



LIGATION OF THE INDIRECT INGUINAL HERNIA SAC: IS IT AXIOMATIC? A CONTINUED STUDY

General Surgery

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ABSTRACT

The hernial sac does not play a crucial role in the problem of hernia. Hence ligation of this sac should not be taken as an axiomatic step. We have operated on 30 patients (Continuous study) aged between 6 months to 60 years, where the hernial sac has not been ligated but has only been divided at the level of deep inguinal ring. The peritoneum was then allowed to fall back and a standard Bassini's repair using 2/0 Prolene was done in each case except in 5 children where no such repair was done. In this study, the severity of pain was divided into mild pain requiring no drug, moderate pain requiring only oral drugs and severe pain requiring injectable analgesics. On the first postoperative day 25 out of 35 patients had severe pain and they required injectable analgesics. There was dramatic change on the second day only 4 patients had severe pain. There was only one complication in the form of wound infection on third postoperative day but it cleared off by the 10th day and no complications were observed during follow up. 19 patients turned up in the follow up and no recurrence was noted in any of the patients.

KEYWORDS

Hernia, Bassini's repair, pain, Complication, analgesics

INTRODUCTION

Inguinal hernias are common and continue to be one of the main challenges which a surgeon face. Despite the advances in surgical technology and immunology in the last ten years, we are still faced as was Celsus, in the first century B.C., with patients complaining of Protrusion of the abdominal wall. From the patient's perspective, hernia is an uncomfortable and sometimes painful disability which may prevent him working. Fortunately, these are relatively simple and safe to repair. Throughout the history of modern surgery for groin hernia, several procedures have been presented with very good results, but the results have sometimes been difficult to reproduce. The relationship between the type of hernioplasty and recurrences have been a continuing matter of disagreement (Smedberg et. al. 1984). No one, however, questions the necessity for surgery where the excision of that part of the sac that traverses the abdominal wall, back to the level of the parietal peritoneum, is an essential part of any type of surgical repair (Ferguson, 1978). Additionally in order to prevent recurrences, the end of 'high ligation' of the sac been regarded as axiomatic. Recurrence of indirect inguinal hernia has often shown to be due to failure to find and extirpate the sac (Ferguson, 1978) and due to various techniques of hernial wall repair, recurrence rates continue to range between 1 and 10% (Lichtenstein, 1987). Impersonal reviews indicate that the recurrence rate remains excessively high and fairly constant whatever method and material is employed. The question at issue is whether, after the proximal sac is excised, the resulting peritoneal defect at the level of the parietal peritoneum should be closed by suture i.e. should ligation of the hernial sac be done routinely in every case or whether simply excising the proximal sac and leaving the resulting defect open would make any difference in postoperative pain and recurrence rates? If it can be proved that simply excising the hernial sac leads to no significant changes in the recurrence rates, then an unnecessary procedure which is being done can be omitted with the additional advantage of a significant reduction in the postoperative pain. What remains after excision of the sac is a peritoneal defect. It has been demonstrated in animal studies and in clinical experience that the closure of laparotomy wounds without suture of the peritoneum has not affected healing. Clinical observation show that raw peritoneal defects heal rapidly (Ellis and Hedde, 1977). If leaving the peritoneum open makes no difference to abdominal wound healing then this unnecessary routine can be given up and therefore also ligation of the hernial sac. The hernial sac consists of a single layer of mesothelium. It is unreasonable to assign a crucial role to a structure of such insignificant strength in the repair of adult inguinal hernias. Co-existent fascial deficiency has been shown to always precede peritoneal protrusions (Lichtenstein, 1987). These findings suggest that peritoneum in recurrent hernias is nothing more than a passive space filler. Traditional methods of hernia repair have varied little since its first description by Bassini. In 1884, he performed the first true

inguinal floor reconstruction. Five years later, he documented a recurrence rate well under 10% (Sabiston Jr.). There has been little recorded since then to indicate marked improvement in these results. Newer concepts, modern materials and recent experimental evidence invite re-evaluation of established surgical tenets. Despite the certainty of iconoclastic criticism, it is time to challenge some of the myths surrounding hernia repair.

MATERIAL AND METHODS

Patients attending the outpatient department complaining of hernial projection were examined. Patients who were otherwise healthy except having indirect inguinal hernia were selected for the study. Patients who were not selected for the study, included: - Bilateral hernias, Direct hernias and Recurrent hernias. During surgery, the diagnosis of indirect hernia was confirmed and patients with selection criteria were only taken for the study. Thus, the finding at operation was the final point of selection.

