

MESH REPAIR OF INDIRECT INGUINAL HERNIA

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ABSTRACT : *There are various ways to repair posterior wall of inguinal canal. In 30 cases of indirect inguinal hernia reconstruction of the posterior wall was carried out by polypropylene mesh without suturing it with surrounding structures. The operative technique did not showed any difficulty and the recovery remained uneventful. Two and half yeasrs follow up did not show any recurrence so far. So we conclude that mesh repair is simple, safe and can be recommended for indirect inguinal hernia.*

KEY WORDS : *Hernia, Inguinal, Repair.*

INTRODUCTION

The fundamental difference in the structure of the anterior abdominal wall which allows inguinal hernia to develop is related to a deficiency in the fascia of the transversus abdominis muscle. If this layer remains intact, it is unlikely that a hernia will ever develop. As an indirect inguinal hernia develops, it progressively stretches the internal inguinal ring and reconstruction of this fascial ring is fundamental to the success of repair.

Considerable debate ensues when the best method of repair is considered. There is a general tendency to treat small indirect hernias differently from those with large direct sacs and direct hernia. Bassini in 1887 presented his legendary contribution to the annals of surgical technique for this common disease. Halsted, Marcy and other surgical contemporaries also broadened the base of anatomical and surgical knowledge with their contribution to matters of surgical technique¹. Modifying the procedures of these great surgeons next came the famous Shouldice repair. In spite of these repairs, surgeons keep on modifying and developing new procedures.

More recently, the value of prosthetic support to the posterior wall of the inguinal canal and the internal ring has been appreciated by many authors. The prosthetic repair of inguinal hernia may be inguinal, preperitoneal or laparoscopic. Absorbable and non absorbable meshes have been used in primary and recurrent hernia routinely in some centres of the world.

The new era of using the non absorbable mesh of poly-

propylene without stitching it with the surrounding tissues is another milestone in primary and recurrent indirect inguinal hernia repair. This technique is used to repair those cases where the inguinal ring is broadened upto two fingers but posterior wall is not distorted.

PATIENTS & METHODS

This study included 30 cases with a follow up of two and a half years. Adult male patients with small and medium sized indirect inguinal hernia were selected for the study. Female patients, children, patients with large inguinoscrotal indirect hernia, direct inguinal hernia, femoral hernia, sliding hernia and obstructed/strangulated hernia cases were excluded.

After exploring the inguinal canal, the spermatic cord was mobilized and the coverings cleared to expose the hernial sac. The cremastic muscle and fascia medial to the internal inuinal ring was transected to expose the internal ring. After the sac was dealt with, a 5cm x 5cm piece of polypropylene plug was inserted in the internal ring. In that position except for the spermatic vessels and vas deferens internal ring was completely blocked for future herniation. No sutures were used to hold the graft.

A second piece of polypropylene mesh of about 6cmx 6cm was placed over the transversalis fascia to enforce the posterior wall of the inguinal canal. It is positioned inferior, medial, superior and lateral to the internal ring, through a slit in the mesh. The cord is replaced anterior to the overlying mesh. Superiorly it is positioned below the internal oblique and transversus abdominis (conjoined

tendon) and inferiorly with the inguinal ligament upto pubic tubercle. Suturing the overlay graft was unnecessary because placement of the spermatic cord over it and closure of the external oblique aponeurosis with absorbable suture secured the onlay graft to the underlying posterior wall. The wound was closed in layers.

RESULTS

Between April and October 1993 sutureless repair of small and medium sized indirect inguinal hernias was performed in 30 patients. All were males. Thirty two sutureless repairs were actually performed in 30 patients, as two cases had bilateral inguinal hernia. Out of 30 cases, 25 (83.33%) were primary hernias while 5 (16.66%) hernias were recurrent. Ages of the patients ranged from 18 to 62 years with a mean age of 40 years (Table 1).

Table 1. Age distribution (n=30)

Age (years)	No. of cases	Percentage
11-20	6	20.0
21-30	10	33.3
31-40	5	16.6
41-50	3	10.0
51-60	4	10.3
61-70	2	6.6

The internal ring was evaluated in all cases. It was found upto two fingers breadth in 23 (76.7%) cases and more than two fingers in 7 (23.3%) cases. The posterior wall of the inguinal canal was not distorted in any case. The patients were admitted in the ward and kept for a minimal period, mean hospital stay was four days. In two cases the hospital stay lasted for 7 days due to complications, one patient developed funiculitis and the other severe postoperative neuralgia.

Most cases received antibiotic half an hour before the operation followed by a 2nd dose 6 hours postoperatively. Analgesics were prescribed as per routine but the case with postoperative neuralgia received higher dosages for one week. Funiculitis and neuralgia occurred in early cases, probably due to over enthusiastic placement of mesh around the cord.

The patients were followed up for 30 months. Admittedly this period is short but no recurrence has been noticed so far. The compliance of patients was remarkable except for three cases (10%) who never turned up.

