

## ORIGINAL PAPER

# A Clinical Study on Lichtenstein Inguinal Hernioplasty Using Prosthetic Mesh

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### ABSTRACT

**Introduction:** Inguinal hernia is one of the commonest problems requiring surgical intervention. Surgeons all over the world have tried to perfect the ultimate hernioplasty in recent times for which various techniques and variations have been undertaken so that a mind stretching variety of operations are available to deal with the problem of inguinal hernia. **Aims and objectives:** The aim of the study was to study the Lichtenstein prosthetic mesh tension free repair with respect to technique pitfalls and also the clinical presentation with respect to symptoms and signs and the indications and contraindications for the procedure. **Materials and Methods:** A total 56 hernia repairs of 52 patients performed in a tertiary care centre during a period of one year were studied. **Result:** All the patients were male with a mean age of 48.86 years and maximum (26.9%) belongs to the age group of 36–45 years. The overall complication encountered is 12.5% in all the 56 repairs. All repairs showed excellent results from the 3<sup>rd</sup> and subsequent follow ups. There were no major complications during and after the repair. **Conclusion:** Thus, the tension free inguinal hernioplasty using a prosthetic mesh can confidently performed for all adult inguinal hernia to provide the benefits of less morbidity and excellent results to the patients. The surgeon should also avail the benefit of the simplicity of the procedure providing such excellent results.

**Keywords:** Inguinal hernia, hernioplasty, prosthetic mesh patch, recurrence, tension free repair

### INTRODUCTION

Inguinal hernia is one of the commonest problems requiring surgical intervention. This variant of hernia is more common in the males of our species. Twenty five percent of males and two percent of females will develop inguinal hernias in their lifetimes. Despite the frequency of surgical repair, perfect results continue to elude surgeons and the rate of surgical failure in humbling. To

overcome this, the surgical management of hernia has undergone extensive re-evaluation since the time of Celsus in the 1st century A.D. With the passage of time, surgeons all over the world have tried to perfect the Ultimate hernioplasty in recent times. Various techniques and variations have been under taken by surgeons in various centers so that a mind stretching variety of operations are available to the current day surgeons to deal with the problem of inguinal hernia.

However, the overall results of hernia repair are far from satisfactory with a high recurrence rate. The basic cause of this unacceptable situation is faulty technique on part of the surgeons leading to incomplete dissection and repair under tension. Tissues under tension have their blood circulation impaired with resultant ischemic necrosis. The tissue is thus weakened and recurrence occurs. The various methods of repair of hernia have their own pitfalls. However one aspect of hernia repair is agreed upon by all, that is the repair must not end in a recurrence and to avoid this ultimate failure, the consensus is to do a repair which is physiologically correct and without approximating tissue forcefully. Thus the surgeons have sought the ideal tensionless repair. Recognizing the lack in logic in repairing a hernia by placing together attenuated tissues under tension, Lichtenstein LL and colleagues demonstrated a tension free hernioplasty performed with a prosthetic mesh patch reinforcement sutured to the margins of defect with no attempt at forceful approximation.<sup>1</sup>

Lichtenstein LL et al continued their earlier report on using prosthetic mesh for hernioplasty in 1000 consecutive cases

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without recurrences.<sup>2</sup> Davies N et al observed that the tension free repair of inguinal hernia with a prosthetic mesh developed at the Lichtenstera Hernia Institute is reportedly less painful, allows rapid return to activity and carryind allow incidence of recurrence.<sup>3</sup> Gianetta et al reported no perioperative mortality and no recurrence.<sup>4</sup> Kark et al reported no recurrence in a 18 month to 5 year follow up of the primary inguinal hernia repairs using Lichtenstein patch repair.<sup>5</sup>

Recognizing that inguinal hernia repair is full of pitfalls, and keeping in view the opinions in favour of the tension free method, the present study was undertaken on the Lichtenstein method of hernia repair using prosthetic mesh patch. The aim of the study was to study the Lichtenstein prosthetic mesh tension free repair with respect to technique pitfalls and also the clinical presentation with respect to symptoms and signs and the indications/ contraindications for the procedure.

### MATERIALS AND METHOD

This study was undertaken in the six general surgical wards of Gauhati Medical College and Hospital, Guwahati, Assam for a period of one year. All the patients of age more than 25 years of age admitted in the surgical wards for hernia repair were included in the study. Of the total admission in the surgical wards, 158 inguinal hernia cases were examined and 52 cases of primary or recurrent inguinal hernia were selected for the study based on the inclusion and exclusion criteria. Patients under 25 years of age/ NYHUS type 1, patients with presence of obstruction/ strangulation /acuter admissions or with life threatening concomitant diseases, patient with associated femoral hernia, hydrocele or undescended testes were excluded from the study.

### RESULTS AND OBSERVATION

The age of patients in the present study ranged from 26 to 78 years and the median age was 50 years and the mean age was 48.86 years. All the patients (i.e., 100%) were males. Maximum of the patients (26.9%) were of the age group of 36 – 45 years.

