PROSPECTIVE STUDY ON DARNING AND LICHTENSTEIN MESH HERNIOPLASTY (LMH) IN INGUINAL HERNIA REPAIR

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ABSTRACT

INTRODUCTION

Prospective study on Darning and Lichtenstein Mesh Hernioplasty in Inguinal Hernia Repair is a study of 61 cases of inguinal hernias which were treated by either open Inguinal hernia mesh repair (Lichtenstein) or darning repair. The study was conducted with an objective to compare the effectiveness of these procedures and complications if any.

61 cases of inguinal hernia admitted in Yenepoya Medical College Hospital, Mangalore were selected on the basis of the non-probability (prospective) sampling method. All patients with uncomplicated direct and indirect hernias treated by darning or mesh repair were included. After preoperative preparation they were randomly chosen for darning or mesh repair. The age/sex incidence, mode of presentation, precipitating factors, surgical treatment and postoperative complications were all evaluated and compared with standard published literature.

The total number of postoperative complications was reported in 13.9% patients, complications was high after Mesh repair when compared to Darning. Seroma was the most common complication followed by funiculitis and wound infection. There was one recurrence each noted till date in the two groups under study. Darn repair is equally effective and much less costly treatment for inguinal hernia than mesh repair which had more risk of infection.

KEYWORDS

Inguinal hernia, Darning, Lichtenstein, Post-Operative pain, Wound infection, Haematoma, Recurrence.

MeSH TERMS

Darning, Lichtenstein hernioplasty.

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INTRODUCTION: Inguinal hernia repair accounts for 10-15% of all surgical procedures. It is doomed to be a failure unless rendered tension free. It constitutes 73% of all external hernia. Of the study of the many operations available in a general surgeon's armamentarium, that of hernia repairs has been written about repeatedly.[1] The rapid changes that have been witnessed in open approach surgeries, prosthetic materials and laparoscopic surgeries have made hernia surgery, a most interesting field of endeavour that demands renewed discipline and dedication.[2] Though a variety of procedure are performed none can be termed as an ideal procedure as each one is accompanied by varied early and late complications, the most significant being recurrence. In 1981, William Bull, one of the most prominent Surgeons, wrote of hernia repairs, "It is wise to estimate the value of given procedures by the relative proportions of relapses".[3] In our Institutions, inguinal hernia repair is one of the common surgeries performed daily. This study aims at studying the efficiency, advantages, disadvantages, limitations, post-Operative pain, duration of hospital stay and the cost effectiveness between the Lichtenstein mesh repair and Darning inguinal hernia mesh repair surgeries and to arrive at a conclusion as to the best modality of treatment after comparison of morbidity and recurrence of these procedures among them and in relation to standard published material.

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MATERIALS AND METHODS: The present study is a prospective study of 61 cases of inguinal hernia admitted in Yenepoya Medical College Hospital, Deralakatte, Mangalore the study period of 1st may 2010 to November 2012. 61 cases for the purpose of the study were selected on the basis of the non-probability (purposive) sampling method.

The inclusion criteria were patients with unilateral or bilateral inguinal hernia with reducible and non-obstructive hernias are included in the study. The exclusion criteria are all patients who presented with complications of inguinal hernia like obstruction and strangulation are excluded from the study. Also cases that have been previously operated are excluded from the study. All the patients included in the study shall be evaluated to a through history and physical examination. In addition to routine blood and urine investigations. Other investigations are also done if required. Radiographic procedures like USG and ECHO are recommended if it is indicated for certain patients.

Preoperative treatment included-correction of anaemia, weight reduction if obese, improvement of nutritional status, treatment of respiratory infection if any, abstinence from smoking/alcohol, advice regarding breathing exercises.

The type of anaesthesia used was spinal anaesthesia for both groups.

The patients were randomly chosen for Mesh repair and darning repair. A single dose of preoperative broad spectrum antibiotic given followed by the same for 3 days postoperative.

Analgesics-Injection Diclofenac Na was given postoperatively for 2 days and later SOS.

