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Original research article

Lichtenstein Repair of Inguinal Hernia- Post Operative Complications

Dr Khushbu Omprakash Gandhi[1], Dr Mukteshwar Deshmukh[2], Dr Pankaj Nandagawali[3], Dr Vaishakh Rai[4]

[1]Senior Resident, Indira Gandhi Government Medical College and Hospital, Nagpur.

[2]Associate Professor, Indira Gandhi Government Medical College and Hospital, Nagpur.

[3]Assistant Professor, Indira Gandhi Government Medical College and Hospital, Nagpur.

[4]Junior Resident, Indira Gandhi Government Medical College and Hospital, Nagpur.

[1,2,3,4]Department of Surgery

Corresponding Author: Dr Vaishakh Rai

E-mail: vaishakrai24@gmail.com

Abstract

Background: Inguinal hernia is one of the commonest surgical problems encountered by surgeons worldwide, thus is the most evolving topic even today for better results of its repair. The main aim of surgeon is to lower the recurrence rate. Lichtenstein technique has opened a new era with a very low recurrence rate even in the hands of young or budding surgeons. Hence the present study was undertaken to assess the outcome of inguinal hernia repair by Lichtenstein technique.

Method: A total of 80 cases underwent Lichtenstein repair using Polypropylene mesh including 99% males and 1% female were studied. The clinical profile of patients, post-operative pain, time required to return to basic activity and time required to return to work, post-operative complications were noted. All cases were followed up post-operatively for 2 years.

Results: Out of 80 patients, 91% were unilateral, 9% were bilateral, 65% were indirect, 29% were direct and 6% were pantaloon hernia. Mean operative time was 68.34 min. Resumption of routine activities was within 24 hours post-operatively and mean time taken for return to work was 9.36 days. Post-operative pain was seen in 82.5% of cases. Mean pain score was high on post-operative day 1 (2.62), which was decreased on post-operative day-7 (0.8) then post-operative day-30 (0.21). The commonest early post-operative complications was suture site infection (9%) and long term complications was chronic Inguino-dynia (11.42%) with no recurrence.

Conclusion: Lichtenstein technique of hernia repair is safe, simple to perform with minimum postoperative morbidity, early recovery, less hospital stay and very low recurrence rate.

Keywords: Inguinal hernia; Recurrence; Lichtenstein technique; Polypropylene mesh; Repair

Introduction

Inguinal hernia is one of the commonest worldwide surgical problem. In adults, 80% of all hernia surgeries are for inguinal hernia [1]. The chance of a person having to undergo an inguinal hernia surgery during his/her lifetime is quite high, 27% in men and 3% in women [2-4]. There were no written surgical guidelines for hernia treatment until 2009, when the European Hernia Society (EHS) published its recommendations based on analysis of literature and the result of clinical trials. According to EHS guidelines mesh based techniques, the Lichtenstein technique in particular, is recommended for the treatment of primary inguinal hernia in adults [2, 3].

The benchmarks against which a successful hernia surgery is evaluated are recurrence rate, rate of complication including chronic groin pain, low cost and time taken to return to normal activities [5]. Improvement in surgical technique and better understanding of the anatomy and patho-physiology of the inguinal canal have significantly improved outcomes for many patients.

Although the successful surgical repair of hernia depends on a tension free closure of the hernia defect to attain the lowest recurrence rate. Previous efforts to simply identify the defect and suture it, resulted in unacceptable high recurrence rates. Modern techniques have improved the recurrence rates by placement of mesh over hernia defect or in the case of laparoscopic repair behind the hernia defect. Benefit of the tension free closure is that it has been shown to cause significantly less pain and discomfort in the postoperative period. Also it is very simple, effective, is associated with a very low recurrence rates (ranging from 0 to 2 % in the literature) and can be performed under local or regional anesthesia [6, 7]. The Lichtenstein operation to a great extent achieves all these goals [8, 9], therefore it is currently the preferred method for the plastic reconstruction of inguinal hernias for the majority of surgeons around the word. Hence the present study was undertaken to assess the outcome of inguinal hernia repair by Lichtenstein technique.

Materials and Methods

This prospective and interventional study was conducted in total 80 cases of either sex, age ≥18 years, presented with unilateral or bilateral hernia and recurrent hernia in the Department of Surgery, at Tertiary Care Centre, during a period from June 2018 to November 2020. Patients of age less than 18 years and those with complicated inguinal hernias or those having wound or infection in inguinal region were excluded from the study.

