

## Original Research Article

# An evaluation of efficacy of Lichtenstein mesh hernioplasty in emergency settings: a study in tertiary care hospital in Odisha

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## ABSTRACT

**Background:** Despite the high incidence, the technical aspects of hernia repair continue to evolve making it the most common operations performed by general surgeons. Lichtenstein mesh hernioplasty repairs all hernias without distortion of the normal anatomy and with no suture line tension. This study was performed to evaluate the outcomes of Lichtenstein mesh herinioplasty in emergency inguinal hernia patients.

**Methods:** A 84 patients were operated for complicated (obstructed irreducible) inguinal hernia. A follow-up period of 6 months using the Quantitative and Qualitative Measurement Instrument for evaluation of Lichtenstein hernioplasty outcomes was completed for 44 emergency patients.

**Results:** The age incidence of the hernia patients in the study group was 40% (25-35 years) followed by 24% (15-25 years). The anatomical position of the hernia in the study group was to the right having a dominant percentage of 72% followed by left (24%) with none in bilateral. Early postoperative complications in mesh repair (Lichtenstein hernioplasty) comprising of factors like wound infection (10%), hematoma (5%), seroma (10%) was significantly lower compared to tissue repair with wound infection (20%), hematoma (5%) and seroma (25%). Further mesh rejection in Lichtenstein hernioplasty was 0% for the study population. Similarly, late postoperative complications in Lichtenstein hernioplasty comprising of factors like wound dehiscence (4%), neuralgia (27%) was significantly lower compared to tissue repair with wound dehiscence (27%), neuralgia (41%).

**Conclusions:** The study revealed that the use of polypropylene prosthesis in the emergency setting (obstructed hernia) is safe and outcomes are satisfactory.

**Keywords:** Hernia, Lichtenstein mesh herinioplasty

## INTRODUCTION

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity. The external abdominal hernia is the most common form, the most frequent varieties being the inguinal, femoral and umbilical, accounting for 75% of cases. A hernia is reducible when its contents can be

replaced within the surrounding musculature and it is irreducible or incarcerated when it cannot be reduced. A strangulated hernia has compromised blood supply to its contents, which is a serious and potentially fatal complication. An external hernia protrudes through all layers of the abdominal wall, whereas an internal hernia is a protrusion of intestine through a defect within the peritoneal cavity. An interparietal hernia occurs when the

hernia sac is contained within a musculoaponeurotic layer of the abdominal wall. Inguinal hernias are classified as either direct or indirect. The sac of an indirect inguinal hernia passes from the internal inguinal ring obliquely toward the external inguinal ring and ultimately into the scrotum. In contrast, the sac of a direct inguinal hernia protrudes outward and forward and is medial to the internal inguinal ring and inferior epigastric vessels.

The surgical repair of the inguinal hernia is the most common general surgery procedure performed today.<sup>1</sup> Despite the high incidence, the technical aspects of hernia repair continue to evolve. Bassini revolutionized the surgical repair of the groin hernia with his novel anatomical dissection and low recurrence rates (5 recurrences in over 250 patients).<sup>2</sup> Bassini's repair emphasizes both the high ligation of the hernia sac in the internal ring, as well as suture reinforcement of the posterior inguinal canal.

The operation utilizes a deep and superficial closure of inguinal canal, repaired by interrupted sutures affixing the transversalis fascia medially to the inguinal ligament laterally. The advances in groin hernia repair in the century following Bassini have shared the primary goal of reducing long term hernia recurrence rates. To this end, efforts have been directed at developing a repair that imparts the least tension on the tissues that are brought together to repair the hernia defect.

The prime etiologic factor behind most herniorrhaphy failures is the suturing together, under tension, of structures that are not normally in apposition. With the use of modern mesh prosthetics, it is now possible to repair all hernias without distortion of the normal anatomy and with no suture line tension. The technique is simple, rapid, less painful, and effective, allowing prompt resumption of unrestricted physical activity.

Modern mesh prosthetics have been widely used in surgery for the past 30 years. Polypropylene (Prolene Mesh<sup>®</sup>) is strong, monofilamented, inert, and readily available; it is unable to harbor infection, is very thin and porous, its interstices become completely infiltrated with fibroblasts and remain strong permanently, it is not subject to deterioration or rejection, and it cannot be felt by patient or surgeon postoperatively.<sup>3,4</sup>

There are five key elements of Lichtenstein tension free hernioplasty based on i) the physiodynamic characteristics of the abdominal wall and intraabdominal pressure gradient, which rises from 8 cm of water, with the subject supine, to more than 80 cm of water on physical exertion, resulting in forward protrusion of the transversalis fascia; and ii) shrinkage of the mesh in vivo, which according to the clinical studies published in 1997 and confirmed by other investigators, is approximately 20%. Taking the above factors we decided to evaluate the outcomes of mesh herinioplasty in emergency inguinal hernia patients.

