia (0.6), local hypoesthesia (4.3%), ischemic orchitis (0.1%), and recurrence (0.2%)[19].

Wound infection was found in 3% of our cases which is quite low as compared to other local studies like 4% by Leghari AZ and Jamal A [20] and 3.3% by Lodhi F B.[1] The reason for low infection rate in our study is the judicial role of prophylactic antibiotic and particular attention given to sterilization. In another study Ahmed S reported 0% wound infection[2].

Friis E reported an infection rate of 2.7% of the operation, but in no case mesh has to be removed[21]. Bhopal FG in his study, reported an infection rate of 1.9% to 7.5%[22].

In our study scrotal haematoma was found in 9% of cases. All of them were treated conservatively. None of them required aspiration or drainage. Postoperative scrotal hematoma was seen more commonly in cases of Bassini repair as dissection leads to more chances of damage to the pampiniform plexus[23]. And more tension on suture line in Bassini causes temporary obstruction of venous and lymphatic outflow at deep ring. This leads to more scrotal edema, stasis, infection and therefore, increases incidence of orchitis[24]. Study by Lodhi FB[1] showed scrotal haematoma in 8.3% of cases and 3% by Ahmed S[2].

A study by Mokete and Earnshaw showed haematoma in 1.4% of cases as the commonest complication[8]. Another study done by Adesunkanmi PR reported scrotal haematoma/edema in 16.4% patients, wound infection in 14.4% and recurrence of hernia in 2.8% of cases[17].

As all our patients received spinal anesthesia, 8% of the patients developed urinary retention requiring catheterization. The increased incidence of postoperative pain also raises the chances of urinary retention[25]. Lodhi F B reported urinary retention in 6.6% of cases.

There was no case of deep mesh infection requiring mesh removal in our study. Other studies like Ahmed S also reported 0% incidence of deep mesh infection. Mortality was 0%. Recurrence in our study was in 3% of cases and both these patients had modified Bassini repair.

Bhatti AZ and Rasool I M reported that postoperative complications like scrotal hematoma, wound sepsis, testicular atrophy, urinary retention and orchitis were seen more in Bassini group[26].

A study by Schoots IG suggest that the Shouldice and Lichtenstein repairs may be superior to the Bassini repair in terms of early hernia recurrence[27]. A study by Ahmed S, [2] Bhopal [16] and khan AZ reported zero rec[28].

Another study by Nordin P showed recurrence rate of 4.7% after Shouldice repair and <1% after Lichtenstein repair with an overall follow up of 3-6 years[29]. Virijland in his study showed 7% recurrence rate for non mesh methods of inguinal hernia repair and 1% for mesh repair.[30] Another study done by Buononato M reported 0.75% recurrence rate after tension free mesh repair[31].

A study by Mokete and Earnshaw showed recurrence rate of 4% after Bassini operation and <1% after Lichtenstein operation. A study by Miyazaki K showed recurrence rate of 7.6% after Bassini repair and 0.9% after mesh repair[32].

In our study postoperative neuralgia was seen in 6% of cases. Neuralgia can be caused by stretching, nicking, transecting, or suturing the iliohypogastric, ilioinguinal, or genitofemoral nerves. The nerve may be entrapped in scar tissue within the inguinal canal. In study by Nordin P chronic groin pain was reported in 4.2% and 5.6% of cases in Lichtenstein and Shouldice group respectively[29].

advantage includes rapid wound healing and avoids keyhole deformity created by midline sphincterotomy. Recurrence is usually less than 10%, and minor incontinence such as leakage of mucus and gas is reported in less than 10 %[5].

Table I Complications observed in patients undergoing LIS and AD (n=30)

Symptoms	Lateral Sphincterotomy	Anal dilatation
Postop pain		
a). pain intensity	Injectable analgesia required for 24hrs	Injectable analgesia required for 3 days
b). duration of pain	Oral analgesia required for 2-3days First 1-2 days	Oral analgesia required for 7-10 days Painful defecation for 4-7 days
Bleeding P/R	Stopped after first 2 defecations	Took 5-7 days on an average to stop.
Swelling	No swelling in perianal region	Perianal haematomas & swelling seen in 15 patients (50%)
Anal incontinence	Grade 2 incontinence seen in two patients (6.6%)	Grade 3 incontinence seen in 5 patients (16.6%) Grade 2 incontinence seen in 13 patients (43%)
Prolapse	Haemorrhoidal prolapse observed only in 3 patients (10%)	Haemorrhoidal prolapse seen in 12 patients (40%) Rectal prolapse seen in 2 patients (6.6%)
Recurrence of fissure	No recurrence seen	Recurrence seen in 2 patients (6.6%)

Our study aims at a comparison between LIS and AD as a treatment modality of fissure in ano whether acute or chronic. The results were suggestive that LIS is a far superior procedure than AD and should be strongly recommended in all uncomplicated fissures. Enhanced morbidity following the AD can be explained by the pathogenesis which follows the procedures. In AD the strength of dilatation is operator dependant, uncontrolled and not standardized, therefore irregular tearing takes place at multiple sites in the sphincter. This also leads to tearing of fibers of external sphincter and hence the incidence of postoperative pain, swelling and incontinence is observed more in AD. Whereas in LIS one is only dividing the internal sphincter at one site by a standardized method particularly that sphincter is responsible for painful spasm in FIA[6]. The external sphincter and the puborectalis muscles are primarily responsible for voluntary control whereas internal sphincter maintains continence at rest. Therefore the incision of the distal third of the internal sphincter does not affect the continence

Conclusions:

The LIS is the procedure of choice for most surgeons. A success rate of 90-95 percent is reported after LIS for acute or chronic fissure in ano. Our study had confirmed that LIS should be adopted as procedure of choice for an uncomplicated fissure in ano. AD should not be performed as it is associated with high morbidity and complications.

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