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# Open Inguinal Hernia Repair Utilizing a Prolene Mesh (Lichtenstein's Operation): Study in Tertiary Care Hospital in Bangladesh

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**Abstract** | **Original Research Article**

***Background:*** One of the most common surgeries is inguinal hernia repair. The best procedure for inguinal hernia repair is still debatable. Open Lichtenstein tension-free mesh repair (LMR) is one of the most popular open procedures with good outcome. ***Objective:*** To assess the open inguinal hernia repair using a Prolene mesh (Lichtenstein's procedure). ***Materials and Methods:*** The observational study was carried out at the Department of General Surgery in Kushtia Medical College Hospital. 60 consecutive adult patients seen in the surgical outpatient department with inguinal hernias were scheduled for elective mesh repair. Patients below 18 years, emergency cases, and immuno-compromised patients were excluded. All patients were informed of the use of the mesh and informed consent was sought and obtained pre-op. Patients were not charged for the mesh and were promised free care in case of recurrence. ***Results:*** Hernias were discovered in 31(51.7%) of the patients, 45 (75.0%) of whom had direct hernias, with a mean duration of 2.30.5 years. 28 patients (46.7%) required a hospital stay of 2-4 days. Surgical complications following two groups of patients (3.3%) suffered urinary retention, while 6 (10.0%) patients developed Haematoma. At the 4-week checkpoint, 19(31.7%) of the patients reported sensory loss, 1 (1.7%), seroma, 1 (1.7%), discomfort, and 1 (1.7%), recurrence. ***Conclusion:*** In conclusion, the majority of hernia was discovered to be Direct and ASA Grade I. Haematoma and urine retention were discovered as postoperative consequences. Four weeks later, there was sensory loss, seroma, discomfort, and recurrence.

**Keywords:** Hernia repair, Mesh repair (LMR), Lichtenstein's procedure and surgical complecations.



## INTRODUCTION

Inguinal hernia repair is one of the most frequently performed surgeries. The unique method for inguinal hernia repair remains controversial. Free mesh repair open Lichtenstein tension (LMR) is one of the most preferred open techniques with satisfactory outcomes. With open procedures laparoscopic approach in inguinal hernia surgery remains controversial, especially in comparison [1]. Every year in general surgery, inguinal hernia repair is the most common procedure with more than 20 million patients being repaired globally [2, 3]. The lifetime incidence of groin hernia is 27- 43% in men and 3-6% in women [4, 5]. According to international guidelines, symptomatic groin hernias should be surgically repaired [5]. Most of these patients will eventually require surgery in a late time. While the asymptomatic or minimally symptomatic inguinal hernias may be managed with "watchful waiting," [5, 6] and in the majority of patients the meta-analysis comparing watchful waiting and operation indicated that watching waiting only merely delays rather than avoids operation [7]. The rate of recurrence of inguinal hernia repair has been reported to be 1.7%. Additionally, occurrence of postoperative complications, including seroma, chronic pain and numbness, has been reported to be very low. The only treatment of inguinal hernias is surgery. The herniated tissue is supported by repairing various methods. The common pubic bond between the public is not a treatment method. On the contrary, this bond weakens the inguinal canal with pressure. Surgical methods can be performed under local or general anesthesia, and the laparoscopic method is done only under general anesthesia. Inguinal hernias are diseases that must be treated surgically [8]. Inguinal hernia repair is one of the most common general surgeries. Even residents can perform this operation under appropriate coaching by surgical staff. If the residents can perform the inguinal hernia repair for surgical training, there is a very valuable chance to educate about basic surgical procedures. Lichtenstein *et al.*, described the use of

mesh in the operative technique for tension-free inguinal hernia repair with satisfactory outcomes; Lichtenstein *et al.*, described the use of mesh in the operative technique which popularized the use of polypropylene mesh among the general surgeons [9]. Due to ease of performance along with low recurrence rates, the open Lichtenstein mesh repair of inguinal hernia has become a standard for inguinal hernia repair [10].

