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Original Research Article

Randomized Trial to Compare Indirect Hernia Sac Excision with Sac Invagination in Lichtenstein Mesh Hernioplasty: A Study of 60 Patients

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Abstract:

Background: Lichtenstein tension free mesh hernioplasty is the preferred method of hernia repair by majority of surgeons. Recently it is believed that ligature and excision of richly innervated and vascularized peritoneal sac in indirect inguinal hernia leads to postoperative pain and discomfort due to miniature peritonitis. Many studies conclude that invagination of sac is better. So the aim of the study was to compare the two techniques with regard to postoperative pain, complications and recurrence in indirect inguinal hernia patients.

Methods: This study is single centered, prospective, randomized study, carried out in Govt. RDBP Jaipuria Hospital between January, 2022 to June, 2022. A total 60 patients were enrolled which were randomized in two groups, A- ligation and excision of sac, B- invagination of sac. All patients with indirect inguinal hernia were included and congenital hernia, complicated hernia, complete indirect hernia excluded. All the cases were followed up for 3 months. Visual Analogue Scale (VAS) used to assess postoperative pain.

Results: Most common age group was between 21-30 yrs. Significantly lower postoperative pain was found at 6, 12 and 24 hours but on postoperative day 7 and 15 was less in ligation and excision group but difference was not significant. Post-operative complications like Seroma, Scrotal edema, Urinary retention, Hematoma were comparable though the difference was not statistically significant. Chronic groin pain was found in 1 patient in each group. No short recurrence at 3 months was noticed in any patient.

Conclusion: Invagination of sac results in less postoperative pain compared with ligation and excision of sac with no significant difference in postoperative complications and recurrence with any surgical techniques.

Introduction

Inguinal hernia is very commonly encountered in surgical practice. It is the most common variety of hernia in both males and females. Hernia repair is one of the most commonly performed general surgery procedure worldwide [1]. The research for the most ideal technique for hernia repair is still continuing. The techniques have evolved from earlier tissue repair surgeries to tension free mesh repair, from open procedure to laparoscopic procedure but still open tension free Lichtenstein mesh repair continues to be widely performed. Bassini recommended high ligation and excision of indirect hernial sac [2]. In Lichtenstein repair, the sac is either inverted or excised [3].

Ideally inguinal hernia repair should be tension free, with no damage to vital structures, without post-operative complication, with least evidence of post-operative chronic groin pain and recurrence rate [4]. Recently it is believed that ligation of peritoneal sac which is richly innervated is responsible for increased post-operative pain and also the vascularized peritoneum produces a miniature peritonitis which leads to post-operative discomfort and other complications [5]. Whatever be the technique of hernia repair, persistent postoperative pain and recurrence are two major problems encountered and one of the cardinal causes of recurrence is the failure to perform a high ligation of the sac [6]. In modern operations for inguinal hernia, including laparoscopic repairs, the sac is not ligated but is simply inverted or excised without ligation. Several studies have examined the best way to manage the hernial sac but no consensus has been reached [3,7]. But result from these studies show that management of the indirect hernial sac may influence the rate of recurrence and the development of postoperative pain [6].

The purpose of the study was to compare the effects of invagination of hernia sac with ligation and excision of hernia sac in patients with indirect inguinal hernia undergoing tension free Lichtenstein inguinal mesh hernioplasty with emphasis on postoperative pain, complications and early recurrence rate.

Methods

The present study was a prospective randomized study conducted at Govt. RDBP Jaipuria Hospital between January, 2022 to June, 2022 with the permission of Research Review Board of the Hospital. A total of 60 patients were enrolled in this study on the basis of the inclusion and exclusion criteria. They were randomized into two groups –

Group A: 30 patients in whom ligation and excision of inguinal hernial sac done.

Group B: 30 patients in whom invagination of hernial sac done.

Patients included in the study were all patients with indirect inguinal hernia undergoing open Lichtenstein tension free inguinal mesh hernioplasty who were willing to be part of the study. Those with congenital inguinal hernia, complicated inguinal hernia like irreducible, obstructed or strangulated hernias, complete indirect inguinal hernia or with local skin infection were excluded from the study. Only patients with unilateral hernias were included in the study.

All study participants underwent detailed medical history, clinical examination and abdominal ultrasound examination in addition to routine hematological and biochemical investigations for preparation for anesthesia.

Patients were hospitalized a day prior to day of surgery. All procedures were performed under spinal anaesthesia. All patients received a single intravenous dose of ceftriaxone 1gm, 30 minutes prior to surgery.