A detailed history of patient was entered in case proforma. Complete hemogram, KFT, LFT, blood group, HIV, HBs-Ag, Chest X-ray, ECG were done in all patients. USG KUB [prostate] done in patients with signs and symptoms of BPH or enlarged prostate on digital rectal examination. Patients with predisposing factors were treated for the same prior to hernia surgery. Patients were informed about surgical procedure and written informed consent was taken.

Routine administration of one dose of pre-operative antibiotic injection Amoxicillin plus clavulanic acid 1.2 gm IV was given to all the patients and repeated after 8 hours. Thereafter tablet Amoxicillin plus clavulanic acid 625 mg was given twice daily for 3 days. All patients underwent Lichtenstein repair using Polypropylene mesh. Diclofenac injection 75 mg intra-muscular was given on the day of surgery 6 hours after surgery. Tab Diclofenac 50 mg was given to all patients thrice a day for 3 days initially and thereafter on demand. Pain score was

assessed on 1st, 7th and 30th day in postoperative period using Visual Analogue Scale (VAS) and a score of >5 after 3 months was labelled as Chronic Groin Pain. Operative time was noted. Return back to basic activities was described as the patient's ability to perform basic activities (getting up from bed, walking without any support by himself) and was calculated in hours and days. Return to work was described as the patient's ability to resume his occupation as before surgery. Early and late post-operative complications were noted. Patients were followed up in surgical OPD during the post-operative period for a minimum period of 6 months and thereafter up to 2 years.