Selected patients were operated by standard inguinal approach with division of sac in each case at the neck. No attempt was made to transect the neck. The peritoneum was then allowed to fall back and a standard Bassini's repair using 2/0 prolene was done in each case.

Post-operative management

Post-operatively, no special precautions were taken. No extra care was given to any patient. No tight strapping of the operation site was done and mobility was commenced at the earliest. The post-operative pain was assessed by the following criteria. Mild pain - no analgesic required, Moderate pain - oral analgesic required, Severe pain - injectable analgesic required. During the stay of the patients in the hospital, they were also observed for any immediate prolapse of the abdominal contents, a local bulge, hematoma, wound infection or any other complication. Patients were followed up for a period of one year in my own study and for a period of two to five year of previous studies.

RESULT:

Since the start of study from August 1993 till 1997 a total of 30 cases of indirect inguinal hernia have been studied in department of surgery M.L.B. Medical College, Jhansi. Further 5 patients were studied from December 1997 to December 1998. Here the details of previous study along with present study are shown.

Table 1: Age distribution of patients

Age group (years)	No of cases		Percentage of total cases
	Previous study	Present study	
0-10	4	1	14.2%
11-20	3	2	14.2%
21-30	8	1	25.7%

31-40	10	1	31.4%
41-50	4	---	11.4%
51-60	1	---	2.8%
Mean age	26.45		

Table 2: Distribution of patients according to sex

Sex	Previous study	Present study	Total no of cases
No of cases	30	5	35
Male	27	5	32
Female	3	---	3
Male to female ratio	10.7:1		

Table 3: distribution of patients according type and side of hernia

Type and side of hernia	Previous study	Present study	Total no of cases	Percentage
Direct	---	---	---	---
Indirect	30	5	35	100%
Right side	20	4	24	68.57%
Left side	10	1	11	31.43%

Table 4: Distribution of patients according to size of neck

Widening of neck	No of cases		Total no of cases	Percent age
	Previous study	Present study		
No widening of neck	4	1	5	14.28%
Small to moderate widening	24	4	28	80.0%
Large neck	2	---	2	5.71%

Table 5: Distribution of patients according to type of operations

Type of operation	No of cases		Total no. of cases	Percentage
	Previous study	Present study		
Herniotomy	4	1	5	14.28%
Herniorrhaphy (Bassini's type)	26	4	30	85.71%
Hernioplasty	---	---	---	---

Table 6: Showing postoperative pain

Post op. pain (day)	Mild			Moderate			Severe		
	Pre. Study	Pr. Study	%	Pre. Study	Pr. Study	%	Pre. Study	Pr. Study	%
1 st	6	1	20%	3	01	8.5%	21	4	71%
2 nd	18	4	63%	8	---	26%	4	---	11%
3 rd	24	5	83%	5	---	14%	1	---	3%
4 th	27	---	77%	2	---	5.7%	1	---	3%
5 th	30	---	86%	---	---	---	---	---	---
6 th	---	---	---	---	---	---	---	---	---

Table 7: Showing the postoperative complications

Complication	No of cases		Total no. of cases	Percent age
	Previous study	Present study		
Haematoma	---	---	---	---
Wound infection	1	---	---	2.85%
Dehiscence	---	---	---	---
Oechitis	---	---	---	---
Local bulge	---	---	---	---
Others	---	---	---	---

Table 8: Showing postoperative hospital stay

Post operative hospital stay (in days)	No of cases		Total no. of cases	Percentage
	Previous study	Present study		
0-3	---	2	2	5.71%
4-5	3	1	4	11.42%
6-7	26	1	27	77.14%
8-10	1	1	2	5.71%

Table 9: Showing the recurrence of hernia

Follow up period (years)	No of cases		Total no. of cases	Percentage
	Previous study	Present study		
4				

0-1	3	Nil	Nil	Nil
2-3	11	Nil		
4-5	5	Nil		

DISCUSSION

No abdominal surgeon disagrees with the fact that excision of the proximal part of the indirect inguinal sac is essential in the treatment of hernia (Ferguson, 1978). The patent processus vaginalis may be the only abnormality preceding herniation and the smooth peritoneal tract appears to invite visceral protrusion. The excision of that part of the sac that traverses the abdominal wall back to the level of the parietal peritoneum is an essential part of any type of surgical repair. At autopsy of 20% of adult males a patent peritoneal sac, with no history of having had a hernia, was observed (Connor and Peacock Jr. 1973). Therefore, a patent processus vaginalis cannot be the cause of hernia, nor can its elimination per se, be the cure.

