

**INGUINAL HERNIA SURGERY UNDER LOCAL ANAESTHESIA, AS DAY CARE SURGERY AND COMPARISON AMONG THREE GROUP OF PATIENTS CLASSIFIED ACCORDING TO TYPE OF MESH USED**Arvind Shukla<sup>1</sup>, Arif Ahmed Ansari<sup>2</sup>, R. K. Mathur<sup>3</sup>, Anupam<sup>4</sup>**HOW TO CITE THIS ARTICLE:**

Arvind Shukla, Arif Ahmed Ansari, R. K. Mathur, Anupam. "Inguinal Hernia Surgery under Local Anaesthesia, as Day Care Surgery and Comparison among Three Group of Patients Classified According to Type of Mesh Used". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 45, June 04; Page: 7719-7726, DOI: 10.14260/jemds/2015/1124

**ABSTRACT: BACKGROUND:** Inguinal hernia repair is one of the most commonly performed operations worldwide. This study was done to evaluate, local anesthesia as choice of procedure for inguinal hernia as day care surgery including both regular & comorbidity associated patients, to know which mesh is suitable smallpore (Heavy weight) or largepore (Light weight) and to know if use of absorbable suture is better than non-absorbable suture for fixation of mesh. **METHODS:** We prospectively studied 69 patients with a primary unilateral inguinal hernia. The study group was randomized to Lichtenstein repair after taking full informed consent. Pain was assessed by visual analogue scale, Quality of life was assessed by responses to a health questionnaire administered to post-operative patients. **RESULTS:** The highest contraction rate was found in polypropylene small pore mesh (28.76%), followed by polypropylene large pore mesh (23.9%) and the least contraction seen in knitted composite mesh (17.2%). Quality of life was assessed at 1 month and 3 month have shown significant difference among three groups. **CONCLUSION:** Most of the inguinal hernia surgery can be carried out smoothly in local anesthesia, as day care procedure. It is choice of procedure also in patients with comorbidity. Use of absorbable suture for Lichtenstein hernia repair did not affect recurrence rate. Quality of life is better with knitted composite group, than pp large pore group, than Polypropylene small pore mesh.

**KEYWORDS:** large pore and small pore mesh, quality of life, absorbable suture, co-morbidity.

**INTRODUCTION:** Inguinal hernia repairs consume an important part of health care resources because of the high incidence of the problem. It is estimated that 20 millions of inguinal hernia repairs are performed globally every year.<sup>1</sup> Despite the high incidence, the technical aspects of hernia repair continue to evolve. However, the best choice of anesthesia for hernia repair is still not universally fixed. Several retrospective and randomised controlled trials have shown that local anesthesia provides the best clinical and economic benefits to patients. There is still no consensus about the best choice of anaesthesia, and type of mesh used. Local anesthesia is preferred at most centres where there is a special interest in hernia repair.

In other settings, such as general surgical units, regional or general anaesthesia is more often used. Hernia repair done with local anaesthesia is supposed to require greater expertise and surgical skill and is, therefore, only successful if the surgeon is thoroughly familiar with the technique. This study aimed to analyse the outcomes of inguinal hernia repair under local anesthesia as a day care procedure in M Y Hospital Indore with special emphasis on the use of absorbable suture to fix the mesh. In study done by Parviz K Amid & Alex. G. Shulman.<sup>2</sup> It was concluded that preferred choice of anesthesia for all reducible adult inguinal hernia repair is local. In study done by S. Bringman, S.

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Wollert, it was concluded that use of light weight mesh for Lichtenstein hernia repair did not affect recurrence rates, but improved some aspects of pain and discomfort 3 years after surgery.<sup>3</sup>

**MATERIALS AND METHODS:** A prospective study of 69 patients undergoing hernioplasty was done after proper institutional ethical clearance and informed consent of the patients.

**Inclusion Criteria:** The analysis was based on surgical patients in age group of 18-70 years diagnosed with inguinal hernia registered in our study.

Patients with bilateral, recurrent, or incarcerated inguinal hernia were excluded from the study.

Study subjects were assigned to three groups according to mesh used (Considering the pore size, & weight) and randomized by using simple random number table.

Point block technique was used for local anesthesia infiltration. Lignocaine 2% with adrenaline in 1:200000 dilution, and Bupivacaine 0.5%.

