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Research Article

Postoperative Pain Following High Sac Ligation During Lichtenstein's Inguinal Hernia Repair – A Comparative Study

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ABSTRACT

Introduction: Lichtenstein's repair for inguinal hernia is considered to be one of the tension free and painless operations. However, pain is common even in the mesh repair era post operatively, and is mostly due to ilioinguinal nerve entrapment or periostitis due to mesh fixation to the pubic tubercle. Apart from these, during indirect inguinal hernia repair, sac ligation may also cause pain post operatively.
Aim: The aim of this study is to compare post-operative pain among patients undergoing high sac ligation versus sac reduction alone in elective Lichtenstein inguinal hernia repair.
Methods: Patients were randomly divided into two equal groups. In Group A, hernia sac ligation is performed using an absorbable suture (2'0 vicryl) and the excessive sac excised. In group B, hernia sac along with the prolapsing viscera was reduced to the peritoneal cavity along with the sac, without ligation. Followed by which Lytle's repair and Lichtenstein tension-free mesh repair was performed in all cases.The main measure of outcome was Mean postoperative pain score using VISUAL ANALOG SCALE on the 1st, 7th and 10th post operative days.
Results & Conclusion: There was significant decrease in the Postoperative pain in patients who did not undergo Sac ligation & there were no recurrences recorded among the two Groups in the follow up period of 3 years. Thereby High Sac ligation in Indirect Inguinal Hernia Lichtenstein's Repair can be deemed not only unnecessary but also causing increased postoperative pain which can be prevented by not doing a Sac ligation.

INTRODUCTION

Inguinal hernias are the most common - comprising approximately 75%of all anterior abdominal wall hernias[2]. Many exist in the community unreported, undiagnosed, and undetected, thereby causing a major economic problem. Despite the frequency of surgical repair, precise outcomes have still been eluding surgeons[3]. Surgical treatment of the inguinal hernias has seen tremendous trans-formation in the past few decades, including Laparoscopic repair[4]. The Lichtenstein tension-free hernioplasty began in 1984 and evolved over a period to a procedure which is now considered to be gold standard for hernia repair[5]. In this technique the fascia transversalis is reinforced by using a prosthetic mesh. This technique, that has a short learning curve, offers surgeons and patients a shorter operation time done on an outpatient basis, with minimal complications, and virtually low recurrence rate[6].Pain after inguinal hernia surgery is quite common a complaint in surgical wards. There are many reasons for post operative pain. This study is aimed at comparing post-operative pain among patients undergoing high sac ligation versus sac non ligation in elective Lichtenstein inguinal hernia repair.

Aims & Objectives

This study is aimed at comparing the post-operative pain among patients who undergo high sac ligation versus sac reduction in elective Lichtenstein hernia repair.

MATERIALS AND METHODS

Place of Study: Department Of General Surgery, Stanley Medical College Hospital, Tamilnadu.

Duration: March 2015 To February2018

Study Design: Double Blinded Randomized Controlled Study

Ethical Clearance: Clearance obtained Ethical Committee.

Inclusion Criteria

Clinically diagnosed patients of Indirect Inguinal Hernia of the Age group 20-60yrs.