Operation was performed by Lichtenstein tension free meshplasty using prolene mesh. During surgery, the indirect sac was dissected up to the neck. In group A, after dissection the sac was transfixed at the neck and excised in the traditional manner. In

group B, after dissection the sac was not opened and was inverted with the finger into the peritoneal cavity. Following this, a prolene mesh of size 7.5X15 cm was placed in usual manner and fixed at multiple points. Postoperative pain was measured for two weeks after surgery using pain visual analog scale (VAS) at 6 hours, 12 hours, 24 hours and post-operative days 7 and 15. Patients were discharged from hospital in the first post-operative morning. Post-operative complications like seroma, scrotal edema, hematoma, wound infection, urinary retention, any other complication within first 24 hr. and then on post-operative day 7 and day 15.The patients were followed up at one month and three month on OPD basis to evaluate for any chronic groin pain or early recurrence.

Quantitative variables were expressed as mean ±SD. Qualitative variables were expressed as frequency and percent. Quantitative parametric variables were compared between the three groups using the ANOVA test, quantitative non-parametric variables were compared using Mann- Whitney test. Qualitative variables were compared using Chi-square test or Fisher exact test when the criteria for using Chi-square were not sufficient. For statistical significance was kept at $p<0.05$.

Results

A total of 60 patients were included in the study and were divided into two groups with 30 patients in each group. The demographic characteristics of the two groups is summarized in Table 1. Both groups were comparable to each other with in terms of age. In both the groups, maximum patients were in age group of 21-30 years. Only one female underwent surgery during the study period.

Early complications like seroma formation, scrotal edema, superficial wound infection, urinary retention and hematoma formation were evaluated in both groups [Table 2]. There was no significant difference in the two groups with regards to any postoperative complication. Seroma, scrotal edema and hematoma formation were managed conservatively. For superficial wound infection, antibiotics as per culture sensitivity report were given. Mesh removal or drainage was not required.

Postoperative pain was measured at 6, 12 and 24 hours, POD 7, POD 15 using VAS scale. The mean scores of the two groups are mentioned in Table 3. There was significantly lower pain score at 6, 12 and 24 hours postoperatively in the group undergoing invagination of indirect hernial sac [Group B]. At POD 7 and POD 15 also the mean pain score was lower in Group B but the difference was not statistically significant. At 1 month postoperatively, 5 patients in Group A and 4 in Group B had mild pain which was managed by NSAIDs and by 3 months postoperatively only 1 patient in each group had some amount of pain. Those having pain at 3 months were labelled as having chronic groin pain. The difference between the complications in the two groups was statistically insignificant.
No patient reported short term hernia recurrence at 3 months postoperatively in either group.

Table 1: Demographic Characteristics of Patients

Characteristics		Group A	Group B
Age (MEAN ± Sd)		48.4 ± 5.4	44.7 ± 3.8
Gender	Males	29	30
	Females	1	0
Age Group	21-30	12	10
	31-40	8	11
	41-50	5	3
	51-60	3	4

	> 60	2	2

Table 2: Early Complications in the two Groups of Patients

Complications	Group A	Group B	P Value
Seroma	3	2	> 0.05
Scrotal Edema	2	3	> 0.05
Wound Infection	2	1	> 0.05
Urinary Retention	1	0	> 0.05
Hematoma	1	1	> 0.05

Table 3: Comparison of the two Groups in Terms of Post-Operative Pain (Using VAS Scale)

	Group A	Group B	P-Value
6 Hours	7.16 ± 0.20	6.21 ± 0.68	<0.05
12 Hours	6.35 ± 0.24	5.80 ± 0.30	<0.05
24 Hours	5.06 ± 0.85	4.16 ± 0.44	<0.05
POD 7	2.17 ± 0.46	2.01 ± 0.58	> 0.05
POD 15	1.04 ± 0.45	0.94 ± 0.76	> 0.05

Discussion

High ligation followed by excision of the sac is considered as the method of choice for hernial sac management in indirect inguinal hernias. However, there are many studies that have shown that ligation and excision of the sac is a needless step and adds to postoperative pain by causing ischemic necrosis of peritoneum[6,8,9].

Also in modern laparoscopic hernia surgeries, including transabdominal preperitoneal (TAPP) repair and totally extraperitoneal (TEP) repair, the sac is simply invaginated and the recurrence rate in laparoscopic hernia repair has been comparable to the open repair. The present study was therefore carried out to compare sac ligation and excision with sac invagination in indirect inguinal hernia patients undergoing Lichtenstein mesh hernioplasty.