3 different types of mesh were used in our study: Polypropylene small pore mesh (pore size. 6.7mm, wt. 105-115gms), Knitted composite mesh (pore size 1.5-2mm, wt.90-100gms) & polypropylene large pore mesh (pore size 2-3mm, wt. 70-80gms). For group I patients polypropylene small pore mesh, for group II patients knitted composite mesh & for group III patients polypropylene large pore mesh was used.

**STATISTICAL METHODS APPLIED:** The result were analysed on SPSS version 21 using ANOVA test.

**RESULT: In our Study:**

1. Most of our patients were manual worker and were advised no heavy wt. lifting for 2 weeks. Patients returned to work on an average after 18 days, 22 days in group I, and 13.5 days in group II & 18 days in group III.
2. Local anesthesia was used in our study in doses much lower than safe dose, though total amount of anesthetic agent was comparable to other studies, bupivacaine was used in much lower dose.
3. 2 patients in each group i.e., 6(8.7%) patients in our study, were having pain intra-operatively, which was relieved by further infiltration of LA. 2 patients needed sedation.
4. At the end of procedure no patients were having pain.
5. Seroma was present in only 1pt i.e., 4.34%, there was no complication of urinary retention, superficial or deep mesh infection.
6. There was 1 patient who presented with recurrence in follow up till now, that too presented within 1 month of surgery and thought to be due to suboptimal technique.
7. Fibrosed mesh was visible in high frequency USG, polypropylene small & polypropylene large pore mesh were visible in MRI while knitted composite mesh was not visible in MRI. Visibility of mesh was better in USG as compared to MRI.

Contraction of polypropylene small pore mesh was highest, next was polypropylene arge pore mesh and least contraction of knitted composite mesh was observed in our study. At 1 month mean contraction was 24% in PP small pore group, 18% in knitted composite & 15% in PP large pore group.

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On follow up at 3 month mean contraction was 28.76% in PP small pore group, 17.2% in knitted composite & 23.9% in PP large pore group.

8. Foreign body sensation was present in patients in following order: 17 patients (74%) in pp small pore mesh>in 2 patients (52.17%) pp large pore mesh>9 patients (39.1%) in knitted composite mesh. Postoperative pain present in patients in following order: 17 patients (74%) in pp small pore mesh > in 9 patients (39.13%) pp large pore mesh>14 patients (60%) I knitted composite.

Quality Of Life assessed at 1 month and 3 month have shown significant difference among 3 groups.

**DISCUSSION:** The Lichtenstein tension-free mesh repair is currently one of the most popular open inguinal hernia repair techniques by using non-absorbable polypropylene sutures mostly.

We gave a thought of using absorbable polyglycolic acid sutures. There is still no consensus about the type of mesh use. We have tried to compare 3 different type of mesh in our study. Local anesthesia used in all cases except 1 which is not considered in study.

**As Day Care Surgery:** Day care surgery has been recently gaining popularity owing to the increasing constraints on public-sector health care resources.

Early post-operative mobilisation results in lesser morbidity and, hence, early discharge from hospital. Study done by H Lau suggests that patients operated under L/A start physical activity earlier after surgery. Callese also proves in his study that L/A facilitates the faster mobilisation and early discharge from hospital than the other anaesthetic techniques.<sup>4</sup>

**Local Anesthesia:** All patients taken for the study were comfortable in the intra operative period except 3 patients. Two patients needed sedation because of pain and in 1 patient, it was needed to convert into GA, because it was difficult to reposit bowel back, as patient was straining. In our study local anesthesia infiltrated by operating surgeon without need of anesthetist, but as it was performed in an institute, anesthetist were available on call. We used on an average 46.2 ml & 5 ml Lignocaine with adrenaline & Bupivacaine respectively. Total volume of anesthetic agent used is comparable to other studies but volume of long acting local anesthetic used is less than other studies.

In study done by Hannu Paaajanen local infiltration anaesthesia was a 1:1 mixture of bubivacaine (Marcain 5mg/ml, Astra Zeneca) and Citanest-adrenalin (10mg/ml+5µg/ml, Astra Zeneca) with an average total volume of 40-50ml.<sup>5</sup>

**Analgesic:** One ampule (30mg) diclofenac, or one ampule (100mg) tramadol were used during the surgical procedure. 2.8% patients needed sedation due to pain, one ampule (10mg), diazepam or fentanyl had been given to these patients. This is comparable to study done by Patrick J. O'Dwyer, MD, FRCS,\* Michael G. Serpell.<sup>6</sup> It was observed that, these are young anxious patients.