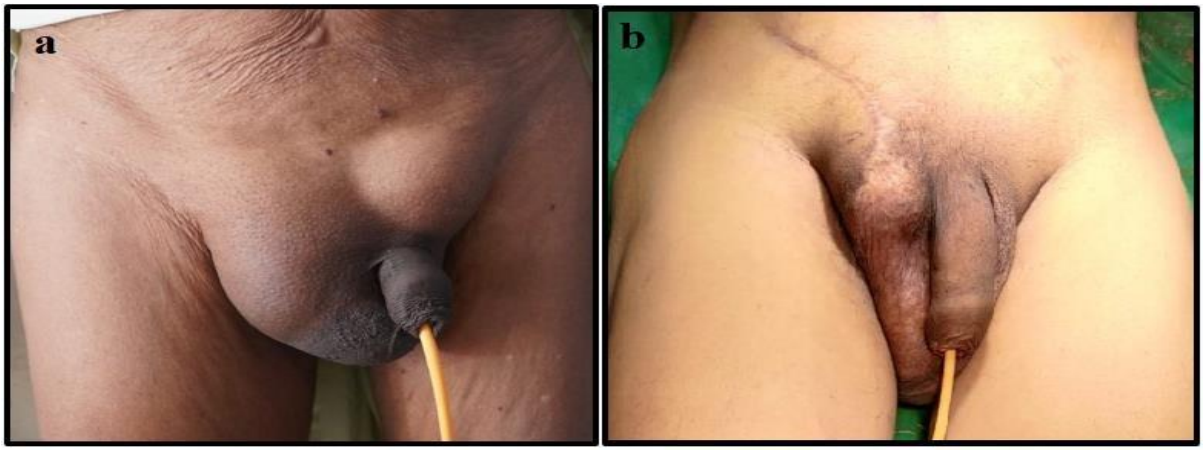

Figure 1: a) Bilateral inguinal hernia; b) Recurrent inguinal hernia

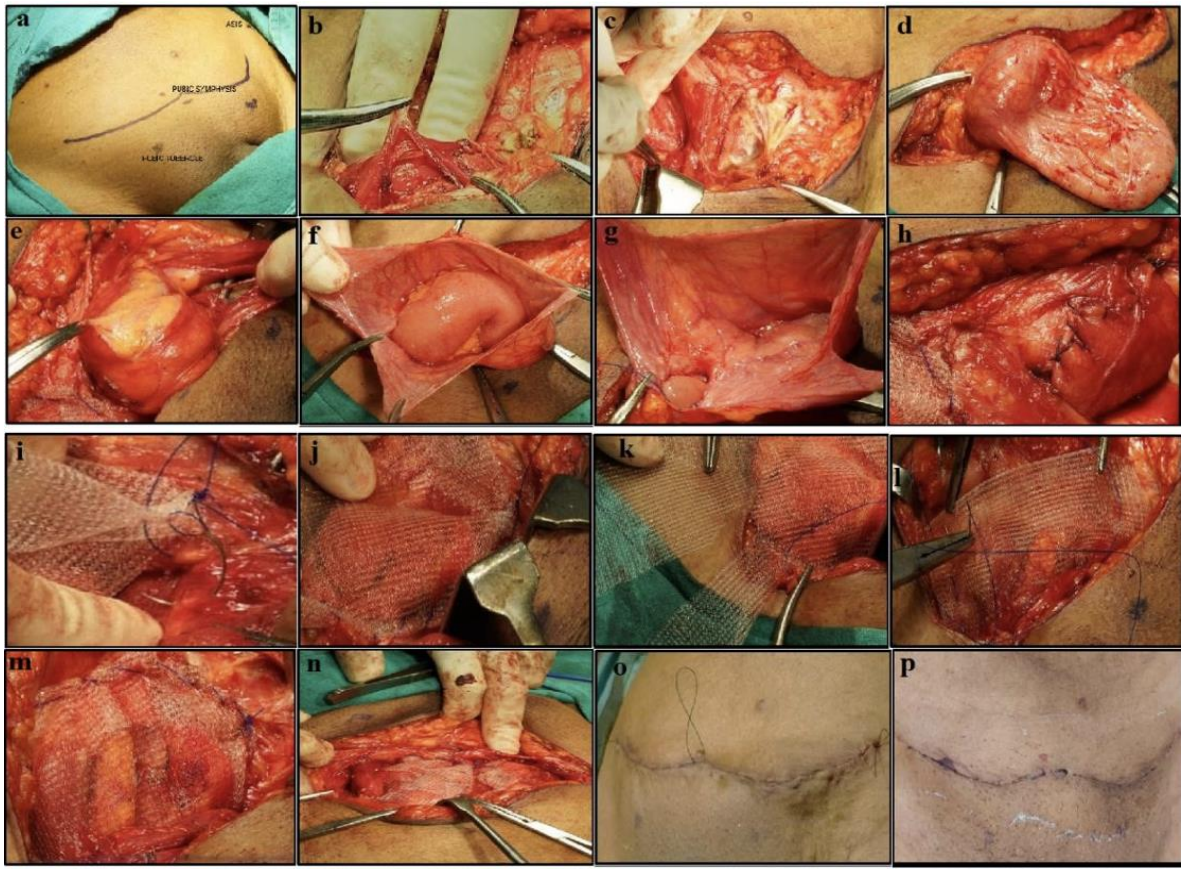

Figure 2: Intra-operative Images- a) Surface landmarks and incision marking**; b)** Ilio-inguinal nerve**; c)** Adequate exposure on medial side**; d)** Indirect hernial sac**; e)** Direct hernial sac and its contents**; f)** Indirect sac and its contents**; g)** High ligation of sac with purse string suture**; h)** Posterior wall repair for direct hernia**; i)** Fixation of medial end of mesh**; j)** Fixation

of lower flap of mesh to upturned part of inguinal ligament with continuous sutures**; k)** Creating upper and lower flap**; l)** Fixation of upper flap to conjoined tendon with same suture in continuous fashion**; m)** Completely fixed mesh on one side**; n)** Mesh fixed bilaterally**; o)** Wound closure with cuticular sutures**; p)** Scar photo on pod-7

Observations and Results

Total 80 cases were studied during the study period, of them maximum were in the age group of 41-50 years (32.50%) followed by 51-60 years (23.75%) as shown in table 1. The mean age of patients was 46.69 years, ranged from 22 to 78 years with male predominance.

Table 1: Demographic characters of patients

Demographic data		**No. of Patients**	**Percent**
Age In Years	18 – 20	0	0%
	21 – 30	10	12.50%
	31 – 40	13	16.25%
	41 – 50	26	32.50%
	51 – 60	19	23.75%
	61 – 70	09	11.25%
	71 – 80	03	03.75%
	81 and above	0	0%
Gender	Male	79	98.75%
	Female	01	01.25%

Most of the cases (60%) had right sided inguinal hernia and 65% cases had indirect inguinal hernia. Chronic smoking (35%) was the commonest predisposing factor followed by obstructive uropathy (28.75%). However, the many patients had more than one predisposing factors. Diabetes mellitus (16.25%) was the most common co-morbidity followed by hypertension (12.5%) as shown in table 2.