The two groups were comparable to each other in terms of mean age. Maximum number of patients were in age group of 21-30 years, similar to other studies [5].

Like other studies no significant difference was found with regard to postoperative complications between the two groups [4, 5, 9]. Some authors have found certain complications much more commonly in one group but the difference has not been reported to be statistically significant. Postoperative pain was measured at 6, 12 and 24 hours, POD 7, POD 15 using VAS scale and mean scores were calculated. While in the present study significant difference in pain scores was noticed at 6, 12 and 24 hours with scores being lower in sac invagination group. This is in contrast to study by Ranga *et al*[4] who did not find any significant difference in pain scores at 6, 12 and 24 hours but found significantly lower pain score on POD 21. Other studies have also reported similar results to Ranga *et al* which are different from the present study [10, 11].

The results of the present study show that the pain experienced by patients in the immediate postoperative period was significantly less in the group with invagination of sac compared with the group with excision of the sac. This was first shown in a controlled study by Smedberg *et al* [8] in 1984 and later proved in other studies by Delikoukos *et al* [12] and Sharma *et al* [6].

The cause of this higher pain score in ligation and excision group is considered to be due to suturing of peritoneum which causes ischemia leading to impaired healing, increasing postoperative pain and also increased chances of haematoma formation postoperatively [9].

In the present study, there was no short term recurrence in either group during the follow-up period of 3 months. It was earlier believed that failure to undertake high ligation of the sac might be the cause of recurrence of hernia. More recent studies done have shown that ligation of sac does not affect the recurrence rate [8,11]. Thus, invagination of sac is not considered to be associated with higher recurrence rates.

Although there was no reported recurrence found at the end of 3 month in any group, however the authors are of the opinion that longer follow up with a larger study population is required to evaluate for recurrence.

Conclusion

The post-operative pain was significantly less in case of invagination of indirect inguinal hernia sac as compared to excision and ligation of sac till postop day 15. Incidence of groin pain at 1 month was found to be less in sac invagination compared with sac excision though it was not statistically significant. Incidence of chronic groin pain at 3 months was similar in both groups. Difference between post-operative complications was comparable but not statistically significant with any surgical technique.

References

1. Col PV, VSM YS, Col CJ, *et al*. Recent trends in dealing with inguinal hernial sac. Med J Armed Forces India. 2003;59(2):108-10.
2. Bassini E. Ueber die Behandlung des Leistenbruches. Archiv fiirk linsche chirurgie 1890; 40: 429-76.
3. Lichenstein IL, Shulman AG, Amid PK, *et al*. The tension free hernioplasty. Am J Surg 1989;157(2):188-93.
4. Ranga HR, Kaushik K, Garg DK, Garg P. The difference in outcomes of excision versus invagination of hernial sac in management of indirect inguinal hernia. J Evol Med Dental Sci-JEMDS. 2016; 5(40): 2526-9.
5. Dave JP, Samdani SR, Bhatt JG, et al. A Prospective Comparative Study of Invagination of Indirect Inguinal Hernial Sac with Excision of Indirect Inguinal Hernial Sac. International journal of science and research IJSR 2021; 10(3): 472-75.
6. Sharma M, Pathania OP, Kapur A, *et al*. A randomised controlled trial of excision versus invagination in the management of indirect inguinal hernial sac. Ann R Coll Surg Engl. 2019; 101(2): 119-122.
7. Shafik A. Invagination of hernial sac stump: technique for repair of inguinal hernia. Am J Surg 1980; 140: 431–436.
8. Smedberg SG, Broome AE, Gullmo A. Ligation of the hernial sac? Surg Clin North Am 1984; 64: 299–306.
9. Gupta RA, Jain AP, Vasava M. Invagination of inguinal hernial sac in comparison with ligation and excision in indirect inguinal hernia. Int Surg J 2019; 6: 547-51.
10. Bansal AR, Garg P, Ghei M. Transfixation of neck of hernia sac – a needless step in adult? Indian J Gastroenterol 2003; 22(1): 33.
11. Vincent PJ, Singh Y, Pujahari AK, et al. Recent trends in dealing with hernia sac. Medical Journal Armed Forces India (MJAFI) 2003; 59: 108-110.
12. Delikoukos S, Lavant L, Hilas G, *et al*. The role of hernia sac ligation in post-operative pain in patients with elective tension-free indirect inguinal hernia repair: a prospective randomized study. Hernia 2007; 11:425–428.