## METHODOLOGY & MATERIALS

The observational study was carried out at Department of General Surgery in Kushtia Medical College Hospital. 60 consecutive adult patients seen in the surgical outpatient department with inguinal hernias were scheduled for elective mesh repair. Patients who were below 18 years, emergency cases, and immuno-compromised were excluded. Patients were not charged for the mesh, and were promised free care in case of recurrence. All patients were assigned for either spinal anesthesia or local infiltration. For all intravenously just before surgery and continuing for 24 hours or until removal of a drain if used, prophylactic antibiotics were prescribed. In a tension-free manner, indirect hernial sacs were excised while direct sacs were inverted; the defects were either narrowed (indirect) or closed (direct) with Nylon 1, taking only the transversal is fascia. To fit the inguinal canal anatomy, was implanted lichtenstein' as a tension-free only patch under the external oblique, mesh, about 6x12 cm with the medial edges rounded off. By blunt dissection to accommodate the mesh and increase the area covered, and the pubic tubercle was overlapped by 1-1.5 cm, the external oblique was peeled off the underlying tissue superiorly. To overlap the lower tail and fit the cord snugly, an end-slit was made in the mesh for the spermatic cord laterally, the superior tail being crossed. With interrupted Nylon 2/0 (instead of running sutures as in true Lichtenstein repair 10) from the pubic tubercle to a point beyond the deep ring laterally, the inferior edge of the mesh was secured to the inguinal ligament. To a point just beyond the internal ring laterally, the superior edge was sutured to the underlying internal oblique also with interrupted Nylon 2/0. Both tails where they overlap near the spermatic cord to secure them to the underlying tissue lateral to the deep ring we placed one suture passing through. As it would be in true lichtenstein repair, the lower edge of the superior tail was not sutured to the inguinal ligament. A true tension-free repair and a slight bulge in the middle of the mesh indicated adequate laxity. In cases of large complete hernia, cosure was as in routine herniorrhaphy. Closed suction drain or scrotal bandage was used. Patients were followed for recurrence, pain, surgical site infection and any other complications or complaints. The data were analyzed with the SPSS for Windows (IBM SPSS Statistics for Windows, version 23.0, Armonk, NY: IBM Corp.) software. For descriptive statistics means, medians, standard deviations & ranges were analyzed for numerical data and frequencies & proportions for categorical data were calculated as required.

## RESULTS

**Table I: Demographic characteristics of the study populations (N=60)**

| | Frequency (n) | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| ≤30 yrs. | 11 | 18.3 |
| 31-40 yrs. | 17 | 28.3 |
| 41-50 yrs. | 24 | 40.0 |
| 51-60 yrs. | 8 | 13.3 |
| Mean ±SD | 40.6±17.2 | |
| **Sex** | | |
| Male | 52 | 86.7 |
| Female | 8 | 13.3 |
| **Occupational status** | | |
| Employed | 34 | 56.7 |
| Unemployed | 26 | 43.3 |
| Mean BMI (kg/m$^2$) | 23.5±4.0 | |
| **ASA** | | |
| Grade I | 33 | 55.0 |
| Grade II | 24 | 40.0 |
| Grade III | 3 | 5.0 |

Table I showed that the mean age was found 40.6±17.2 years. The Majority 24(40.0%) of patients were belonged to age 41-50 years, 52(86.7%) were male, 34(56.7%) were employed, mean BMI was found 23.5±4.0 kg/m$^2$ and 33(55.0%) were ASA grade I.