Table 2: Clinical profile of patients included in the study

Clinical profile		**Frequency**	**Percent**
Side of Hernia	Right	48	60%
	Left	25	31.25%
	Bilateral	07	08.75%
Type of hernia	Indirect	52	65%
	Direct	23	28.75%
	Pantaloon	05	06.25%
Predisposing Factors	Chronic Smoker	28	35%
	Obstructive Urinary Symptoms Or BPH	23	28.75%
	Chronic Cough	06	7.5%
	Chronic Constipation	04	5%
	H/O Hernia Surgery On Same Side	02	2.5%
	Diabetes Mellitus	13	16.25%
Comorbid Conditions	Hypertension	10	12.5%
	Asthma	04	5%
	IHD	03	3.75%

The mean value of study parameters like operative time, time taken for mobilization postsurgery, time required to go back to basic daily activities and time taken to return back to work in unilateral and bilaternal hernia repair are depicted in figure 3.

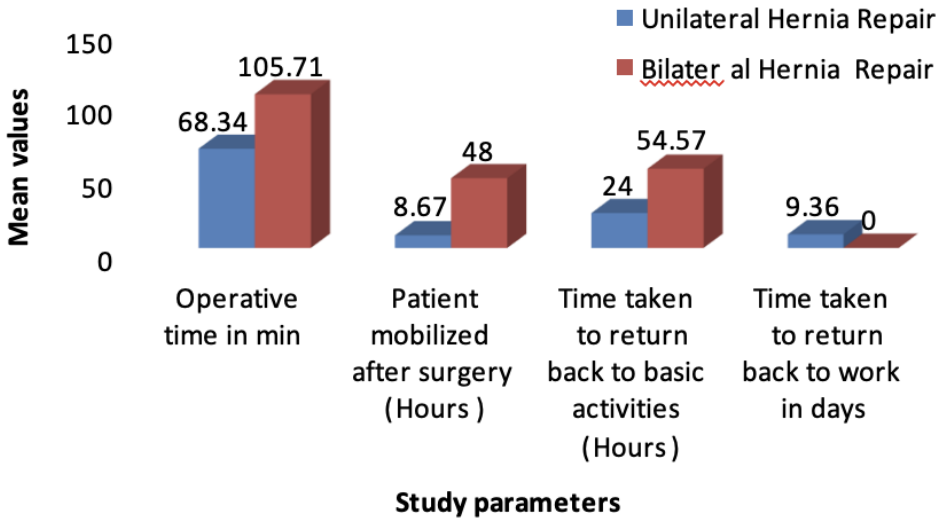

Figure 3: Study parameters like operative time, time taken for mobilization post-surgery, time required to go back to basic daily activities and time taken to return back to work

Post- operative pain was calculated using VAS score, which was seen in 82.5% of cases (66 cases), of them 52 patients (65%) had mild pain, 12 patients (15%) had moderate pain and 2 (2.5%) had severe pain. Pain was easily relieved by using single analgesic (Injection diclofenac 75 mg intra-muscular 12 hours apart and followed by tablet diclofenac 50 mg 8 hourly for 3 days). The mean pain score was high on post- operative day 1, which was decreased on post-operative day 7 then post- operative day 30 as depicted in figure 4.