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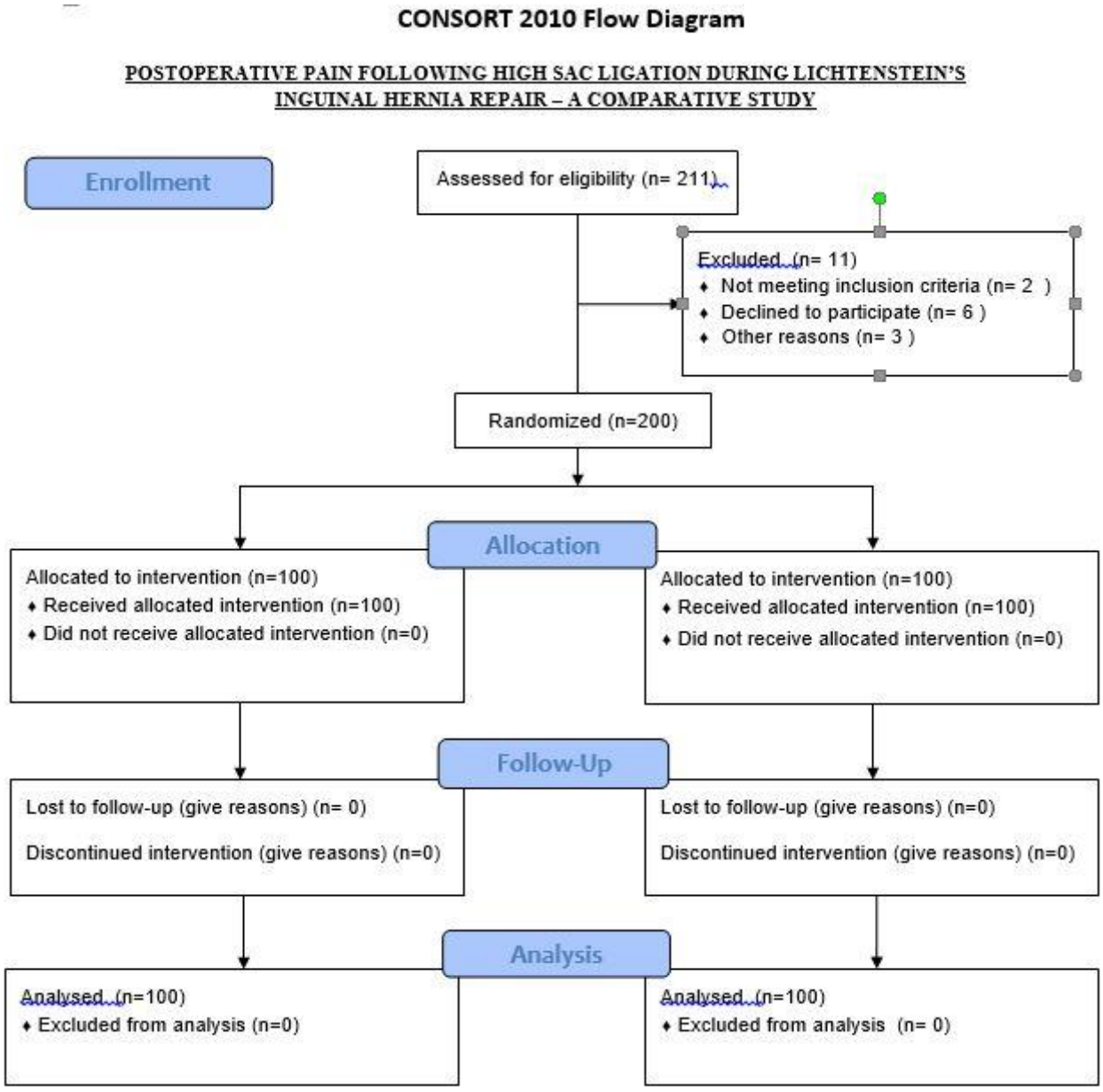
Exclusion Criteria

1. Patients with direct & indirect hernia in the same groin,
2. Bilateral inguinal hernia,
3. Recurrent hernia, clinically irreducible hernia, sliding hernia.
4. Clinically strangulated hernia, congenital hernia and Diabetic patients.

METHOD OF STUDY

- Sample size of 200 cases (100 in each group) is taken. An informed consent was obtained from them after discussion of risk versus benefit ratio. The study is Double blind.
- Patients were divided randomly in two equal groups. Group A included patients undergoing high sac ligation while Group B included sac reduction patients.
- All patients were operated under regional anesthesia.
- In Group A, after confirming intra operative diagnosis of indirect inguinal hernia, hernial sac is opened, its contents returned to the peritoneal cavity, the excessive sac excised and ligation of sac performed using an absorbable suture (2'0vicryl).



- In Group B, after confirming intra operative diagnosis of indirect inguinal hernia, hernial sac along with its contents were reduced and returned to peritoneal cavity without ligation of the sac.
  a. Lytle's repair (with 2'0 prolene) is done for all patients.
  b. Later on, in both groups, Lichtenstein tension-free mesh repair was performed. Care is taken to avoid ilio-inguinal nerve entrapment. The average operative time is 60 mins (ranging 20 – 80mins)
- In cases of uneventful recovery all patients were discharged after 24 hrs.
- The main outcome measure is mean postoperative pain score measuring using VISUAL ANALOG SCALE on 1st, 7th and 10th post operative days.