The hernias were right sided in 22 patients, left sided in 26 patients and bilateral in 4 patients. The commonest symptom was a swelling in the groin and it was complained of by all patients (Table 1).

**Table 1** Side of Hernia and presenting complaints of the patients during admission

	No. of Patients (n= 52)	Percentage
<b>Affected Side of Hernia</b>		
Right	22	42.3
Left	26	50.0
Bilateral	4	7.7
<b>Complaints</b>		
Swelling in the groin	52	100
Mild to moderate pain	18	34.6
Irreducibility	12	21.4

The duration of swellings ranged from 2 to 30 months with a mean duration of 10.96 months and median of 9 months. On

examination, the extent of the swelling varied as shown in Table 2.

**Table 2** Duration and extent of swelling

	Number of Hernias (n=56)	Percentage
<b>Duration of Swelling (in months)</b>		
1- 10	30	53.6
11- 20	22	39.3
21 - 30	4	7.1
<b>Extent of Swelling</b>		
Bubunoccle	12	21.43
Funicular	18	32.14
Scrotal	26	46.43
<b>Hernias with Contents</b>		
Intestine	31	55.36
Omentum	17	30.36
Intestine + Omentum	8	14.28

A total of 31 (55.36%) hernias were found to contain intestine, 30.36% contained omentum and 14.28% were suspected of containing both intestine and omentum. The Deep ring occlusion test was positive for occlusion in 26 hernias, negative 21 hernias and not applicable on account of irreducibility in 9 hernias (Table 3).

**Table 3** Hernias with contents and results of deep ring occlusion test

	Number of Hernias (n=56)	Percentage
<b>Hernias with Contents</b>		
Intestine	31	55.36
Omentum	17	30.36
Intestine + Omentum	8	14.28
<b>Deep Ring Occlusion Test</b>		
Positive	26	46.4
Negative	21	37.5
Not Applicable	9	16.1

A total of 45 of the patients were operated under spinal anaesthesia and 7 patients were operated under general anaesthesia. All the four bilateral cases were operated under general anaesthesia. The operative findings showed that there were 31(55.36%) indirect, 17 (30.36%) direct and 8 (14.29%) combined hernias. These observations were in variance with the observations on clinical examination (Table 4).

**Table 4** Clinical and operative findings of the different hernias

Clinical Findings	No. of hernia	%	Operative Findings	No. of hernia	%
Indirect	26	46.4	Indirect	31	55.36
Direct	21	37.5	Direct	17	30.36
Ambiguous	9	16.1	Combined	8	14.29

The NYHUS classification was done to assess the posterior wall defects and it yielded that majority (42.85%) of the hernias were of type IIIB. Suction drain was used in 26 out of 56 hernia repairs i.e., 46.4% of repairs. The operating time after induction of anaesthesia ranged from 25 to 74 minutes with a mean operating time of 43.62 minutes and Median of 41 minutes. The operating time was between 25-34 minutes in 30.35% of repairs followed by 28.57% in the range of 45-54 minutes and 23.21% in the 35-44 minutes range. In 17.85% cases operating time was between 55-74 minutes. Analgesic injection (Dielofenac Sodium 75 mg) requirement postoperatively was in the range of 2-4 injections with a mean of 2.46 injections. The number of analgesic tablets (Nimesulide 100mg) was in the range of 4 to 10 tablets with a mean of 7.11 tablets.

The main early postoperative complications during postoperative hospital stay was urinary retention (3.57%) followed by scrotal swelling (1.79%) (Table 5).

**Table 5** Early post operative complications

Complications	Number of repairs (n=56)	Percentage
Urinary Retention	2	3.57
Scrotal Dermatitis	2	3.57
Scrotal Swelling	1	1.79
Cough	1	1.79

Scrotal dermatitis was due to skin contact with 5% Povidine Iodine during the septic and antiseptic preparation of the scrotum prior to operation. Cough developing postoperatively was similarly a non specific complaint unrelated to hernia repair. Exclusion of these 3 non specific condition resulted in 3 total early postoperative complication with a rate of 5.35%.

The post-operative hospital stay ranged from 2-5 days with a mean of 2.78 days. The return to normal activity period across the whole group ranged from 7 to 21 days with a mean of 12.96 days. In the 1st follow up (i.e., 8<sup>th</sup> post-operative day), 91.07% repairs showed excellent results. Only 5 complications were reported, of which 2 patients had pain and one each had scrotal swelling, seroma and infection. At the end of one month excellent results were obtained in 98.21% of the repairs. There was one complication in the form of pain which carried over from the 1<sup>st</sup> follow up. All repairs showed excellent results from the 3<sup>rd</sup> and subsequent follow ups. The overall complications rate in the follow up was 8.92%. On including the early post operative complications, the total complication encountered in this series tension free repair was 12.5%. No recurrence was noted during the period of follow up.

