

**A Comparative Study on Self-Gripping Mesh vs. Polypropylene Mesh in Lichtenstein's Open Inguinal Hernioplasty**N Durga Prasad<sup>1</sup>, Kamadi Ramarao<sup>2</sup>, P. Anusha<sup>3</sup>, K. Sailaja<sup>4</sup><sup>1</sup>Associate Professor, Department of General Surgery, Government Medical College, Eluru.<sup>2</sup>Associate Professor, Department of General Surgery, Government Medical College, Eluru.<sup>3</sup>Assistant Professor, Department of General Surgery, Government Medical College, Eluru.<sup>4</sup>Associate Professor, Department of General Surgery, Rangaraya Medical College, Kakinada.

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Conflict of interest: Nil

**Abstract****Introduction:** Inguinal hernia (IH) stands out as one of the most prevalent conditions in society. The present study was taken with an aim to compare postoperative pain (POP) and operation time undergoing Lichtenstein's tension free IH repair with self-fixating mesh with conventional polypropylene mesh.**Methods:** It was a prospective research conducted in government Medical College, Eluru. Study was conducted for a period of 8 months, from July to October 2021. Study protocol was approved by Institutional ethical committee. An informed written consent was taken from all the study participants. The study included patients of both gender, >18 years with uncomplicated IH visited department of general surgery and underwent open Lichtenstein Hernioplasty (LH) were included. The patients were categorized into the study group, underwent hernioplasty with self-gripping mesh and the control group with polypropylene mesh using traditional suturing as per the protocol. The surgical procedures were performed by a single surgeon on both groups. Chi-square test was used for statistical analysis and P < 0.05 were considered to be statistically significant.**Results:** Total 113 members were included, 55 and 58, respectively in study and control group. Gender wise statistically there was no significant difference between the groups. The mean time for the procedure was 31.2±4.35 and 41.6±5.1 mins, respectively for the groups; statistically there was significant difference between the groups in mean time (t value = -13.71; P<0.001). The median pain score was 0 for the study group and 2 for the control group; statistically there was significant difference (Z score = 6.223; P<0.002).**Conclusion:** The use of self-fixating mesh proved effective in minimizing POP and reducing operating time in patients undergoing Lichtenstein's tension-free IH repair, as compared to conventional polypropylene mesh. Additionally, the self-adhesive mesh demonstrated comparable efficacy to conventional polypropylene mesh in preventing hernia recurrences among patients undergoing Lichtenstein's tension-free IH repair.**Keywords:** repair, hernia, significant, patient

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**Introduction**

Inguinal hernia (IH) stands out as one of the most prevalent conditions in society, and its repair methods have been thoroughly documented throughout history. The inguinal canal, a tubular structure, houses the round ligament in females and the spermatic cord in males, running in an inferomedial direction. [1] The processus vaginalis, an extension of the peritoneum, is connected to the testis and descends retroperitoneally into the scrotum. The occurrence of an IH arises when the processus vaginalis does not undergo proper obliteration. [2]

Tension-free repairs have been established as the gold standard for hernia repairs, with postoperative

pain presenting as a primary challenge. Abdominal wall hernias result from the displacement of intra-abdominal organs, stemming from the separation of abdominal wall muscles, fascial layers, mesentery, or surrounding organ structures. Inguinal hernias, among the most prevalent abdominal wall hernias, manifest in both inguinal and femoral regions and are frequently grouped together. Constituting 75% of abdominal wall hernias, groin hernias are more prevalent in 27% of men compared to 3% of women; IH repairs are conducted in 90% of men and 10% of women. [1]

With this background, the present study was taken with an aim to compare postoperative pain (POP)

and operation time undergoing Lichtenstein's tension free IH repair with self-fixating mesh with conventional polypropylene mesh.

#### Methods:

It was a prospective research conducted in government Medical College, Eluru. Study was conducted for a period of 8 months, from July to October 2022. Study protocol was approved by Institutional ethical committee. An informed written consent was taken from all the study participants. The study included patients of both gender, >18 years with uncomplicated IH visited department of general surgery and underwent open Lichtenstein Hernioplasty (LH) were included in the research. Excluded from the study were individuals with complicated IH (obstruction or strangulation), those with recurrent IH, individuals undergoing the procedure under general anesthesia, and those not willing to participate in the study.

After recruiting the participant in the study, detailed clinical history was collected. All the findings were recorded in the study proforma. The study was clearly explained in the local language. The participants were allowed to ask doubts. After clarifying all the doubts beyond the knowledge attempted for blood sample collection and parameters were analysed as per the protocol. If the blood parameters are in normal limits, hernia repair is carried. The patients were categorized into two groups: the study group underwent hernioplasty with self-gripping mesh and the control group with polypropylene mesh using traditional suturing.