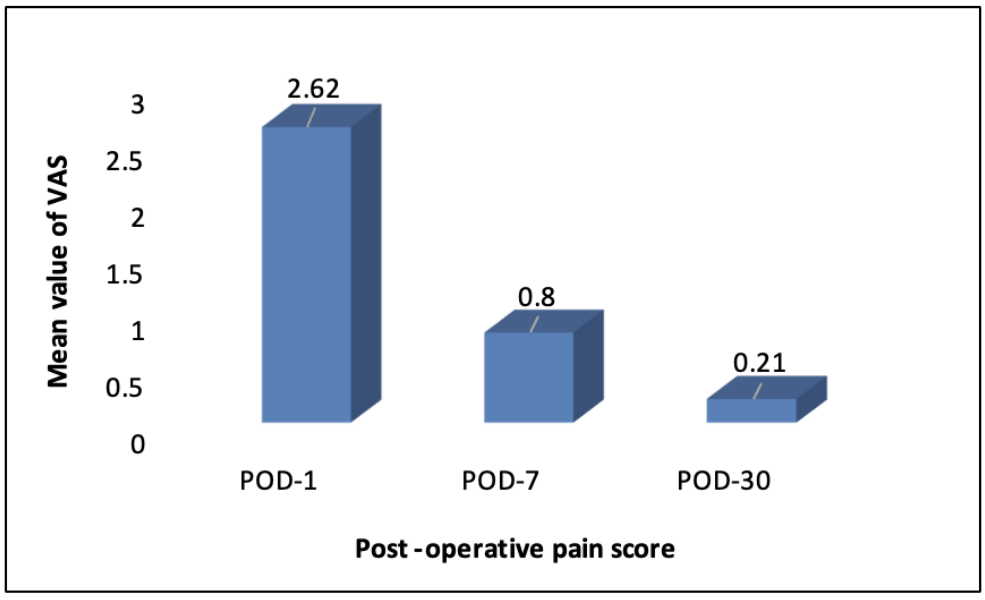

Figure 4: Post-Operative Pain Score The commonest early post-operative complications seen were suture site infection found in 7 (9%) patients, of them 6 (85.71%) patients were diabetic. Second most common complication observed was cord oedema or funiculitis (7.5%) with or without scrotal swelling as shown in table 3.

Table 3: Early post-operative complications

Complication	Frequency	Percent	Measures Taken
Suture site infection	07	8.75%	5 patients required removal of sutures. 2 patients had wound gaping and required secondary suturing.
Cord oedema or Scrotal swelling	06	7.5%	Managed conservatively.
Acute retention of Urine	05	6.84%	4 patients managed conservatively. 1 patient required catheterization.
Seroma	04	5%	3 patients required aspiration with 18 G needle. 1 patient managed conservatively.
Hematoma	02	2.5%	1 patient was managed conservatively. 1 patient required drainage.
Hypoesthesia over pubic symphysis	02	2.5%	Managed conservatively.

Out of 80, 70 patients (87.5%) completed follow up for minimum 3 months and thereafter till 6 months. Rest of the patients had loss to follow up (12.5%). 75% (60) patients completed follow up of 1 year and only 35% patients (28) could complete follow up of 2 years. Most common late post-operative complication seen was foreign body sensation (11.42%) followed by chronic groin pain (4.28%) as shown in table 4. There was no recurrence till date and none of the patient had mesh infection requiring removal or testicular atrophy.

Table 4: Late post-operative complications

Long Term Complications	Follow Up			Measures Taken
	3 months	6 months	1 year	
	70 patients (87.5%)	70 patients (87.5%)	60 patients (75%)	
Foreign body sensation	11.42% (n=8)	4.28% (n=3)	-	Re- assurance
Chronic groin pain	4.28% (n=3)	1.42% (n=1)	-	Analgesics and re-assurance

Discussion

In the present study, the greatest number of cases were seen in the age group of 41-50 years (32.5%) followed by 51-60 years (23.75%). The mean age of patients was 46.69 years with male predominance (99%). Male to female ratio was 79:1 (98.75% male). The maximum number of cases were seen in the old and middle age group because they are exposed to risk factors like chronic cough, obstructive urinary symptoms and chronic smoking. Similar findings are reported in study conducted by Kalwaniya D et al [10] and Nateson AK et al [11]. The reason for male preponderance of inguinal hernia could be due to the fact that men have an inherent weakness along the inguinal canal because of the weak spot in the inguinal canal, where the spermatic cord enters the scrotum. This does not happen in the woman [12].

Inguinal hernias are more common on right side [13, 14]. The cause may be because of delayed descent of the right-side testicle [15]. In current study also right sided inguinal hernia was most common which is comparable with the previous studies [11, 10, and 16]. The indirect type of inguinal hernia was seen more commonly, which is comparable to the incidence in literatures [10, 16]. 28.75% patients had obstructive urinary symptoms, 7.5% patients had chronic cough and 5% patients had history of chronic constipation; all of them cause increase in intra-abdominal pressure leading to higher incidence of indirect inguinal hernia in this study. 35% patients were chronic smokers, and tobacco leads to disruption of connective tissue leading to higher incidence of hernia formation in such patients [17]. The incidence of diabetes in the current study was much higher. This may be attributed to the fact that overall incidence of diabetes is rising among old age group in India [18].

The mean operative time taken for unilateral hernia repair was 68.34 min (Ranged- 45-85 min) and for bilateral 105.71 min (Ranged- 95-120 min) which is similar to earlier studies [11, 16, and 19]. Patients were mobilized with mean time of 8.67 hours (Ranged - 6-12 hours) in operated cases of unilateral hernia. Patients operated for bilateral inguinal hernia were catheterized for 48 hours and were mobilized after catheter removal. Patients were discharged once they return back to basic activities. Time taken by patients to return back to basic activities and the post- operative hospital stay ranged between 18-30 hours with mean of 24 hours for unilateral hernia. Patients operated for bilateral inguinal hernia return to basic activities within 50-60 hours with mean time of 54.57 hours. Results of mean time required for post-operative ambulation is comparable to the study done by Sakorafas G et al [20] and results of post-operative hospital stay are comparable to studies done by Shirah BH et al [19] and Gupta M et al [21]. The mean time taken by patients to return back to work was 9.36 days with the range of 7-20 days which is comparable with the other studies [11, 19].

