ORIGINAL ARTICLE

Early Outcome of Lichtenstein Technique for Inguinal Hernia Repair in Tertiary Care Hospital

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ABSTRACT

Background: Inguinal hernia repair are very common in day to day general surgical practice. Results of surgical repair are often satisfactory but recurrences following surgery is troublesome both for surgeon and patient. Lichtenstein technique is now the most widely performed technique in groin hernia repair. The aim of this study was to assess short term outcome of inguinal hernia repair by Lichtenstein technique.

Methods and materials: In this prospective study, 30 inguinal hernia repairs were performed by Lichtenstein technique between January 2015 and December 2017 in surgery department of Holy Family Red Crescent Medical College Hospital. Patients were scheduled for follow up visits at 1st week, three months and six months in out- patient department. The main outcome measure was early recurrence, groin pain and other complications.

Results: In this study age of the patients ranged from 30 years to 78 years, The mean age was 51.93 (±SD 10.12) years. Regarding personal habit, more than half of the patients of inguinal hernia were found to be non-smoker and about 37% of the patients were current smokers. Most of the hernia were of indirect type (18/30) followed by direct type (9/30). In indirect type 55.6% of the hernias were in the right side and the rest were in left side. On an average each operation lasted for 1.18 hours and oral feeding started 12.69 hours after the operation. Two patients (6.7%) had a prolonged recovery and presented with abdominal distention after operation. Postoperative hospital stay that was 2.27 days. 6 (20%) patients developed postoperative urinary retention. Scrotal haematoma formation was observed in 5(17%) cases and local haematoma or seroma formation in incision site was reported in 4 (13%) cases. In 6 patients (20%) we used suction drain tube at tissue plane where mesh was placed for draining of blood or seroma and that drain tube was removed 2nd or 3rd postoperative period. Periincisional skin echymosis, abdominal distension and superficial wound infection, postoperative pyrexia were the other complications reported. No recurrence or mesh rejection or mesh infection were observed within short time postoperative follow up period.

Conclusion: Lichtenstein technique is easy to learn, simple to perform and very rationale to perform and recurrence rate is low. Multi-centre studies with larger sample and longer duration of study and more sound study design could bring more insight regarding this issue.

Key Words: Inguinal hernia, Lichtenstein technique, recurrence.

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Introduction

Inguinal hernia regardless of type is one of the most common diseases that a surgeon has to manage[1-6]. 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 evaluation accelerated in the last decade with the introduction of the tension-free repair, the laparoscopic repair and the development of the specialist hernia clinic[5-10]. From a list of traditional suturing techniques such as Bassini's, Darning, Shouldice and Bassini's repair & its modified versions is widely still practiced in the world[3,11-13].

Traditional suture repair of inguinal hernia is fast giving way to routine tension- free mesh repair. This operation is called hernioplasty[2,7]. In many countries, mesh repair is now more common than suture repair. Lichtenstein presented his open mesh repair technique for inguinal hernia in 1986[2]. This technique has since become the most commonly used (with various modifications) on account of its ease of operation and because it provides a tension-free repair with good long-term results[3,4]. This tension-free mesh repair is nevertheless associated with complications such as foreign body reaction, infection, pain, sinus formation, migration of mesh and recurrence of hernia. Other complications include haematoma formation and seroma formation specially in complete variety of inguinal hnernia, orchitis and testicular atrophy etc.[4,7]. The meshes used are typically made from polypropylene or polyester. Other synthetic prosthesis includes Teflon, Polytetraflouroethylene (PTFE), light weight propylene and polyester meshes[2,5].

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[1,5]. 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 repair.[3,5]

Inguinal hernia usually develop in long standing untreated cases and sometimes treatment by surgery is very challenging for surgeons[2,5,6,8,11]. In complete variety of inguinal hernia as there is more tissue dissection and sometimes hernial sac is removed during surgery[4,6,7,8,13]. So there is more chance of seroma formation and subsequently more chance of mesh related complications[3,4,5,6]. Sometimes, drain placement is required to drain seroma or blood. In complete variety as hernial sac is sometimes large and as gut is herniated many times, so there is more chance of delayed return of normal bowel function and delay in postoperative recovery. And there is also very few data worldwide regarding Lichtenstein procedure in treating complete variety of inguinal hernia.

Materials and Methods

we performed these operations in Surgery department of Holy Family Red Crescent Medical College Hospital, Dhaka on 30 patients having inguinal hernia in the period from January, 2015 to December, 2017. Inclusion criteria was patients age more than 18 years, clinically diagnosed as a case of complete variety of inguinal hernia who willingly gave informed consent to take part in this study. Exclusion criteria were age-less than18 years, patients having chronic cough, chronic constipation, having strangulated hernia, obstructed hernia, irreducible hernia, patients having uncontrolled Diabetes Mellitus, having psychiatric problems and pregnant woman.