Recurrence of indirect inguinal hernia has often been shown to be due to failure to find and extirpate the sac. Many have documented other reasons for recurrence. Only a few have however, stressed the fact that only excision and not ligating the hernial sac cause no different recurrence rates as shown by standard randomized trials (Ferguson, 1978).

The distal part of the sac however, need not to be removed when it is so large that additional dissection would be needed.

The question at issue is, whether after the proximal sac is excised, the resulting peritoneal defect at the level of the parietal peritoneum should be closed by suture as has been taught and traditionally practiced by abdominal surgeons or can be left as such.

The literature contains many affirmatives by experienced surgeons concerning the importance of high ligation of the hernial sacs. Some have even advocated translocating the ligated stump by suturing it to the transverse layer away from the internal ring. These surgeons properly concerned with the importance of treating the sac, apparently did not consider the alternative of simply excising it. We at this institution, have done this though in only 35 patients with gratifying results.

Age and sex distribution:

In the comparative study of 110 patients by Smedberg et al (1984), of which 57 patients were treated by non-ligation and 53 patients by ligation of the hernial sac. All patients were males under the age of 65 years, with mean age of 43.5 and 43.9 years of non-ligated and ligated group of patients respectively.

In the study by Lichtenstein (1987) the total number of patients included were 6321. Age of the patients ranged from 14 to 96 years. Male patients predominated in whom 50% had indirect and 50% had direct inguinal hernia. Non-ligation was done only in all indirect hernia (50%) cases.

In the study by Donald J Ferguson, 34 patients were examined. Age ranged from 5 months to 84 years. All had indirect inguinal hernias. No sex preference is mentioned and all patients were treated by non-ligation.

35 patients were chosen from age 6 months to sixty years with mean age of 26.25 years for our study.

Type of hernia:

Smedberg et al performed their study in all indirect hernias. In Lichenstein Hernia Institute series of 6321 patients, 50% patients had indirect hernia.

Donald J Ferguson performed in all patients with indirect hernia.

In the present study also, all patients only of indirect inguinal hernia were included.

Size of neck (as determined by deep inguinal ring:

In the study of Smedberg et al, patients were treated according to the following recommendations.

When there was no widening of the deep inguinal ring, no repair was made. When a small or moderate widening of the deep ring was

present, a fascia transversalis repair according to Marcy was made and when the defect was large, a Coopers ligament hernioplasty according to MC Vay was made. In 10 cases, no repair was made because there was no widening of the deep ring. A Marcy repair was done in 78 cases and Mac Vay repair in 16. In 6 cases a Bassini's repair was done.

In Lichtenstein series no consideration was placed on the deep ring and a Bassini's type variation with polypropylene mesh was employed in all patients.

In the special comments by Ferguson, no mention is made of the deep inguinal ring.

Consideration of the deep ring was made for our study as per the study of Smedberg et al.

28 patients (80%) chosen had small to moderate size of deep ring five patients (14.2%) had no widening of deep ring and two (5.7%) patients had large deep ring.

Type of operation:

Smedberg made a repair according to Marcy. When a small or moderate widening of the deep ring was present, a fascia transversalis repair according to Marcy was made and when the defect was large, a Coopers ligament hernioplasty according to MC Vay was made.

Lichtenstein performed Herniorrhaphy in all 6321 patients. No specific procedure is mentioned. Repair was achieved by a single layer approximation of transversus abdominis ligament to Poupart's ligament.

Herniotomy was performed in 5 of our patients (14.2%) and Bassini's repair was performed in 30 patients (85.7%) using 2/0 Prolene.

Material for repair utilized

No specific material, used in herniorrhaphy is mentioned in any of the above-mentioned studies. In our study, 2/0 Prolene, was used for herniorrhaphy in 30 patients (85.7) with indirect inguinal hernia.

Post Operative Pain

In the comparative study of Smedberg et. al. post-operative pain was assessed at 2 and 6 weeks. It was observed that two weeks postoperatively there was no difference between the groups concerning moderate pain but in the ligated group there were five patients with severe pain as compared with none in the non-ligated group, a difference that was significant.

Six weeks postoperatively there was significant difference in moderate pain amongst the non- ligated and ligated groups. Five patients in the non-ligated group while 20 patients in the ligated group experienced moderate pain two weeks postoperatively.