In the present study, among 73 cases of unilateral inguinal hernia, 5 patients (6.48%) developed acute urinary retention post-operatively. All the bilateral hernia patients were pre- operatively catheterized and catheter removed only after 48 hours post- operatively. 4 of the 5 patients developing urinary retention were managed conservatively and 1 patient required catheterization. These findings are comparable with the study done by Kalwaniya D et al [10] and Gupta M et al [21]. Urinary retention is usually precipitated in elderly patients, especially if symptoms of prostatism are present [22]. This is also common in patients developing scrotal oedema or hematoma post-operatively in cases of complete variety of inguinal hernia, as there is more tissue dissection in inguinoscrotal region and hence developing tissue oedema in bladder neck area. Hence, no attempt should be made to remove the distal part of the sac.

On VAS 14 patients (17.5%) had no pain, 52 patients (65%) had mild pain, 12 patients (15%) had moderate pain and 2 patients (2.5%) had severe pain which is similar to Kalwaniya D et al study [10]. The mean pain score was 2.62 on post- operative day 1, 0.8 on post- operative day 7 and 0.21 on post- operative day 30. Post-operative local seroma or hematoma formation is a common complication after surgery, the incidence being in the range of 5-25% [10]. In current study, the incidence of development of seroma was 5% (4 patients), which is comparable with the results of other studies [16, 20, 21]. Out of 4, 3 patients required aspiration (done with 18 G needle) after wait for 4 weeks and it was resolved spontaneously in 1 patient. 2 patients (2.5%) developed hematoma post-operatively. 1 patient was managed conservatively another patient required wound exploration and drainage of hematoma (30-40 cc), after achieving proper haemostasis CRD was placed in subcutaneous plane, which was removed after 3 days and patient was discharged on postoperative day 6.

Early complications- 7 patients (8.75%) developed suture site infection, 5 of these patients required removal of 1 or 2 sutures with drainage of pus and daily cleaning and dressing of wound for 5-7 days. Patients required prolonged antibiotic and analgesic coverage. 2 patients had complete wound gaping and required cleaning and dressing for 7-10 days and secondary suturing after that with prolonged antibiotics and analgesics. 6 out of 7 patients were diabetic. Comparable results are reported by Nateson AK et al [11] and Kabir ASMA et al [16]. The incidence of suture site infection was high as compared to the studies done worldwide [10, 11, 16, 19-21]. The reason can be attributed to higher incidence of diabetes in the present study as 85.71% patients developing suture site infection (6 out of 7) were diabetic. 6 patients (7.5%) developed cord oedema which was managed conservatively with analgesics along with supplements of anti-inflammatory drugs and scrotal support. Cord oedema and transient scrotal swelling develop mostly in cases of complete indirect variety of inguinal hernia due to excessive dissection and cord handling. No attempt should be made to remove the distal portion of the sac to minimize cord oedema. 2 patients (2.5%) developed hypoesthesia over skin over pubic symphysis which was managed with reassurance.

Long term complications- 3 patients out of 70 patients (4.28%) had chronic groin pain and required analgesics (non-narcotic) and reassurance. At the end of 6 months only 1 patient (1.42%) had complained of pain. This finding is comparable with the study done by Sakorafas G et al [20] and Masum M et al [23]. Foreign body sensation was seen in 11.42% patients at the end of 3 months and in 4.28% patients at the end of 6 months. None of the patient had foreign body sensation followed up at 1 year. These patients were given re-assurance. Results were similar to study done by Nateson AK et al [11]. None of the patients reported recurrence during the study period. Other long- term complications such as Testicular atrophy or mesh infection requiring removal of mesh were not observed in the present study. There was no mortality in the present study.

Conclusion

Lichtenstein tension-free mesh inguinal hernia repair is a simple, safe, comfortable, effective method, with minimum postoperative morbidity, early recovery, less hospital stay and very low recurrence rate. Also the study shows good tolerance on the part of patient and minimal complication in a short- term period. Therefore it is our preferred method for hernia repair.

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