In our study 13x6 cm mesh was used, which was optimum for average built Indian patients. Size is comparable to mesh used in study done by Hannu Paaajanen.<sup>5</sup>

We used absorbable polyglycolic acid suture to fix the mesh similar to study done by Hannu Pajannen.<sup>5</sup> There is no increased recurrence rate when absorbable suture was used to fix the mesh in our study. Recurrence is in 1 patient. Urinary retention or infection was not found in any of the patients postoperatively. Rate of recurrence in our study is similar to study done by Hannu Paaajanen.<sup>5</sup> In ten-year audit of Lichtenstein hernioplasty under local anaesthesia by Hannu Paaajanen and Riitta Varjo: The incidence of recurrence was 2.1% during the 10 years follow-up.

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In United States, the results of specialist clinics have been encouraging, for example-recurrences between 0 and 1% and infections between 0 and 5% have been reported.<sup>7</sup>

**Time Span of Operation:** Operative time was recorded from infiltration of local anaesthetic to skin closure. In present study the mean operative time was 43.18 minutes. The results of our study were similar to the other studies conducted by Song et al (2000),<sup>8</sup> Job C et al (1979)<sup>9</sup> and Young DV (1987).<sup>10</sup>

**MESH CONTRACTION:** On applying boneferroni test contraction of mesh is significant among 3 groups.

**Return to Work:** Patients returned to work on an average of 22 days in polypropylene small pore group, 13.5 days in knitted composite group and 18 days in polypropylene large pore group. Statistically difference is significant among 3 groups. Patients in both groups took an average of 2 weeks to return to their normal activities, return to work required an additional week in study done by by Patrick J. O'Dwyer, MD, FRCS, \* Michael G. Serpell.<sup>6</sup>

In our study no patient developed anaphylaxis. A study done by Davis L et al in 2003, showed the anaphylaxis rate of about 1% to local anaesthesia.<sup>11</sup> Pain is the main factor in post-operative morbidity. In this study 3 patients complained of pain, 1 in each group.

Another advantage of avoiding general anesthesia is having conscious patient during the operation. Patient can cough to increase intra-abdominal pressure during exploration for checking the efficacy of repair. Local anesthesia is also considered as an assurance for more delicate surgical manipulation. Surgeon will have to dissect the tissues gently and the assistant will have to retract the wound edges with caution.<sup>12</sup> Several randomised data from the Swedish hernia register have shown local anaesthesia is being used increasingly for repair of inguinal hernia.<sup>13-16</sup>

**In Our Study we fixed the Mesh with Absorbable Suture:** In a single-blind randomized clinical trial done by Jeroukhimov et al it was concluded that there was reduced postoperative chronic pain after tension-free inguinal hernia repair using absorbable sutures.

**Economy:** Inguinal hernia results in a barrier to work for a significant and productive percentage of the population, jeopardizing the patients and their dependents, burdening the State and causing chaos in clinics.

In our study, there was no need of iv drip, there was no need of many drugs, preparation, anesthetist during whole procedure like spinal anesthesia or GA. Monitoring of pulse B.P, ECG was not needed except in cases with co-morbidity and sedation. Most inguinal hernias are still repaired without any observation unless the general condition of the patient is very poor.<sup>17</sup> This will reduce total hospital cost of hernia repair, and also better in countries where bed patient ratio is below optimum.

In study done by Dr. Ashok patel it was found that cost of anaesthesia, drugs and management of complications is <400 Rs. In local anaesthesia group and 1000 Rs. In spinal anaesthesia group.<sup>17</sup> GA hernia repair cost 4% more than the same operation under LA (Study done by Patrick J. O'Dwyer, MD, FRCS, \* Michael G. Serpell).<sup>6</sup>

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**Quality of Life:** In our study difference in quality of life is significant b/w polypropylene small and polypropylene large pore mesh, b/w polypropylene small pore and knitted composite mesh group (Bonferroni test) & pp large pore when compared with knitted composite mesh group (Bonferroni test). This is supported by study of S. Bringman, S. Wollert, they concluded that Use of light weight mesh (which is comparable to large pore mesh in our study) did not affect recurrence rates, but improved some aspects of pain and discomfort 3 years after surgery.