0-1 : No/negligible pain
2-4 : Mild pain
5-7 : Moderate pain
8-10 : Severe pain

All patients were given standard dose 50mg i.m of Diclofenac sodium postoperative analgesia in bolus form 8 hourly. All Patients were followed up at the day of discharge (24 hrs after operation) and as an outpatient at 1st week(7th day) and 10th day after the operation. Information collected from the proforma was entered into SPSS version23.0 for analysis. Quantitative variables like age and pain was presented in the form of mean + S.D. T-test was used to compare the mean pain score in both groups. P value< 0.05 was considered as significant.

RESULTS & ANALYSIS

- 106 patients (53%) had Left sided Inguinal Hernia, 94 patients (47%) had Right sided Inguinal Hernia [Table 1].
- Mean Age Group of patients in Group A was 46yrs, in Group B was ~45 yrs [Table 2].

Table 1

Side of Hernia			Groups		Total
			Group A	Group B	
Side	L	Count	53	53	106
		%	53.0%	53.0%	53.0%
	R	Count	47	47	94
		%	47.0%	47.0%	47.0%
Total		Count	100	100	200
		%	100.0%	100.0%	100.0%

Table 2

Groups		N	Mean	SD
Age	Group A	100	46.0	8.8
	Group B	100	44.8	8.9

Postoperative PAIN

POD-1

- 42 Patients (42%) experienced mild pain, and 58 Patients (58%) experienced moderate pain in Group A (Sac ligation).
- 99 (99%) Patients experienced mild pain, and 1 patient (1%) experienced moderate pain in Group B (Sac non-ligation).

POD-7

All 100 patients (100%) experienced mild pain in Group A (sac ligation), whereas 15 patients (15%) experienced no/negligible pain in Group B (non-ligation).

POD-10

- 93 (93%) Patients in Group A (sac ligation) experienced mild pain while 7 of them (7%) had no or negligible pain.
- Only 1 patient (1%) in Group B (non ligation) experienced mild pain while 99 of them (99%) had no or negligible pain.

Both the groups had a similar complication (seroma) rate, Group A with 8%(8 patients) & Group B with 7%(7 patients). Based on the VAS score the postoperative pain between Group A and B were compared on POD-1, 7 & 10 [Fig.1]. The mean postoperative pain on POD-1 in Group A was 4.55 ± 0.5, Group B – 3.37 ± 0.53. On POD-7 the mean VAS score in Group A was 3.37 ± 0.60, in Group B–2.09 ± 0.62. On POD-10 the mean VAS score was, Group A– 2.21 ± 0.56, Group B– 0.70 ± 0.482 [Table 3]. The p value between the two Groups was <0.005 which makes the result significant [Table 4]. There were no recurrences recorded among the two Groups in the follow up period of 3 years.

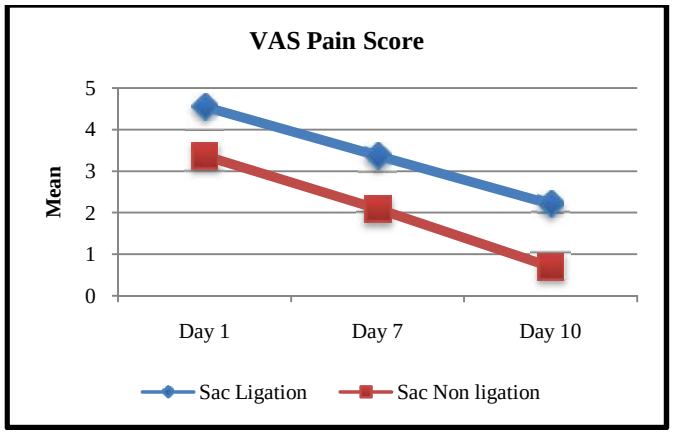


Fig 1

Table 3

VAS SCORE		Group A	Group B
VAS D1	Mean	4.55	3.37
	Median	5.00	3.00
	Std. Deviation	.500	.525
	Minimum	4	2
	Maximum	5	5
	Range	1	3
	IQR	1	1
VAS D7	Mean	3.37	2.09
	Median	3.00	2.00
	Std. Deviation	.597	.621
	Minimum	2	1
	Maximum	4	3
	Range	2	2
	IQR	1	0
VAS D10	Mean	2.21	.70
	Median	2.00	1.00
	Std. Deviation	.556	.482
	Minimum	1	0
	Maximum	3	2
	Range	2	2
	IQR	1	1