Objectives of the study as follow

- To study the response of mesh hernioplasty in emergency setting (obstructed hernia).
- To compare the outcomes of tissue repair with mesh repair.
- To study the response of wound healing.
- To compare the post-operative complications between elective and emergency inguinal mesh hernioplasty.

**METHODS**

**Inclusion criteria**

- Patients presenting with obstructed hernia for not more than 24 hours, presenting to Emergency department of SCB Medical College, Cuttack, Odisha.
- Patients presenting with non-strangulated/non obstructed uncomplicated reducible hernia presenting to out-patient department of SCB Medical College, Cuttack, Odisha.

**Exclusion criteria**

- Age <15 years >65 years.
- Patients in shock
- Recurrent inguinal hernia.
- Strangulated hernia.

From May 2012 to May 2014, 84 patients were operated for complicated (obstructed irreducible) inguinal hernia. A follow-up period of 6 months using the Quantitative and Qualitative Measurement Instrument for evaluation of Lichtenstein hernioplasty outcomes was completed for 44 emergency patients.<sup>3</sup>

**RESULTS**

The age incidence of the hernia patients in the study group was 40 % (25-35 years) followed by 24% (15-25 years) (Table 1).

**Table: 1 Age incidence in hernia patients.**

Age (years)	Incidence (%)
15 - 25	24
25 - 35	40
35 - 45	11
45 - 55	13
55 - 65	12
Total	100

The anatomical position of the hernia in the study group was to the right having a dominant percentage of 72 % followed by left (24%) with none in bilateral (Table 2).

**Table: 2 Anatomical position of hernia.**

Anatomical Position	Number	Percentage (%)
Right	64	72
Left	24	28
Bilateral	0	0
Total	88	100

Early postoperative complications in mesh repair (Lichtenstein hernioplasty) comprising of factors like wound infection (10%), hematoma (5%), seroma (10%) was significantly lower compared to tissue repair with wound infection (20%), hematoma (5%) and seroma (25%) (Table 3). Further mesh rejection in Lichtenstein hernioplasty was 0% for the study population.

Similarly, late postoperative complications in Lichtenstein hernioplasty comprising of factors like wound dehiscence (4%), neuralgia (27%) was significantly lower compared to tissue repair with wound dehiscence (27%), neuralgia (41%) (Table 4). For emergency patients, the period of hospitalization was longer than for elective patients because they suffered proportionally more postoperative complications.

**Table 3: Early postoperative complications in mesh and tissue repair (<7 days).**

Type of complication	Number		Percentage (%)	
	Mesh repair	Tissue repair	Mesh repair	Tissue repair
Wound infection	4	17	10	20
Hematoma	2	04	5	5
Seroma	4	22	10	25
Mesh rejection	0	-	0	-

**Table 4: Late postoperative complications in mesh and tissue repair (>7 days).**

Type of complication	Number		Percentage (%)	
	Mesh repair	Tissue repair	Mesh repair	Tissue repair
Wound dehiscence	2	12	4	27
Neuralgia	12	18	27	41

## DISCUSSION

Despite the fact that Lichtenstein hernioplasty constitutes the current gold standard for the elective repair of inguinal hernia in men, the application of this technique for emergency surgery has not been widely accepted due to many factors influencing the decision to use or not prosthesis in this setting. The results from several meta-analysis have shown that the use of mesh is better to the non-mesh repairs in inguinal hernia surgery. The properties of ideal prosthetic material were described by Cumberland.<sup>5</sup> In complicated hernias with obstruction,

recent publications show that mesh is safe, and it does not increase infection risk.

Recurrence of the hernia in the early postoperative setting is rare. When this does occur, it is often secondary to deep infection, undue tension on the repair, or tissue ischemia. Tension is an important if not primary, etiology of hernia occurrence. Tissues repaired under undue tension will tend to pull apart, even if sutures or mesh have been affixed to them. In addition, tension at the site of suture may lead to ischemia at the point where the suture pulls against the tissue, thereby further weakening the hernia repair. The role of excessive tissue tension in promotion of hernia recurrence is the basic rationale behind the modern tension free and increasingly suture free hernia repairs advocated by hernia experts such as Lichtenstein.