In Lichtenstein's series, though no period is mentioned for assessment of pain yet they found a relative absence of pain postoperatively. 89.5% of the patients did not require hypodermic administration of narcotic for analgesia, possibly meaning that they have either no significant pain or a mild pain which did not require analgesia. Ferguson did not analyze the pain.

The severity of pain was divided into mild pain requiring no drug, moderate pain requiring only oral analgesics and severe pain requiring injectable analgesics and the pain was assessed for the first 6 days till most patients were discharged.

On the first day out of 35 patients 25 patients (71.4%) experienced severe pain and they required injectable analgesics, 3 patients (8.57%) experienced moderate pain, required oral analgesics. However, 7 (20%) patients experienced only mild pain and required no analgesic. There was dramatic change on the second day, only 4 patients (11.4%) experienced severe pain and required injectable analgesics and rest patients experienced mild to moderate pain. On the third day 29 (82.85%) patients experienced mild pain and required no analgesics and 5 patients (14.2%) required oral analgesics and only one patient (2.85%) was on injectable analgesic. On the fifth post- operative day all but 5 patients complained only mild pain and required no analgesic. Only 5 patients did not complain any pain. Then, on the 6th day onwards no complained about pain whatsoever.

Post operative hospital stay:

Smedberg et. al. did not mention about post-operative hospital stay but they have assessed the period off work. They showed that the average time off work was 3.4 and 3.8 weeks in the non- ligated and ligated groups respectively, in favor of non-ligature a significant difference.

During our study, 2 patients were discharged on third post-operative day, 4 patients on fourth post-operative day and hospital stay was extended more than 7 days only for 2 patients. The remaining two patients were discharged one on 8th day and one on 10th day. No other study has mentioned the post-operative stay in the hospital.

Complications (immediate post-operative):

In Smedberg et. al. study group there was no bleeding or other complication from the non- ligated peritoneal sac. In the ligated group, there was one case of wound infection and one patient had epididymitis 3 weeks post operatively, no sinus developed.

In Lichtenstein's series, there was no increase in the incidence of hemorrhage, wound infection or other complications. In Ferguson series, no mention has been made of the immediate post- operative complications. In our study for 5 years (continuous study) only one patient (2.8%) suffered from wound infection, however, it cleared off by 10th day.

Follow up and recurrence:

In the study of Smedberg et.al., patients were followed up for three years. They have assessed recurrence at 2 weeks, 6 weeks, at the end of one year and between 1 and 3 years. After 2 and 6 weeks, no clinical recurrences were found in the two groups. one recurrence appeared in each group within one year post-operatively. One year or later postoperatively, two recurrences were found in the group without ligation and one in the group with ligation. Number of recurrences and new hernia (Clinical and Herniographic findings)

In Lichtenstein Hernia Institute series, 91% patients were followed up between 2 to 14 years. The recurrence rate was 0.7% suggesting that the omission of high ligation of the hernial sac had no apparent adverse effect on the results. Of the 43 recurrences one appeared within a year of operation. There was no evidence to suggest that unrestricted physical activity in the immediate post-operative period contributed to the development of any recurrence. Excessive tension on the suture line was the prime cause of failure. In the Ferguson series, 8 patients were followed up less than one year and 26 patients were followed 1 to 7 years. He found that there was no obvious increase in recurrence rate. In the study (ref. 20) the relevant follow up of such cases is usually for the next 7 to 10 days for any complication is to happen, because of omitting of ligation of sac, it would appear in next 7-10 days. The long-term complications, especially, recurrence, would be a reflection of the repair rather than the non- ligation of sac.

During the period of 5 years of our study, because of limitation of socio-economic conditions of this region, only 19 patients (54.2%) could turn up for follow up with in a period of 1-5 years of study No patient had shown any recurrence so far.

CONCLUSION:

1. A controlled clinical study on 35 patients of indirect inguinal hernia has been conducted for the period of last five years.
2. The step of trans fixation and ligation of sac at the neck has been abandoned.
3. Standard Bassini's repair using 2/0 Prolene was done in 30 (85.7%) patients.
4. In five children, only herniotomy was done.
5. No post-operative complication was encountered except in one case.
6. No recurrence occurred during the period of study.
7. Possible advantages are
 - a. No chance of damaging cord structures in an attempt to do a high ligation of the sac.
 - b. No chance of entrapment of abdominal contents in ligature.
 - c. Lessens operative time.
 - d. Less post operative pain requiring less analgesics.

Hence it can be concluded that trans fixation and ligation of sac at the neck is not essential or axiomatic and can be safely abandoned.

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