The patients were discharged when fit and asked to come for regular follow up after 7 days 1,3,6,9,12 months postoperatively. Different patients were followed up for different periods with many dropouts. The patients were advised to return to prehernia lifestyle except lifting heavy weights. All were followed-up for post-operative pain, interference with activities of daily living, use of analgesics, visit to a GP and recurrence. The age/sex incidence, mode of presentation, precipitating factors, surgical treatment, post-operative complications, cost of the treatment, hospital stay, time until return to work were all evaluated and compared with standard published literature.

STATISTICS: Statistical methods applied were descriptive, Crosstabs, Chi-square and Independent-samples T test. SPSS for windows version-16 92007 was employed for statistical analysis.

RESULTS: In our study the incidence of hernia was common in the younger age group, greatest in the 45-64 age group and all the patients in our study where men. The occurrence of hernia is common among the farmers and labourers accounting for 54% in comparison to other occupation like teacher or businessman. 90.2% patients presented within the first 1 yr. of onset of complaints while 9.8% of them presented after 1 yr. In our study 26.2% were smokers and 73.8% non-smokers. The incidence of hernia was more common in people who undertook strenuous work accounting for 55.7% of cases. 11 of the patients suffered from hypertension while 4 of them had illness like diabetes mellitus. Right indirect hernia was seen in 21 cases being the most frequent on in our study 31 cases underwent Lichtenstein hernioplasty while 30 cases underwent darning repair. They were randomly selected for the different surgeries. Severe pain was complained in 6 cases of Lichtenstein hernioplasty and 1 case of darning repair, while 18 cases of darning repair had mild pain. Post-Operative wound infection developed in 1 case of Lichtenstein hernioplasty and none in the Darning repair group. Hematoma at the operated site was found in one case of Lichtenstein hernioplasty. Seroma occurred in 4 cases of Lichtenstein hernioplasty and 2 cases of darning repair. The duration of hospitalization was 9.03 days in case of Darning repair and 9.10 days in case of Lichtenstein hernioplasty. There was a mean difference of Rs. 1183.28 between the 2 groups of surgery. Hence Lichtenstein hernioplasty was not cost effective. There was 1 recurrence noted in each group. Repair of inguinal hernia is one of the commonest operations performed by surgeons around the world. The treatment of this common problem has seen an evolution from the pure tissue repairs to the prosthetic repairs and in conventional open repairs to laparoscopic approach. The fact that the so many hernia repairs are practiced in a testimony to the fact that probably none is distinctly superior to the other. However there is no still agreement about which operation is preferable in a given situation and the reported cumulative recurrence rate varies widely from 1% in special centers to 30% sited in reviews. Quality assessment of hernia surgery is essential. It is necessary for education and for evaluation of new methods for surgeon and surgical units, quality assessment is necessary for improving and defending achievements. We have a long way to go in order to make hernia repair a "once in a time experience" for the patients

DISCUSSION: The Latin word hernia means a rupture or tear.[4] A hernia is a protrusion of a viscus or part of a viscus through an opening in the wall of the cavity in which it is contained.[5] The inguinal canal is an oblique intermuscular slit about 4 cm long lying above the medial half of the inguinal ligament. It commences at the deep inguinal ring and ends at the superficial ring.[6] It is directed downwards, forwards and medially. In infants, the superficial and deep inguinal rings are almost superimposed and obliquity of the canal is slight.[7]

The deep ring is a U shaped condensation of the transversalis fascia and it lies 1.25 cm above the inguinal ligament midway between the symphysis pubis and the anterior superior iliac spine.[7] The superficial inguinal ring is a triangular aperture in the aponeurosis of the external oblique and lies about 1.25 cm above the public tubercle. The ring is bounded by superomedial and inferolateral crus joined by crisscross antecrural fibres. Normally the ring will not admit the tip of little finger.[7] The inguinal ligament is the folded lower border of the aponeurosis of the external oblique presenting a grooved superior abdominal surface (the floor of the inguinal canal), and which stretches from the anterior superior iliac spine to the pubic tubercle. It has variously been called the crural arch, superficial crural arch, and Poupart's ligament.[8]