Following admission a detailed history and examination was performed. All patients were investigated for Haemoglobin %, blood urea, serum creatinine, blood 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.

A day before surgery the patients were subjected to clear fluid diet and were advised nil per oral regimen the midnight before surgery day. Overnight

sedation with oral midazolam was also given in anxious patients. Most of the operations were done under spinal anaesthesia and few were done under epidural anaesthesia.

Following incision the external oblique aponeurosis was cut exposing the inguinal canal and its contents. In complete variety inguinal hernia sac extends up to bottom of scrotum. After dissection of the sac from spermatic cord, it was divided transversely at inguinal canal, then hernia contents were reduced in abdominal cavity, then proximal part of sac was cleared up to its neck and after trans fixation of neck of the sac, herniotomy was performed in all cases leaving entire floor and posterior wall of the inguinal canal exposed fit for placement of a 7×11 cm prolene mesh which was trimmed to fit the space with a slit cut laterally to accommodate the spermatic cord. In all cases distal part of sac was left untouched and dropped back except part of the sac which was adherned to hernia contents where partially dissected to clear the adhesions. Unnecessary distal part of sac dissection was avoided to reduce postoperative haematoma formation. During dissection, ilio-inguinal, genital branch of genitofemoral nerve were preserved. The mesh lied with the medial edge 1-2 cm medial to the pubic rubercle. After moving the mesh, with futther trimming if necessary, until it lies in the ideal positon, it was fixed inferiorly first starting at the medial end with interrupted simple 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 surtues making sure that the cord is not constricted. In some cases suction drain was placed based on the degree of dissection done during the procedure anticipating the formation of seroma or haematoma. Having checked for haemostasis the cord was replaced. The external oblique aponeurosis was then closed with continuous Vicryl 2/0.

An intravenous antibiotic inj. Cefuroxime (1.5 mg) was administered intraoperatively in all cases, then 750 mg 8 hourly for 24 hours followed by oral form of cefuroxime (400 mg) 12 hourly for next 5 days. The patients were evaluated daily during their stay in hospital. Analgesics were initially given through the parenteral route (Inj.pethedine, 1 mg/kg body weight,8 hourly for first 24 hours) and then per orally (Tab. Ketorolac,10 mg, 8 hourly for next 4 days) and severity of pain was analyzed by a visual analogue score. Limited mobilization upto 24 hours following surgery was advised. The follow up schedule was explained to all patients at the time of discharge and was scheduled after one week and then 12 weeks 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 postoperatively were recorded. For analysis of data SPSS for Windows (IBM SPSS Statistics for Windows, version 17.0, Armonk, NY: IBM Corp.) software was used. All the data were recorded systematically. Collected data were compiled and tabulated on a master sheet.

Thirty patients were included in the study. Age of the patients ranged from 30 years to 78 years, The mean age was 51.93 (±SD 10.12) years and 70% of the patients were between 40 to 60 years of age. Regarding personal habit, half of the patients of inguinal hernia were found to be non-smoker and about 37% of the patients were current smokers. Leading profession was cultivation (37%), while more than 23% the patients were servicemen. It may be noted that only 7 (23%) were involved in the act of heavy weight lifting.

Table III: Types of hernia by side

Type of Hernia	Side of Hernia			Total
	Right	Left	Bilateral	
Direct (n, %)	5 (55.6)	1 (11.1)	3 (33.3)	9 (100.0)
Indirect (n, %)	10 (55.6)	8 (44.4)	0 (.0)	18 (100.0)
Pantaloon (n, %)	1 (33.3)	1 (33.3)	1 (33.3)	3 (100.0)
Total (n, %)	16 (53.3)	10 (33.3)	4 (13.3)	30 (100.0)

Most of the hernia were of indirect type (18/30) followed by direct type (9/30). Pantaloon variety

found only in three patients. over 99% patients were operated on under local anesthesia. Mean duration of swelling of hernia was 8.90 (±3.25) years. On an average each operation lasted for 1.18 hours. In this study on an average oral feeding started 12.69 hours after the operation. 2 patients (6.7%) had a prolonged recovery and presented with abdominal distention after operation but settled on a nill per oral regimen. average length of postoperative hospital stay that was 2.27 days. 6 (20%) patients developed postoperative urinary retention. 3 cases urinary retention was relieved by reassurance, hot compression in perineal region or bladder stimulation with the sound of running tape water and in 3 cases urethral catheterization done to relieve urinary retention. In 4 cases scrotal haematoma or seroma and urinary retention both complications coexist.