The size of the hernia defect is proportional to the risk of hernia recurrence. Large hernias have an increased rate of recurrence postoperatively. This is most likely due to the nature of the surrounding fascial tissues that are critical to the strength and reliability of the repair. An emergency operation for strangulated or incarcerated hernia may increase the risk of postoperative recurrence.

Infection of the hernia wound, or mesh is an uncommon postoperative complication but represents another etiology of hernia recurrence; incidence of wound infection following inguinal hernia operation is 1% or less. Even if the mesh is present most postoperative groin hernia infections are treated with aggressive use of antibiotics after the incision is opened and drained expeditiously.<sup>6</sup>

Seromas form in the dead space remaining from a wide dissection during hernia repair or when fluid fills the distal remnant of the hernia sac. Seroma etiology remains unknown, but it seems to be due to a local inflammatory response to a mechanical injury incurred by tissue aggression during surgery and the presence of foreign bodies.<sup>7</sup> Defined fluid collections infrequently require drainage or aspiration, as most will reabsorb or drain through the incision on their own.

Hematoma formation must be assiduously avoided during groin hernia repair. This is especially true in the anticoagulated patient and therefore it is recommended that patients temporarily stop taking aspirin and clopidogrel at least 1 week prior to operation. Hematoma formation may be minor and lead only to ecchymoses and wound drainage. The ecchymosis often spreads inferiorly into the scrotal plane in a dependant fashion. The hematoma usually resolves in days to weeks following repair and supportive management for pain control including scrotal elevation and warm packs.

Postoperative groin pain or neuralgia, is common to varying degrees following groin hemiorrhaphy.<sup>8</sup> Neuralgia follows the known distribution of the regional

nerve, including the ilioinguinal, iliohypogastric, genital branch of the genitofemoral nerve, and the lateral femorocutaneous nerves. During open hernia repair, the ilioinguinal, iliohypogastric, and the genitofemoral nerves are most commonly injured, while the lateral femorocutaneous nerve is most commonly injured during laparoscopic herniorrhaphy.<sup>9</sup> Neuralgias are prevented by meticulously avoiding overt manipulation of the nerves during operative dissection. The ilioinguinal and iliohypogastric nerves are generally injured during elevation of the external oblique fascial flaps, while the genitofemoral nerve is most likely to be injured during the isolation of the cord and stripping of the cremaster muscle fibres. Once the nerve branches are identified, they are encircled with a vessel loop and retracted out of the operative field to avoid injury. Neuralgia is managed first conservatively, with attempts at local anesthetic injection in the affected groin. When local anesthesia is injected along the known course of a nerve, this modality may serve as both a diagnostic and therapeutic maneuver. Upon the failure of conservative approach, groin re-exploration is performed to ligate or excise affected nerve branches. This is clearly not the preferred first option, since the groin wound has abundant scar and previously undamaged nerve structures may be placed at additional risk.<sup>10</sup>

The urinary bladder may be inadvertently injured during dissection of a direct inguinal hernia sac, but only rarely during repair of an indirect defect.<sup>11</sup> The bladder can also participate in a sliding hernia, so that a portion of the bladder wall is adherent to the sac in a direct defect. If bladder injury takes place, the sac should be opened, and the bladder injury repaired in two layers of an absorbable suture.

Testicular swelling and atrophy is seen after inguinal hernia repair. Edema of the scrotum or testis may be secondary to edema or hematoma of the inguinal canal and tracks inferomedially to the scrotum in a dependent fashion. Alternatively, a tender testicle or an atrophic testicle may be secondary to injury to the blood supply to the genitals during dissection and isolation of the cord. In most cases this is not an emergency in the adult patient, and the testes will atrophy without significant infectious complications so that orchiectomy is rarely necessary. A testicle that is tender on examination may require ultrasonographic imaging to rule out testicular torsion or a corresponding abscess.

## CONCLUSION

The study revealed that the use of polypropylene prosthesis in the emergency setting (obstructed hernia) is safe and outcomes are satisfactory. Further it demonstrated that the outcomes of emergency Lichtenstein hernioplasty were similar to the outcomes of elective Lichtenstein hernioplasty. The outcomes of Lichtenstein hernioplasty were very good in 96% of

elective patients and in 88 % of emergency patients in comparison to tissue (Bassini) repair.

Finally, tension-free repair with polypropylene mesh in obstructed hernia, has an advantage in terms of seroma formation, hospital stay, especially without resection with anastomosis or perforation.

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