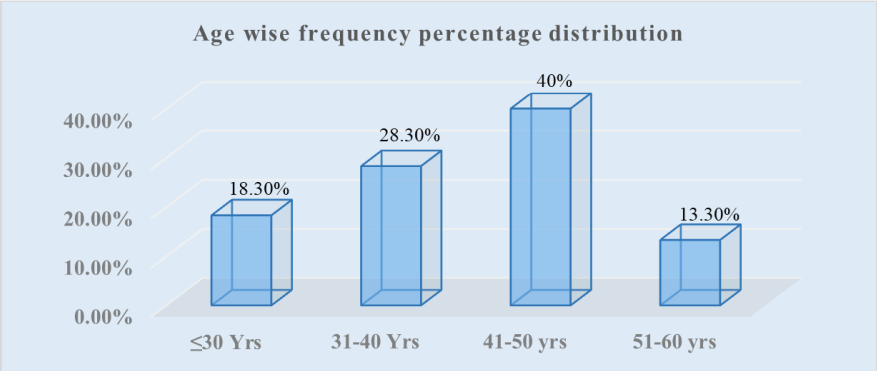


**Figure 1: Bar chart showed the frequency percentage of the age of the study populations**

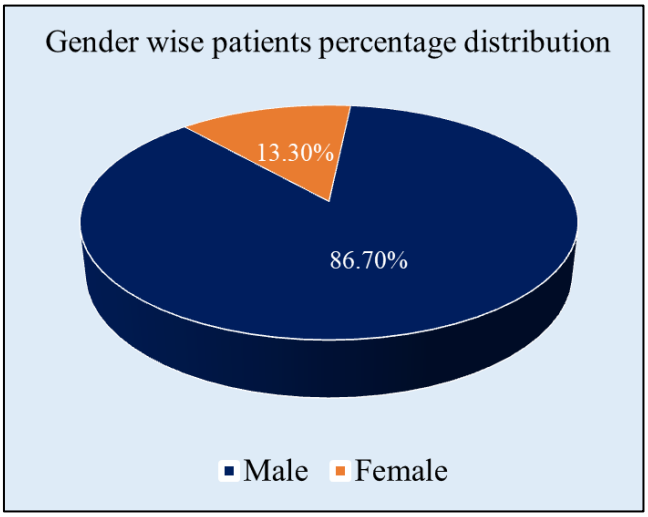


**Figure 2: Pie chart showed the gender percentage of the study populations**

**Table II: Patients characteristics of the study populations (N=60)**

| | Frequency (n) | Percentage (%) |
|---|---|---|
| **Site of hernia** | | |
| Left | 29 | 48.3 |
| Right | 31 | 51.7 |
| **Type of hernia** | | |
| Direct | 45 | 75.0 |
| Indirect | 14 | 23.3 |
| Recurrent | 1 | 1.7 |
| Mean duration of hernia (years) | 2.3±0.5 | |
| **Anesthesia** | | |
| Local | 33 | 55.0 |
| Spinal | 21 | 35.0 |
| General | 6 | 10.0 |
| Mean duration of operation (minutes) | 50 | |

Table II showed that 31(51.7%) patients were found right site of the hernia, 45(75.0%) were direct hernia, the mean duration of hernia was 2.3±0.5 years, 33(55.0%) patients received local anesthesia and the Mean duration of operation was 50 minutes.

**Table III: Patients characteristics of the study populations (N=60)**

| Hospital stay (days) | Frequency (n) | Percentage (%) |
|---|---|---|
| <2 days | 25 | 41.7 |
| 2-4 days | 28 | 46.7 |
| >4 Days | 7 | 11.7 |

Table III showed that highest 28(46.7%) of patients had a hospital stay of 2-4 days, followed by.

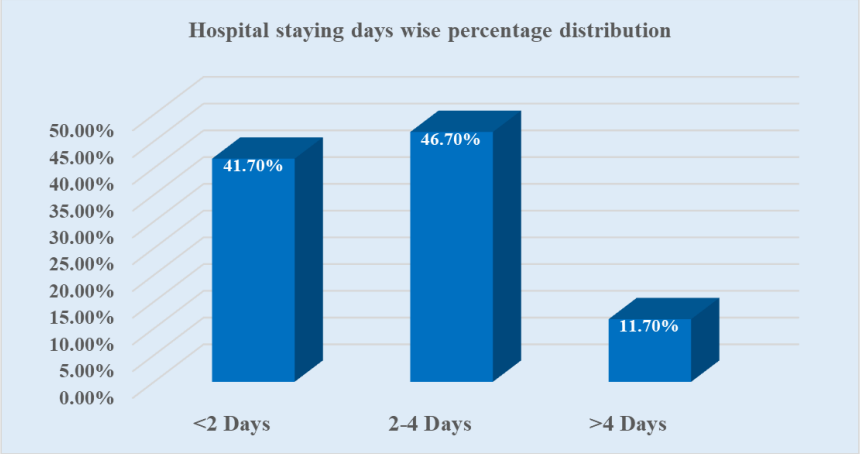


**Figure 3: Bar chart showed the percentage of the hospital staying days of Patients**

**Table 4: Postoperative complications of the study populations (N=60)**

| | Frequency (n) | Percentage (%) |
|---|---|---|
| Hematoma | 6 | 10.0 |
| Urinary retention | 2 | 3.3 |

Table IV showed that 6(10.0%) patients had hematoma and 2(3.3%) had urinary retention.

**Table 5: At 4 weeks follow up (N=60)**

| | Frequency (n) | Percentage (%) |
|---|---|---|
| Seroma | 1 | 1.7 |
| Sensory loss | 19 | 31.7 |
| Pain | 1 | 1.7 |
| Recurrence | 1 | 1.7 |

Table V showed at 4 weeks follow up, 19(31.7%) patients had sensory loss followed by 1(1.7%) had seroma, 1(1.7%) was pain and 1(1.7%) was recurrence.