Table IV: Postoperative complications

Complications	Frequency	Percent
Postoperative urinary retention	6	20.0
Scrortal haematoma formation	5	16.7
Local haematoma or seroma formation	4	13.3
Periincisional skin echymosis	3	10
Abdominal distension	2	6.7
Superficial wound infection	2	6.7
Pyrexia	2	6.7

Post Operative Pain in 24 hours

Mild pain	0-30 mm	13	43.3
Moderate pain	31-60 mm	12	40
Severe pain	61-90 mm	5	16.6
Excruciating pain	91-100 mm	0	0

scrotal haematoma formation was observed in 5(17%)cases and local haematoma or seroma formation in incision site was reported in 4 (13%) cases. In 6 patients (20%) we used suction drain tube at tissue plane where mesh was placed for draining of blood or seroma and that drain tube was removed 2nd or 3rd postoperative period.

Table V: Some important continuous variables showing minimum value, maximum value, mean and SD

Descriptive statistics	Minimum	Maximum	Mean Std.	Deviation (SD)
Duration of swelling (years)	5	16	8.90	3.25
Total operation time (hours)	0.75	3.00	1.18	1.158
Starting of oral feeding (hours)	6.00	48.00	12.69	11.49
Total estimated cost (BDT)	12000.00	25000.00	15000.00*	3580.92
Postoperative hospital stay (days)	1.00	4.00	2.27	0.78

* Median value

Using Visual analogue score patients were categorized having mild pain in 13 cases (43.3%), moderate pain in 12 cases (40%) and severe pain in 5 cases (16.6%) after 1st 24 hours of operation. Periincisional skin echymosis, abdominal distension and superficial wound infection, postoperative

Table VII: Follow up findings

Follow-up	Complaints	n (%)	Measures taken	Outcome
Within 1 st week	Wound infection	2 (6.7)	Dressing plus Antibiotic	Wound healed
	Urinary retention	6 (20)	In 3 cases retention was relieved by conservative measure and in 3 cases catheterization done	
	Abdominal distension	2(6.7)	Nil per oral regimen	Resolved
	Pyrexia	2 (6.7)	Antipyretic.	Resolved
	Periincisional skin echymosis	3(10)	Conservatively treated.	Resolved
	Scrotal haematoma	3 (10.0)	In 2 cases wide bore needle aspiration done and other 1 cases are conservatively treated.	Resolved Resolved
	Local seroma or haematoma	2 (6.7)	wide bore needle aspiration done.	Resolved
After 3 months	Groin pain	3 (10.0)	Analgesic.	Resolved
	Wound pain	1 (3.3)	Analgesic plus Anxiolytic.	Resolved
	Discharging sinus	0		

pyrexia were the other complications reported. No recurrence or mesh rejection or mesh infection were observed over six months follow up.

Discussion

Inguinal hernia repair is one of the oldest operations ever documented in the history of Surgery[25]. A lot of studies have described the historical basis for the use of mesh[25-27]. In the present study age of the patients ranged from 30 years to 78 years, The mean age was 51.93 (±SD 10.12) years and 70% of the patients were between 40 to 60 years of age, the most active part of ones life where sound repair of hernias and prevention of recurrence is of great importance. Masum M15 reported 55% were 31 to 40 years. Khan N16 reported mean age was 42.78 years in their study which were lower than this study.

Regarding personal habit, half of the patients of inguinal hernia were found to be non-smoker and about 37% of the patients were current smokers. Leading profession was cultivation (37%), while more than 23% the patients were servicemen. It may be noted that only 7 (23%) were involved in the act of heavy weight lifting. In some literatures the causal relationship between weight lifting and occurrence of inguinal hernia were reported. Most of the hernia were of indirect type (18/30) followed by direct type (9/30). Pantaloon variety found only in three patients. In direct type more than half were in the right side and one third were present in the both sides. In indirect type 55.6% of the hernias were in the right side and the rest were in left side. These findings are quite comparable with the study findings of Ahmed A 14 and Masum M 15 and Khan N16. Although in Lichtenstein series, over 99% patients were operated on under local anesthesia. In our series none of the cases (n=30) were done under local anesthesia. Because of the reasons described later the duration of surgery especially in the complete variety was longer. So scope of local anesthesia was not present. Ambulatory surgery as day case has not yet been developed and accepted by patients in our setting.

In this study mean duration of swelling of hernia was 8.90 (±3.25) years that is longer duration than other studies[16,18,26]. Of hernia repair by Lichtenstein technique. This may be due to incomplete hernia remain untreated for long period of time and gradually beccome enlarged and become complete one. On an average each operation lasted for 1.18 hours. In this study on an average oral feeding started 12.69 hours after the operation that was average 8.62 hours in Khan N16 study of inguinal hernia repair by Lichtenstein technique. Cause may be delayed return of bowel function as in some cases of complete variety of inguinal hernia most of the time hernia content was gut and during repair of complete inguinal hernia herniated gut was returned into abdominal cavity and so there was gut handling. In this study earliest oral feeding time was 4 hours after operation and most delayed oral feeding time was 48 hours.