Under spinal anesthesia (SA) and stringent aseptic conditions, patients in both groups underwent open LH. Following the completion of basic dissection, sac delineation, and content reduction, the study group, receiving the self-gripping mesh, had it

positioned on the posterior wall without the need for a single suture, including any that might have been required for the medial border. Additionally, a medial cover of two centimeters was ensured. In contrast, the control group underwent conventional mesh fixation techniques. The surgical procedures were performed by a single surgeon on both groups. Subsequent to surgery, patients were monitored in the ward until discharge, with follow-ups conducted at three and six months to assess various parameters and at one year to check for recurrence. Any complications were treated as necessary, and comprehensive investigations were carried out.

#### Statistical Analysis:

The data were analysed using SPSS version 21. It was presented in mean and percentage. Chisquare test was used for statistical analysis and  $P < 0.05$  were considered to be statistically significant.

#### Results:

Total 113 members were included, 55 and 58, respectively in study and control group. Gender wise, 92% (104) were male and 8% (9) were female participants; gender wise statistically there was no significant difference between the groups (Table 1). In the study group, for maximum (20.1%; 23) members 30 mnts time period was required for the procedure whereas for the control group it was 35 mnts (25.7%; 29); time period wise, statistically there was significant difference between the groups (Table 2). The mean time for the procedure was  $31.2 \pm 4.35$  and  $41.6 \pm 5.1$  mints, respectively for the groups; statistically there was significant difference between the groups in mean time ( $t$  value = -13.71;  $P < 0.001$ ). The median pain score was 0 for the study group and 2 for the control group; statistically there was significant difference ( $Z$  score = 6.223;  $P < 0.002$ ).

**Table 1: Gender wise distribution of the study members; n (%)**

Gender	Study group	Control group	Total
Male	51 (45.1)	53 (47)	104 (92)
Female	4 (3.5)	5 (4.4)	9 (8)
Total	55 (48.7)	58 (51.3)	113 (100)
Statistical analysis	$\Psi^2$ value with yates correction= 0.0069; P value = 0.933812		
	Statistically not significance		

**Table 2: Distribution of study members according to the operating time in mnts; n (%)**

Time	Study group	Control group	Total
25	12 (10.6)	2 (1.8)	14 (12.4)
30	23 (20.1)	4 (3.4)	27 (23.8)
35	15 (13.3)	29 (25.7)	44 (39)
40	5 (4.4)	23 (20.4)	28 (24.7)
Total	55 (48.7)	58 (51.3)	113 (100)
Statistical analysis	$\Psi^2$ value= 36.4853; P value = 0.0021		
	Statistically significance		

### Discussion:

The challenges and opportunities for improvement in the field of medicine persist in the context of IH and its repair. The placement of mesh on the posterior wall of the inguinal canal, with a medial cover extending approximately two centimeters medial to the pubic tubercle, is a common practice. Drawing from literature reviews and collective experiences, we assert that mesh fixation may be circumvented, potentially averting numerous adverse complications. [5, 6]

Gender wise, statistically there was no significant difference (Table 1). Male predominance was reported in the studies. [2] This indicates IH is common among the male. In this study, statistically there was significant difference between the groups in the POP. Minimizing tension during mesh fixation and ensuring the closure of the flap around the cord have been associated with a reduction in POP. [7, 8] In the polypropylene group, the tension generated by sutures and the local tissue inflammation and edema resulting from mesh suturing are observed to contribute to increased POP. [1, 9] The self-gripping mesh, with its gripping fixation, securely attaches the entire mesh to the posterior wall. Notably, none of the patients reported chronic pain three months after the surgery. As per the literature, use of self-fixing mesh was associated with reduced POP during the early days following the procedure. [10]

To prevent complications associated with IH, it is imperative to promptly proceed with inguinal hernioplasty, avoiding any unnecessary delays. In the study group, for maximum (20.1%; 23) members 30 mnts time period was required for the procedure whereas for the control group it was 35 mnts (25.7%; 29); time period wise, statistically there was significant difference between the groups (Table 2). The mean time for the procedure was  $31.2 \pm 4.35$  and  $41.6 \pm 5.1$  mints, respectively for the groups; statistically there was significant difference between the groups in mean time ( $t$  value = -13.71;  $P < 0.001$ ). The literature also indicates a shorter operative time with self-gripping mesh when compared to polypropylene mesh. The majority of meta-analyses have consistently demonstrated a clear advantage in terms of operating time when employing self-adhesive mesh for hernia repair. [11 – 13]

The use of self-fixating mesh proved effective in minimizing postoperative pain and reducing operating time in patients undergoing Lichtenstein's tension-free IH repair, as compared to conventional polypropylene mesh. Additionally, the self-adhesive mesh demonstrated comparable efficacy to conventional polypropylene mesh in preventing hernia recurrences among patients undergoing Lichtenstein's tension-free IH repair.

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