

Modified Lichtenstein Hernia Repair with Invagination of Inguinal Hernial Sac in Comparison with Ligation and Excision in Indirect Inguinal Hernia

S N Shirbur¹, Guruprasad N²

Author's Affiliation: ¹Professor, ²Assistant Professor, Department of General Surgery, M V J Medical College and Research Hospital, Bangalore 562114, India.

How to cite this article:

S N Shirbur, Guruprasad N, Modified Lichtenstein Hernia Repair with Invagination of Inguinal Hernial Sac in comparison with Ligation and Excision in Indirect Inguinal Hernia. *New Indian J Surg.* 2020;11(3):363–367.

Abstract

Background: To evaluate the incidence of early recurrence and chronic groin pain in the two groups of patients (group A=Ligation and excision, group B=Invagination) with indirect inguinal hernia and to observe different intraoperative and post-operative parameters in both groups.

Methods: This prospective randomized study was done in MVJMC and RH, from 1st December 2016 to 30th November 2017. All the cases of indirect inguinal hernia attending the surgical OPDMVJMC & RH hospital were enrolled in this study. All the patients underwent Lichtenstein tension free repair. A total of 50 patients were enrolled in this study. MedCalc Software Version 12.5.0 was used for the analysis of the data and Microsoft word and Excel was used to generate graphs and tables.

Results: 50 patients of indirect inguinal hernia with more than 18 years of age were enrolled and divided into two groups. Intra operative complications, post-operative pain by VAS and post-operative complications observed, which was found insignificant. There was no seroma and induration on both the study group at 3 months and 6 months interval. No local swelling (recurrence) in inguinal region was

seen in patients (both group A and group B) during the 6 months follow up period.

Conclusions: This study shows no difference in outcome of results in Lichtenstein tension free hernia repair for indirect inguinal hernia with two different techniques in dealing with sac except less postoperative pain in invagination of sac as compared to ligation and excision.

Keywords: Excision of sac; Hernial sac; Invagination of sac; Indirect inguinal hernia; Postoperative pain.

Introduction

Every surgical technique needs to be studied, its merits and demerits to be assessed, so that the patients in future may undergo only the best of the procedures. Thus, research into newer techniques helps in improving the morbidity and mortality associated with the older standardized technique. As surgeons, authors need to reinvent themselves everyday so that the patient will gain maximum benefit from their efforts.¹ The surgical treatment of inguinal hernias has evolved through several stages to reach a modern and successful era. Hernia repair is one of the most commonly performed general surgical procedures worldwide.^{2,3} Since the time, Bassini described his technique the search for an ideal inguinal hernia repair is still on.^{4,5} An ideal hernia repair should be tension free, tissue based with no potential damage to vital structures, no long-term pain or complications and no recurrence.⁶ Recurrences have frustrated surgeons of all ages,

Corresponding Author: S N Shirbur, ¹Professor, Department of General Surgery, M V J Medical College and Research Hospital, Bangalore 562114, India.

E-mail: dr.shirbur.s@gmail.com

experience, skill and nationality. One of the cardinal causes for recurrence was thought to be failure to do high ligation of sac because of the emphasis on the sac, its ligation is done as a sacred ritual. The emphasis has now shifted from the sac to the defect and hence the necessity to ligate the sac has been questioned.¹ Sac invagination will be associated with a decreased incidence of future adhesive complications and less pain because the richly innervated peritoneum is not incised.^{5,6}

Edoardobassini recommended excision and high ligation of the indirect hernia sac in 1876. Even in the laparoscopic era, due to long and complex learning curve of laparoscopic hernia repair, open Lichtenstein tension free meshplasty is accepted as gold standard in inguinal hernia repair in modern era.^{7,8} Need to ligate the sac has been questioned by a group of surgeons as this group trusts that suturing of peritoneum causes ischemia which leads to impaired healing, increasing postoperative pain and also increased chances of haematoma formation postoperatively.

The purpose of this study to find out the effect of invagination of the hernia sac on post-operative pain and recurrence rates. Early recurrences are mostly due to surgical technique failure, lack of surgeon's experience, suture material, dealing with the hernial sac, suture technique (tension suture), mesh technique, postoperative infection and patient's nourishment.⁹

Post-operative pain may be either acute or chronic. Chronic groin pain is defined as the pain lasting more than 3 months duration at groin region after inguinal hernia repair.¹⁰⁻¹²

Methods

The Primary aim of present study was to evaluate the incidence of early recurrence and chronic groin pain in the two groups of patients and the secondary aims was to observe following parameter in both study group, intraoperative complications like rupture of sac, bleeding, damage to cord structure, postoperative complications like seroma, scrotal edema, wound infection, hematoma, urinary retention.

Prospective study randomized time bound study, 50 patients were studied randomization was done by envelope method-Group A (Invagination) and Group B (Ligation and excision).