DISCUSSION

Bassini, Halsted and Marcy are pioneers of surgery of groin hernias. The basic aim was sound reconstruction or re-enforcement of the posterior wall of the inguinal canal¹. Bassini and Halsted used transversalis fascia plus the more superficial inguinal ligament and muscle/aponeurosis to close the ring for indirect inguinal hernia and the inguinal canal for direct hernia. Their technique, however, was subsequently modified by other surgeons who had ideas of repairing the inguinal canal, which focused on exactly what muscular aponeurosis should be sutured to the inguinal ligament, how it should be sutured, with or without transposing the cord and with or without imbricating the external oblique aponeurosis². All these techniques have offered at best only temporary improvement. The failure of a repaired hernia to recur within one year was considered a major surgical triumph.

Hernial lesions are diverse and call for diverse methods of repair, if the herniorrhaphy provides a permanently strong scar that overlaps viable structure creating living collagen with no tension and correct oxygenation^{3,4}. Whenever repair is done under tension, it impedes tissue micro circulation, decreases local tissue oxygen tension and interferes with proper hydroxylation of proline and lysine. So the important points in repairing indirect inguinal hernia are better understanding and visualisation of anatomical defect and width of internal ring with de-ranged posterior wall, meticulous dissection of the fascial covering the sac and internal ring, the ring should be properly handled and repaired and the reinforcement of transversalis fascia and posterior wall of inguinal canal done without any tension.

It is said that atleast 6 months of healing and remodeling of the aponeurosis is required before there is adequate strength in a hernia repair so the choice of suture material is important. Different sutures have different characteristics, polyglactin and chromic catgut loose 60% of their strength within 20 days of insertion. Similarly silk, polyesters and stainless steel wire are not suitable for hernial repair⁵.

The recurrence rate of repair with tension (Table 2)⁶ brought the idea of tension free or tension less repairs and different biomaterials became popular. One of these is polypropylene (prolene) which is considered best by many surgeons^{7,8}.

Prostheses are being used by many with promising results⁶. The preperitoneal approach used in one study with a followup of 15 months revealed no recurrence⁹ but still

Table 2. Recurrence Rate after Different Repairs of Inguinal Hernia*

Author	Technique	Hernias operated upon	Followup duration (Years)	Recurrence rate %
Baumber	Lytke	234	6-11	12.2
Callum	Bassini	186	5-12	7.5
Warlamont	Bassini	91	1-10	15.8
Gear	Halsted	1048	—	11.0
Obner	Shouldice	114	1-20	1.0

* Cited from Stoppa, et al⁶

this approach has many limitations⁶, testicular atrophy and painful sequelae are reported. With onlay graft of non absorbable mesh in recurrent as well as primary indirect inguinal hernia through inguinal approach, results are promising. In one study of 11 years experience the results are good, recurrence rate is low (2%) and complications are few¹⁰. Another study shows recurrence rates less than 11%. The good results compelled surgeons to use the polypropylene mesh routinely which is also popularized by Lichtenstein¹¹ and others¹².

In this study, the placement of polypropylene mesh through and immediately deep to the internal ring after dealing with the sac cures indirect hernia with mechanical effect and later on allow fibroblasts to go through its interstices.

This sutureless repair of small and medium sized indirect inguinal hernia allow for placement of a mesh in a location that most closely resembles the normal anatomical situation. It does not alter the sling and shutter mechanism which used to be damaged by iotrogenic erraneous suturing of the tissues snuggling the internal ring¹³. Besides future collagen weakness due to aging degeneration and causing direct herniation is cured by placing onlay graft, allowing anterior tissue to be closed in a tension free manner.

CONCLUSIONS

Prosthetic repairs are an important development in herniology because of their excellent results. The small and medium sized indirect inguinal hernias are effectively repaired with plugging the ring without suturing the mesh patch. No untoward damage or morbidity is expected as no suture is applied. This avoids the iotrogenic errors of commision and preserve the sling and shutter mechanism. Though the results are comparable with any other repair, but as regard to the future of this technique we do not believe that randomized studies comparing different techniques will lead any one to an exclusive choice as hernias

Table 3. Recurrence Rates after Inguinal Patch

Authors	Prosthesis	No. of Hernias operated	Followup duration (Years)	Recurrence rate %
Bapat*	Steel	95	0.5-5.5	1.0
Cerise*	Dacron	100	1-4.5	1.0
Martin*	Marlex	365	1-10	0.0
Gilbert ¹³	Prolene	412	2-3	0.4
Barnes ¹⁰	Marlex	102	6	2.0
Present Study	Prolene	30	2.5	0.1

* Cited in Stoppa, et al⁶

are polymorphous lesions. Although the prosthesis gives virtually immediate definitive results, repair should be intact many years after this operation whereas this study has a short followup (Table 3). This technique is any how easy, reliable and low cost with less complications. The procedure has proved quite satisfactory and with a short learning curve. We recommend this technique for small and medium sized, primary and recurrent indirect inguinal hernia. It is impossible to ignore the remarkable possibilities offered by prostheses in the surgical treatment of hernias.

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