Hernias of the abdominal wall occur only in area where aponeurosis and fascia are devoid of the protecting support of striated muscle. Without a counteracting force, the rare aponeurotic areas are subjected to ravages of intra-abdominal pressure and give way if they deteriorate or contain anatomical irregularities. Predictably, the common sites of herniation are thus the groin, the umbilicus, the linea alba, the semilunar line of Spieghel, the diaphragm and surgical incision. Other similar but rare sites of herniation are the perineum, the superior lumbar triangle of Grynfeltt, the inferior triangle of Petit and the sciatic foramina of the pelvis.[9]

Indications for operation are 1. All inguinal hernias in children should be repaired without delay because of the risk of complications of incarceration and strangulation, (it has been estimated that the complication rate when operating urgently for a strangulated hernia in a child is 20 times that of a planned surgery). 2. In adults, the risk of a hernia operation is negligible and the recurrence rate, when a good

repair has been done, is so small that there is hardly any reason for not operating on all hernias as soon as they are diagnosed. 3. Gardner, in his series of patients more than 80 years of age operated for inguinal hernia both electively and as emergencies showed that deaths were the results of complications of primary hernia rather than associated diseases indicating that one should treat hernias in the elderly early before the complications develop. 4. The small, wide necked direct inguinal hernias in elderly patients that pop out and back on coughing can be left alone unless they show signs of growing.[10]

The three main principles in the management of the inguinal hernia are[11] 1. The normal anatomy should be reconstituted as far as possible. The first layer to be defective in either indirect or direct hernias, is the transversalis fascia, this should therefore be repaired first. 2. Only tendinous/aponeurotic/fascial structures should be sutured together. 3. The suture material must retain its strength for long enough to maintain tissue apposition and allow sound union of tissues to occur.

Reconstructive procedures are 1. The modified Bassini repair 2. The shouldice repair. 3. The Lichtenstein Tension-free repair 4.The polypropylene hernia system, the Darning.

The darning: The nylon darn repair also called "poor man's mesh" is a suture repair that introduced the concept of a tension-free repair. In the beginning of the 1900's, various surgeons used pedicled strips of the external oblique aponeurosis or fascial grafts from the thigh for their repairs. This led to the idea of a lattice or darn suture repair. The plication–darn technique was formally described by Moloney in the 1950's. The technique was revised and further popularized by Abrahamson in the 1980's.The theory behind the nylon darn repair is that the latticework of suture provides a tension free repair. This procedure was originally described by Moloney.[12] In the west laparoscopy is now accepted as a common procedure for treatment. Darning is now preferred in third world countries where economic Considerations outweigh other factors in management of hernia. The first part of the repair involves closure of the transversalis fascia defect (plication without tension) and the second part involves the darn repair. In this repair, the transversalis fascia is not slit open. After ligation of an indirect sac or imbrication of a direct sac, the posterior wall of the inguinal canal is repaired. The repair involves using a continuous suture and starting laterally, just medial to the internal ring. The musculoaponeurotic arch is sutured to the inguinal ligament with no effort to forcibly bring the layers together (thereby avoiding tension).

The second suture line extends laterally from the pubic tubercle in a continuous fashion by taking good strong aponeurotic tissue from the rectus sheath and the tendinous portion of the internal oblique as the superior portion of musculoaponeurotic arch above to the inguinal ligament below. It is important to pass through the rectus sheath medially and the tendinous portion of the internal oblique laterally to ensure that strong tissue is used. Again the tissue is not forcibly brought together; the suture lattice instead works as a darn mesh. Abrahamson modified the technique by beginning the repair medially with an anchoring suture to the pubic fascia along with the medial part of the inguinal ligament, transversalis fascia, and transversus abdominis aponeurosis. Then using a simple continuous nylon suture, the iliopubic tract, few fibers of the inguinal ligament and lower portion of transversalis fascia are sutured to the upper portion of the transversalis fascia and lower edge of the transversus abdominis aponeurosis. In the area of the direct hernia, 1-3 extra bites are taken of the transversalis fascia along the edges of the tear to close it securely. For the darn portion of the repair, 3 nylon sutures are placed in a continuous fashion to form the lattice. They include the inguinal ligament inferiorly and superiorly include the rectus sheath and conjoined tendon. There is no tension placed on the sutures. The first suture is in a vertical direction, the second slopes cranially and medially, and the third slopes cranially and laterally. Similar to the Should ice repair, this repair needs to be seen and practiced many times, before one is well familiar with the technique.