This prospective randomized study was done in MVJMC & RH, from 1st December 2016 to 30th November 2017. All the cases of inguinal hernia attending the surgical OPD in MVJMC & RH are enrolled in this study. The diagnosis of primary

inguinal hernia was made on the basis of history of reducible groin swelling and essentially on clinical examination. All the patients underwent Lichtenstein tension free repair. All the patients of uncomplicated unilateral//bilateral indirect inguinal hernia of age >18 years were included in this study. Patients of age <18 years, complicated inguinal hernia, obstructed or strangulated inguinal hernia, irreducible inguinal hernia, local skin infection, complete indirect inguinal hernia and patient with chronic cough were excluded.

Operation was performed by Lichtenstein tension free repair after preoperative preparation, oblique inguinal incision was kept. The Inguinal canal was opened in the usual manner. The indirect hernial sac dissected up to the neck at the level of deep inguinal ring.

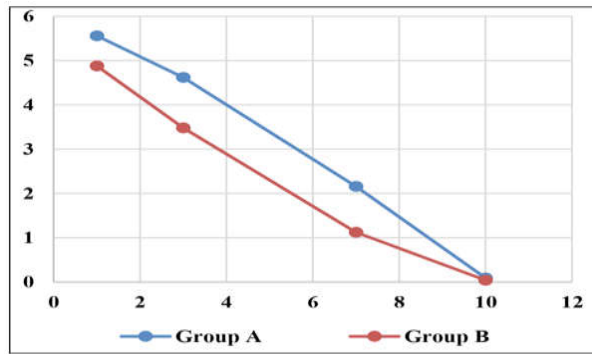
The sac was ligated at the deep ring and distal part excised in the traditional manner (group A). In group B, the indirect sac was invaginated into the peritoneal cavity. The repair of the deep ring was done and prolene mesh applied in all the patients in the usual way. Antibiotic prophylaxis using IV Amoxicillin plus clavulanic acid was provided to all patients.

Post-operative observation recorded were postoperative pain (Visual Analogue Scale) (13) on daily bases for 10 days, postoperative complications like wound hematoma, wound seroma, wound infection, urinary retention, scrotal swelling and recurrence observed. dressing was done on 2nd, 5th and 10th postoperative days. Follow up was done on at 1st, 3rd and 6th month postoperatively for chronic groin pain and recurrence.

The analysis of data was done by using MedCalc Software Version 12.5.0 and Microsoft word and Excel to generate graphs and tables. Student t-test (two tailed, independent) used to find the significance of study parameters on continuous scale between two groups and chi-square test was used for calculation of p value, p value of <0.05 was considered significant.

Results

The mean age of presentation in group A was 44.97±14.34 years and in group B was 46.76±16.13 years. There was no significant difference in the age in both the groups (p=0.67).



Vas score in both the groups.

Post-operative pain scoring shows no significant difference in VAS score of both the study groups till 7th pod. On the 8th POD (as shown in the Figure 1) the VAS (visual analogue score) in group B was significant, (p value <0.014). Overall, group B experienced less pain compared to group A.

Intra operative complications like rupture of sac, bleeding due to pampiniform plexus and damage to cord structure were at the time of skeletonization of cord shown in the Table 1. There was no difference in the same in both study groups (statistically not significant).

Complications	Group A (n=25)		Group B (n=25)		Total (n=50)		P value
	N	%	N	%	N	%	
Seroma	2	8	3	12	5	10	0.69
Scrotal edema	4	16	3	12	7	14	0.59
Wound infection	1	4	2	8	3	12	0.67
Urinary retention	5	20	5	20	10	20	0.68
Haematoma	2	8	1	4	3	12	0.89
Local swelling	0	0	0	0	0	0	-

Above Table 2 shows the post-operative complications observed in both study groups. The most common post-operative complications were seroma, scrotal edema, wound infection, urinary retention, haematoma and local swelling. There was no statistical difference among both study groups. There was no recurrence in both the groups during this study period. However, long term follows up was required to judge the recurrence rate.

Early recurrence was usually due to operation related factors like, tissue tension while suturing, suture material used, way of dealing with the sac (either invagination or ligation and excision), type of hernia repair, post-operative infection and other post-operative complications (haematoma, seroma) and at the last experience of the surgeon.¹³ Late recurrences are mostly due to patients factors like collagen defects that leads to thinning of scar tissue

and continued weakness to inguinal floor, age and medical co-morbidities.¹⁴

Discussion

Inguinal hernia is the most common surgical abdominal condition in adults. the sac got an important place in hernia surgery at the expense of the 'defect'. It is long held belief that ligating the sac is an important adjunct to groin hernia operations.¹

Various reports discussing recurrence considered excision and high ligation of the indirect inguinal hernia sac an essential part of the repair and if not performed properly, recurrence is more common. Studies reporting of open hernia technique still describe ligating the sac, the sac ligation was either quoted in or over emphasized as an essential part of the repair.² There was however very little support for this step and no further clinical or experimental analysis provided.³⁻⁵

In the original description of the Lichtenstein technique, the indirect hernia sac is dissected from the cord to a point beyond the neck of the sac, opened and then returned into the preperitoneal space without excision. The sheet of mesh should protect against and hold back any indirect hernia bulge.^{11,12} The reported recurrence rate was very low in mesh repair.