Table 4

	Mann-Whitney U	Z	p-value
VAS D1	882.500	-10.713	.0005
VAS D7	939.000	-10.463	.0005
VAS D10	277.500	-12.130	.0005

DISCUSSION

Although the traditional teaching in Lichtenstein's open hernioplasty emphasizes on ligation of the peritoneal end of sac after its transection at the level of deep ring, recent reports have stated that, leaving the sac unligated does not alter the outcome. Sac non ligation does not appear to have any early or late effects on repair integrity. "To ligate or not to ligate" is important as, non-ligation limits the dissection, reduces the risk of injury to the spermatic cord and prevents further morbidity and thereby makes the repair more complete and rapid. Ligation, on the other hand, needs more dissection and causes greater post-operative discomfort. It has also no added advantage in improving wound failure rate.

Regardless of the tension-free technique though it appears to be painless, mild or moderate pain still exists and mesh alone cannot be attributable as the only cause[1]. Mechanical pressure and ischemia resulting from ligation of the highly innervated peritoneal sac, causes increased post-operative pain. It is stated in literature that non ligation causes less postoperative pain and at the same time, does not increase the risk of recurrence[7]. Conventionally, Surgeons have long laboured under the burden of the 'hernia sac' in inguinal hernia. Thereby the 'sac' got an unique place in hernia surgery at the expense of the 'defect'. It is a long standing belief that high ligation of the hernia sac is an important adjunct to inguinal hernia operations[8].

Rutkow *et al* exclaims that hernial sac ligation produces a miniature 'peritonitis'. This iatrogenic peritonitis could be an aetiology towards postoperative discomfort and pain that accompanies hernia repair[9].

High dissection is the critical factor and not high ligation. High ligation does not seem to influence the recurrence rate of hernia repair but may be a cause of increased post-operative pain[10].The benefits of non-ligation of the sac has been investigated by Vincet *et al*, which demonstrated that non ligation does not increase the risk of recurrence whereas causes less post-operative pain. However, high dissection of the sac well upto the retroperitoneum and freeing the sac from the edges of the internal ring are important measures for prevention of recurrence[11].

Deliloukos *et al* in a study, demonstrated that postoperative pain was associated with significantly more episodes in people who underwent sac ligation, 27% more than who did not undergo sac ligation, 9% of which were statistically significant ($P \leq 0.05$). Thereby showing a significant benefit from the exclusion of High hernia sac ligation on postoperative pain in patients undergoing indirect inguinal hernia mesh repair[1].

According to Balakh Sher Zaman *et al*, ligation of the hernia sac in inguinal hernia surgery is not only unnecessary and time consuming but also leads to increased post operative pain[12]. Encouraged by the studies of Abrahamson J[10] and Vincet *et al*[8] the present study is designed to see the effects of sac reduction without ligation in indirect inguinal hernia repairs. The focus is on post-operative pain. The results of the present study has demonstrated that in patients undergoing sac reduction without ligation develop less postoperative pain and thereby decreased morbidities.

Limitations of the Study

The study is done only for irreduceable, non sliding hernia and hence could not be generalized for all Inguinal hernia cases.

CONCLUSION

Sac excision or Invagination without ligation does not have any adverse effect on repair integrity. They limit the dissection and reduce the risk of injury to the spermatic cord and surrounding structures, thereby preventing further morbidity. Recurrence rates are similar in people who undergo Sac ligation and Sac non ligation. Therefore High Ligation of the hernia sac in Lichtenstein's inguinal hernia surgery can be formulated as not only being unnecessary but also causing increased postoperative pain, making Lichtenstein's Hernia Repair with Non Sac Ligation as a viable alternative.

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Conflict of Interest

I (we) certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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