In this study 2 patients (6.7%) had a prolonged recovery and presented with abdominal distention after operation but settled on a nill per oral regimen. In this cases hernia were bilateral and in these patients it takes more time to return bowel sound. These findings are consistent with that of the other studies[14,15,23]. The median estimated cost of the operation was 15000 taka in general ward. Considering the average length of postoperative hospital stay that was 2.27 days in the present study. It is less than 3 days after operation that is little bit more than other studies[4,21,22,27] of inguinal hernia repair by Lichtenstein technique.

Results of the present study took into account the early complications of surgery following the Lichtenstein technique. In this series 6 (20%) patients developed postoperative urinary retention that was the leading complication occurred after the surgery that was higher than other studies[11,17,20]. of inguinal hernia repair by same technique. In 3 cases urinary retention was relieved by reassurance, hot compression in perineal region or bladder stimulation with the sound of running tape water and in 3 cases urethral catheterization done to relieve urinary retention. In 4 cases scrotal haematoma or seroma and urinary retention both complications

coexist. This was may be due to in complete variety of inguinal hernia repair as there was more tissue dissection in inguino-scrotal region so, there was more chance to develope seroma or haematoma formation or there was more chance to develop tissue oedema in bladder neck area that may causes urinary retention. In this study urinary retention was more common in bilateral cases and also in cases where scrotal haematoma developed. In this series scrotal haematoma formation was observed in 5(17%) cases and local haematoma or seroma formation in incision site was reported in 4 (13%) cases that was also higher than other studies[23,25], of inguinal hernia repair by same technique. Cause may be due to more tissue dissection, large hernia sac and sometimes hernia sac was removed in complete variety where hernia contents were adherned to sac wall. In 6 patients (20%) we used suction drain tube at tissue plane where mesh was placed for draining of blood or seroma and that drain tube was removed 2nd or 3rd postoperative period and we observed no urinary retention or seroma or haematoma related complications in these 6 cases. Using Visual analogue score patients were categorized having mild pain in 13 cases (43.3%), moderate pain in 12 cases (40%) and severe pain in 5 cases (16.6%) after 1st 24 hours of operation. This findings are compitable with other studies[16,26,27] of inguinal hernia repair by Lichtenstein technique Local haematoma or seroma formation was reported in 4 (13%) cases. Periincisional skin echymosis, abdominal distension and superficial wound infection, postoperative pyrexia were the other complications reported. Incidence of these complications in our series is similar to those in other western series[28]. In the current study no case of recurrence was noted within one month of follow up period while Ahmed A 14 reported 1% recurrence rate which is slightly higher than that in the Lichtenstein series but lower than that of Tinckler's series[23]. Like other big western series, the present study found no mesh rejection or mesh infection.

The method is simple and easy, can be performed by all the surgeons - even those without special interest in hernia surgery - and is very effective in the prevention of recurrences. Indeed, an extremely low recurrence rate (range, 0-0.7%) has been reported from many groups of surgeons[29,30]. The method combines many advantages, such as simplicity, effectiveness, safety, comfortable postoperative course with easily controlled pain, rapid return to unrestricted activities, an impressively low recurrence rate and high patient satisfaction.

Conclusion

In the present study an attempt was made to evaluate the early outcome of patients undergoing inguinal hernia repair by Lichtenstein technique. The result reveals that Lichtenstein tension free mesh repair for complete variety of inguinal hernia is safe and reliable. No recurrence or mesh rejection or mesh infection were observed within short time postoperative follow up period and patient's compliance was good with minimum morbidity. At the present time Lichtenstein technique has been established as gold standard surgical therapy for groin hernia.

Recommendations

In the present study, post operative complications like Urinary retention, scrotal haematoma, local haematoma or seroma formation or groin pain were negligible in number. Meticulous haemostasis, avoid of unnecessary tissue dissection, judicious peroperative use of suction drain tube at the tissue plane where mesh was placed may reduce these complications. Long time postoperative follow up is needed for evaluation of mesh related long term complications. So it can be said that, Lichtenstein polypropylene mesh repair is safe and reliable method for the complete variety of inguinal hernia.

Limitations of the Study

Like all other research work the current study was also not without flaw. The study included only a single centre with a relatively small sample size which limits generalizability and observations may be different from the whole country. As duration of

study and follow up period was short so long term results of the operative procedure could not be assessed. Multi-centre studies with larger sample and longer duration of study and more sound study design could bring more insight regarding this issue.

Conflict of interest: none.

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