Non ligation & excision of the sac

In Rutkow's mesh plug repair, it was 0.2 to 0.4% for lichtenstien repair.^{15,16} The present study of 50 cases was carried out in the Department of Surgery at MVJMC & RH, Between December 2016 to November 2017.

Table 3: Post-operative pain (VAS Scores).

Studies	Group A (ligation and excision)	Group B (invagination)	P value
Othman I et. al. ¹	4.06±2.43	3.04±2.11	0.049
Col PV et. al. ²	3.5±0.97	2.86±0.70	0.001
Ranga HR et. al. ⁶	2.8±0.764	2.68±0.69	0.568
Delikoukos S ⁵ et. al.	2.8±1.4	2.3±1.2	<0.05
Present study	5.93±1.12	4.39±1.03	0.012

Othman I et. al., found that the mean post-operative pain score in group A was 4.06±2.43 and in group B it was 3.04±2.11 with P value was 0.049, which was statistically significant.¹ In Col PV et. al., study mean post-operative pain score in group A was 3.5±0.97 and in group B it was 2.86±0.70 with P=0.001, which was statistically significant with less pain in group B.² Ranga HR et. al., study mean post-operative pain score in group A was 2.8±0.764 while in group B was 2.68±0.69 with p value=0.568, which was not statistically significant.⁶ Delikoukos S et. al., study mean post-operative pain score in group A was 2.8±1.4 and 2.3±1.2 in group B with p value <0.05.⁵ In this study, mean post-operative pain score was 5.93±1.12 in group A and 4.39±1.03 in group B with P value 0.012, author observed that, lower pain score was reported among patients in group B (invaginating group) in comparison to group A (ligation and excision) may be invagination of sac require less dissection as compared to ligation and excision in which sac was ligated deep to internal ring and then excised. This may contribute to significantly less post-operative pain in the invagination of sac (group B), compared to ligation and excision of sac (group A).

In this study, early complications like seroma, scrotal oedema, wound infection and urinary retention are the same in both the study group hence, not statistically significant.

Table 4: Early complications.

Studies	Early complications									
	Seroma		Scrotal edema		Wound infection		Urinary retention		Local swelling	
	A	B	A	B	A	B	A	B	A	B
Othman I et. al. ¹	0.60%	0%	—	—	1.20%	0.60%	—	—	0%	0%
Ranga HR et. al. ⁶	8%	4%	4%	8%	0%	0%	16%	8%	0%	0%
Present study	8%	12%	16%	12%	4%	8%	20%	20%	0%	0%

Table 5: Chronic pain.

Studies	Chronic pain		Local swelling (recurrence)			
	Group A	Group B	P Value	Group A	Group B	P value
Othman I et. al. ¹	1.8%	1.8%	—	0.60%	1.8%	0.429
Present study	10%	2%	0.35	0%	0%	

According to the study, done by Othman I et. al., the incidence of chronic pain was the same in both the groups (n=57, incidence 1.8). In the present study, incidence of chronic pain in group A was 10% and 2% in group B with P value 0.35.¹ It was found to be of no statistical significance (n=25).

There was no exact cause for post-hernioplasty pain but there was a strong foreign body fibrous reaction at the site of mesh placement causing spermatic cord and nerve entrapment leading to chronic pain. Implying that the reason of chronic pain was the same in both the groups.

Recurrence in a study by Othman I et. al., in group A (n=57) was 0.60% and in group B (n=54) was 1.80% with p value of 0.429. In present study, no patient in either group had recurrence (6 months follow up).

Different surgical teams, less number of cases (25 cases in each group) and short follow up period are the limitations of this study hence, multicentric large randomized control studies for proper assessment was required.

Conclusion

In present study, comparison between invagination of inguinal hernia sac with ligation and excision of sac by Lichtenstein's tension free repair in indirect inguinal hernia was done, author found that there was a difference in incidence of chronic pain in group B (n=25) as compared to group A (n=25). Complications like seroma, scrotal swelling, hematoma, wound infection and urinary retention, comparable in both the groups. After 6 months, there was no recurrence in group A or group B. However, longer follow up was required to judge the long-term recurrence. At the end, author observed that there was minimal difference in outcome of results

in Lichtenstein tension free hernia repair for indirect inguinal hernia with two different techniques in dealing with sac, while invagination of hernial sac technique has advantage of less postoperative pain as compared to ligation and excision.

Funding: No funding sources *Conflict of interest:* None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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