## DISCUSSION

The age of the patients in the present study ranged from 26 to 78 years with a median age of 50 years, which is in accordance with the findings of Amid et al.<sup>6</sup> In the present study inguinal hernia was more common in males (100%). The male preponderance is similar to the findings of Capozzi et al<sup>7</sup>, Amid et al<sup>6</sup> and Wantz<sup>8</sup>. The major complaint complained of by the patients was swelling in the groin (100%). 32.14% of the patients complained of mild

pain in the groin area. These two symptoms were the most frequent complaints encountered in the present study.

In the present series, most of the patients (92.3%) had unilateral hernia. Davies et al<sup>3</sup>, Capozzi et al<sup>7</sup> and Kark et al<sup>5</sup> also reported similar findings in their studies. In the present study, out of the total 56 hernias, majorities (55.36%) were indirect inguinal hernias followed by direct hernias (30.36%) and combined hernias (14.29%). These findings corroborates with the findings of Capozzi et al<sup>7</sup>, Amid et al<sup>9</sup>, Wantz<sup>8</sup>, Prywinski et al<sup>10</sup> and Kark et al.<sup>5</sup>

In the present series of repairs operations were done under spinal or general anaesthesia and incision extended as and when required. Indirect sacs were dissected out, excised and transfixation ligature applied. Direct sacs, if large were inverted by a purse string suture. Next a Prolene (polypropylene) mesh of 5 inch x 3 inch size was trimmed and sutured the edges of the canal floor without tension. A slit in the lateral end of the mesh allowed the emergence of the spermatic cord. A suction drain was given in some cases where deemed necessary. The external oblique aponeurosis and skin were closed in layers. Similar procedure was also reported by the other authors in their studies.

Amid et al<sup>11</sup> reported using a 8x16 cms precut mesh trimmed by 102 cms resulting in 6x8 cms wide patch. We have used a 3x5 inch i.e. 7.5x12.5 cms prolene mesh suitably trimmed to around 6x8 cms to overlap the inguinal floor on all sides. Shulman et al<sup>12</sup> reported placing the mesh between the two oblique muscles and recommended it for tension free hernioplasties. Amid et al<sup>6</sup> stressed on the need to overlap the mesh at the pubic bone and employing a wide patch of mesh to provide an appropriate degree of laxity. Similar to the findings of the present study, Amid et al<sup>13</sup> also reported the use of suction drain. Though the suction drain increased post operative hospital stay, it is useful in preventing post operative hematoma and subsequent infection.

The operating time, after the induction of anaesthesia, in the present series ranged from 25 minutes to 74 minutes with a mean operating time of 43.62 minutes which varied with the findings of the other literatures. The post operative analgesic requirements in the present series were a median of 2 injections of Diclogenac Sodium 75 mg and 6 tables of Nimesulide tablets 100mg. Davies et al<sup>3</sup>, Amid et al<sup>6</sup> and Kark et al<sup>5</sup> also reported the need of analgesic in their studies.

The present study revealed that the return to normal activity across the whole group ranged from 7 to 21 days with a mean of 12.96 days and a median of 12 days, which is in accordance with the findings of Amid et al<sup>11</sup>, Davies et al<sup>3</sup> and Kark et al.<sup>5,14</sup>

In the present series there were a total of 7 complications, all minor, in 56 Lichtenstein tension free repairs. There was 1(1.79%) case of scrotal swelling in the early post operative period. There were also 2 (3.57%) cases of urinary retention in the early post operative period. There was one seroma (1.79%) which resolved spontaneously on conservative treatment. One case of infection represent as a stitch abscess. Two cases of prolonged pain subsided on conservative treatment and there was no residual neuralgia. There were no recurrences, no testicular atrophy or chronic residual neuralgia, no mesh rejection or frank infection

requiring mesh removal. All cases showed excellent results at the end of the follow up period. These findings corroborate with the findings of Davies et al<sup>3</sup>, Kark et al<sup>5,14</sup>, Amid et al<sup>6</sup>, Velitchkov et al<sup>15</sup>, Wantz<sup>8</sup> and Prywinski.<sup>10</sup>

There were no major complications like chronic residual neuralgia, testicular atrophy, frank infection, mesh rejection and there was no recurrence. Thus, the procedure was well tolerated, highly safe and highly effective with no failures as evaluated in the present series.

#### CONCLUSION

Inguinal hernia is more common in the males of our species and affects the young and old alike. The inguinal hernias in the adult patients are repaired by various methods of sapphires and plastics. However one aspect of hernia repair is agreed upon by all, that is the repair must not end in a recurrence and to avoid this ultimate failure, the consensus is to do a repair which is physiologically correct and without approximating tissue forcefully.

Thus, the tension free inguinal hernioplasty using a prosthetic mesh as outlined by Lichtenstein can confidently performed for all adult inguinal hernia to provide the benefits of less morbidity and excellent results to the patients. The surgeon should also avail the benefit of the simplicity of the procedure providing such excellent results.

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