## DISCUSSION

In this study observed that the mean age was found 40.6±17.2 years. The Majority (40.0%) of patients have belonged to age 41-50 years, 52(86.7%) were male, 34(56.7%) were employed, mean BMI was found 23.5±4.0 kg/m$^2$ and 33(55.0%) were ASA grade I. Lakshmana *et al.*, reported mean age for all in one meshplasty group was 51.36 years [11]. Mahajan *et al.*, observed participants were males and most of them were from manual labor backgrounds 38(76%). [12] Most of the patients belonged to 26-35-year age group 18(36%). The mean age of presentation was 40.58±10.46 yrs. Guttadauro *et al.*, it was of average 61.7 years [13]. Usoro *et al.*, reported the mean age was 38±17.4 years. 50% were aged 19-25 years and male female ratio was 2:1. [14] Frey *et al.*, reported the patients involved were 285 men and 13 women, with a median age of 56 (range 40-91) years [15]. Median BMI was found 24.9 kg/m$^2$ and 164(55.0%) were ASA grade I. In this study observed that 31(51.7%) patients were found right site of hernia, 45(75.0%) were direct hernia, min duration of hernia was 2.3±0.5 years, 33(55.0%) patients received local anaesthesia and mean duration of operation was 50 minutes. Lakshmana *et al.*, operative time noted in all in one meshplasty was 55.3 mean on average whereas on conventional meshplasty it was 61.7 min which was significant [11]. Guttadauro *et al.*, study discharge of patients was done within 24 hours in all 250 patients, which can be considered to be effected due to better availability of health care at the place of study [13]. Mahajan *et al.*, reported 40 participants were found to have indirect hernias (80%). [12] Right sided hernia was found more common 33(66%) patients. The mean duration of surgery was 31.96±2.303 min. In men, indirect hernias predominate over direct hernias at a ratio of 2:1. Right sided hernias are more common than left sided hernias [16]. Frey *et al.*, reported 77(22.3%) hernia repairs were performed under local anaesthetic with or without sedation [18]. Spinal, epidural and general anaesthesia were used in 131(38%), 53(15.4%) and 84(24.3%) operations respectively. 23(6.7%) patients had a recurrent hernia. Usoro *et al.*, observed nine surgeries were done entirely under local infiltration and/or spinal anesthesia [17]. Two cases had spinal anesthesia supplemented by local infiltration because spinal wore out in one, and failed from the outset in the other. Three cases were converted to general anesthesia because spinal anesthesia wore out in one (bilateral hernia), another could not tolerate local

anesthesia after start of surgery, and the third had failed spinal and local anesthesia in sequence. Even though 11(91.7%) had no need for analgesics by 3rd-7th day post-operative. In this study that 28(46.7%) of patients had hospital stay of 2-4 days. Lakshmana *et al.*, reported patients average hospital stay in all in one meshplasty group was 3.14 where as in conventional meshplasty was 4.46 days [14]. Frey *et al.*, observed the majority (36.2%) of patients had hospital stay three days. [15] Mahajan *et al.*, observed the mean duration of hospital stay was 1.9±1.488 days [12]. Current study observed that 6(10.0%) patients had haematoma and 2(3.3%) had urinary retention. Hayashi *et al.*, reported subcutaneous hematoma was found more frequently after MP repair compared with after PHS repair (3.8 vs. 1.3 %, $P = 0.013$). [17] Frey *et al.*, reported 3(0.9%) patients had reoperation for haematoma, 18(5.2%) had haematoma and 4(1.2%) had urinary retention. [15] At 4 weeks follow up, 19(31.7%) patients had sensory loss followed by 1(1.7%) had seroma, 1(1.7%) was pain and 1(1.7%) was recurrence. Lakshmana *et al.*, reported the mean VAS pain score was found to be 5.04±0.90 in first 12 hours and 0.3±0.4 in after 1 week. [11] Frey *et al.*, reported seroma formation occurred significantly more often in the mesh plug group ($P$ = 0·022) [15]. Moderate or severe pain was reported by a similar number in each group. Another eight patients had reoperation within 4 weeks of hernia repair, four because of seroma formation, two with nerve entrapment causing severe pain, and two with a symptomatic femoral hernia. The latter patients were both in the Lichtenstein group, and the hernia was missed during the first operation. Neumayer *et al.*, reported a rate of neuralgia or other pain of 14.3%, considerably higher than in the present investigation. [18] Picchio *et al.*, showed that pain after open hernia repair was unaffected by elective dissection of the ilioinguinal nerve [19]. In their study resection of the ilioinguinal nerve was significantly related to sensory disturbances in the area of distribution of the nerve. Mahajan *et al.*, reported the mean pain score in first 24 hours was 6.82±1.848 [12]. Pain scores decreased markedly at two weeks after surgery. At two weeks, the PHS pain score was 1.24±0.797. On the first postoperative day, 80% of the patients were released with mild pain and no evidence of problems. These findings are consistent with previous findings using open mesh approaches [20, 21]. Hayashi *et al.*, reported recurrences were detected in 14 patients with PHS repair and two patients with MP repair (1.5 vs. 1.1%, $P = 0.956$) [17].

## CONCLUSION

In conclusion, the majority hernia was discovered to be Direct and ASA Grade I. Haematoma and urine retention were discovered as postoperative consequences. Four weeks later, there was sensory loss, seroma, discomfort, and recurrence.

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