**CONCLUSION:** The conclusion of our study are:

1. Most of the inguinal hernia surgery can be carried out smoothly in local anesthesia, as day care surgery.
2. Patients with comorbidity were operated under LA without subjecting them to adverse effect of spinal or general anesthesia. There was faster recovery and no increased risk by surgical /anesthetic procedure. It makes LA choice of procedure also in patients with comorbidity.
3. All patients returned to normal activity within 1 day and to work also earlier,
4. There is no increased recurrence after using absorbable suture to fix the mesh.
5. Overall cost of surgery decreased when done under LA.
6. Contraction of knitted composite mesh is least, than polypropylene large pore mesh & that of polypropylene small pore mesh is maximum.
7. Quality of life is better with knitted composite group, than polypropylene large pore, and poor with polypropylene small pore mesh.
8. Large pore mesh is superior than small pore mesh, & large pore knitted composite mesh is superior than large pore polypropylene mesh.

Inguinal hernia	Pp small pore	Knitted composite	Pp large pore
Right Direct	10(43.47)	6(26.08)	5(21.73)
Left Direct	7(30.43)	4(17.39)	5(21.73)
Right Indirect	5(21.73)	11(47.82)	10(43.47)
Left Indirect	1(4.34)	2(8.69)	3
<b>Total</b>	<b>23</b>	<b>23</b>	<b>23</b>

**Table 1: DIAGNOSIS-TYPE OF INGUINAL HERNIA**

Group	Min (%)	Max (%)	Average (%)
Polypropylene Small Pore	16.8	29.49	24
Knitted Composite	7.5	24.1	15
Polypropylene Large Pore	11.86	28.53	18

**Table 2: CONTRACTION OF MESH AT 1 MONTH IN%**

Group	Min (%)	Max (%)	Average (%)
Polypropylene Small Pore	22.44	29.7	28.76
Knitted Composite	15.49	24.09	17.21
Polypropylene Large Pore	15.39	29.49	23.09

**Table 3: CONTRACTION OF MESH AT 3 MONTH IN%**

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Group	Min	Max	Mean
Polypropylene Small Pore	0	69	43.82
Knitted Composite	0	40	12.95
Polypropylene Large Pore	0	55	26.26

**Table 4: POST OPERATIVE COMFORT SCALE QUESTIONNAIRE SCORE AT 1 MONTH**

	Min	Max	Mean
Polypropylene Small Pore	0	63	37.17
Knitted Composite	0	33	7.69
Polypropylene Large Pore	0	49	21.30

**Table 5: POST OPERATIVE COMFORT SCALE QUESTIONNAIRE SCORE AT 3 MONTH**

		Intraoperative pain at 10 min		Total
		Yes	No	
Group	Polypropylene Small Pore	2	21	23
	Knitted Composite	2	21	23
	Polypropylene Large Pore	2	21	23
<b>Total</b>		<b>6</b>	<b>63</b>	<b>69</b>

**Table 6: INTRAOPERATIVE PAIN AT 10 MIN**

		Comorbidity		Total
		YES	NO	
Group	Polypropylene Small Pore	3	20	23
	Knitted Composite	4	19	23
	Polypropylene Large Pore	2	21	23
<b>Total</b>		<b>9</b>	<b>60</b>	<b>69</b>

**Table 7: COMORBIDITY**

		Recurrence		Total
		YES	NO	
Group	Polypropylene Small Pore	1	22	23
	Knitted Composite	0	23	23
	Polypropylene Large Pore	0	23	23
<b>Total</b>		<b>1</b>	<b>68</b>	<b>69</b>

**Table 8: RECURRENCE IN POST OPERATIVE PERIOD**



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17. Dr. Ashok Kumar<sup>1\*</sup>, Dr. Sitaram Gothwal<sup>2</sup>, Dr. Sanjay Sharma<sup>3</sup>, Dr. Sunil Dhaka Scholars Academic and Scientific Publisher<sup>934</sup> Research Article A Prospective comparative study of Lichtenstein tension free hernioplasty under local Anesthesia versus spinal Anesthesia.

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