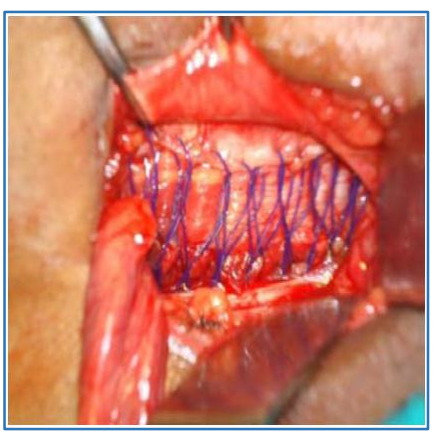

Fig. 1: After first row of Darning repair

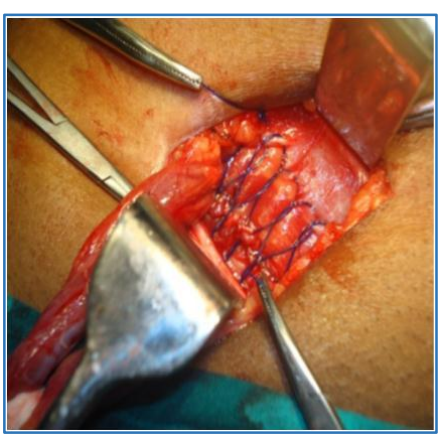

Fig. 2: After completing two rows of Darning repair

Characteristics	Surgery done	
	Darning	Mesh repair
Complications		
No complications	28(93.3%)	25(80.6%)
Funiculitis	0(0.0%)	1(3.2%)
Seroma	2(6.7%)	4(12.9%)
Wound infection	0(0.0%)	1(3.2%)
Total	**30(100%)**	**31(100%)**

Postoperative pain		
Mild	18(60.0%)	1(3.2%)
Moderate	11(36.7%)	24(77.4%)
Severe	1(3.3%)	6(19.4%)
Total	**30(100%)**	**31(100%)**
Time until return to work		
4-6 weeks	7(23.3%)	4(12.9%)
6-8 weeks	18(60%)	21(67.7%)
>8 weeks	5(16.6%)	6(19.35%)
Total	**30(100%)**	**31(100%)**
Recurrence		
No recurrence	29(96.67%)	30(96.7%)
Recurrence	1(3.3%)	1(3.2%)
Total	**30(100%)**	**31(100%)**

Table 1

Characteristics	**Surgery done**	**N**	**Mean**	**SD**
Duration of hospital stay	Darning	30	9.03	2.027
	Mesh repair	31	9.10	463
Cost of hospitalization	Darning	30	3123.33	229.006
	Mesh repair	31	4306.61	459.462

Table 2

CONCLUSION: The present study is a comparative study between the Lichtenstein tension free mesh repair and the darning repair. The study was conducted with an intension to compare the effectiveness of the different surgeries and complications if any. All patients were intensively monitored in the immediate post-Operative period and the complications noted. We found that there was a marked reduction in post-Operative pain in Darning repair Compared to Lichtenstein tension free mesh repair. Lichtenstein tension free mesh repair is also found to be costly when compared to Darning, because of the cost of the mesh. There was no difference noted in the recurrence rate between the two groups There were few limitations to the study, the duration taken for preparation of the patient from the time of admission to the time of surgery was normally around three to four days which led to an apparent increase in duration of hospitalization in both group. The learning curve for the surgeons resulted for prolonged duration of surgery in both the groups. There were few dropouts in the follow up period and since the study period.

1. Was for a short period, long term outcomes and results cannot be assessed and thus the follow up continues for these patients. To summarize there is no universal repair for groin hernia and no two surgeons will disagree to agree on that point. The availability of such an array of surgical techniques in the treatment of groin hernias is bound to confuse the younger surgeons. All techniques will have hard proponents as well as opponents, this is where the practice of evidence based medicine is very crucial and one should have close watch on the follow up results of any particular newer procedures. Till then one may practice a time honoured and a good surgical technique, which has the least recurrence rate that is handed over to them by their seniors, taking into account the cost factor which is still important in the developing country like ours and with the noble thought that the patient is not a guinea pig.

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