Original Article

Comparison of Half Size (6x5.5) Prolene Mesh with Full Size (6x11) Mesh in Inguinal Hernia Repair

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ABSTRACT

Objective: To compare the results of half size 6x5.5cm Prolene mesh with full size 6x11cm mesh in inguinal hernia repair in terms of cost and complications.

Study Design: Quasi experimental study.

Place and duration: The study was conducted at surgical department Unit-1, POF hospital Wah Cantt from May 2005 to May 2011.

Materials and Methods: After approval from the ethics committee of POF Hospital Wah Cantt, all the patients presenting to Surgical OPD with inguinal hernias from January 2005 to December 2011 were included in this randomized control trial. Informed consent was taken from the patients. Patients were divided into two groups by convenient probability sampling. In Group A patients, full 6*11cm sized commercially available Ethicon Prolene mesh was placed and in Group B, half of prolene mesh (6x5.5) was placed. Patients were followed up from 6 to 18 months and the results of both groups were compared in terms of infection, pain, seroma formation, recurrence and cost effectiveness.

Results: A total of 300 patients were included. Group A and B each consisted of 150 patients. All were male aged 45 to 65 years. Recurrence occurred in 1 patient in group B and in 2 patients in group A, 7 patients complained of groin pain in group B while 19 patients in group A, P =0.01. 7 patients developed seroma in group A and 1 in group B, 1 patient in each group got wound infection. Full mesh group's cost was double compared to the half mesh group.

Conclusion: Half mesh inguinal hernia repair has similar recurrence and infection rate but lower post operative pain and seroma formation as compared to full mesh hernia repair. It is safe and cost effective.

Key words: Inguinal hernia, Prolene surgical mesh, Complication, Wound infection, Chronic pain, Seroma.

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Introduction

Mesh repair is a standard repair for inguinal hernia. The mesh must be a permanent material large enough to produce a wide overlap beyond the defect's edges. A polypropylene or polyester mesh (5 X 10 cm to 7 X 15 cm) is generally used. Recently, manufacturers have shifted towards lighter, more porous constructions that maintain the strength of the repair and putatively reduce the inflammatory response.[1] With mesh use foreign body sensation and chronic postoperative pain have created a conflict about standard polypropylene mesh.[2] Newer lighter meshes have been produced to overcome these problems. Nevertheless, all lightweight meshes are more expensive than standard polypropylene mesh.[3] Different mesh configurations may be chosen, primarily based on surgeon's preference and training. The trend is to reduce the size of foreign body to reduce the complication without an increase in the risk of recurrence. The objective of our study is to assess the size of the mesh and its relation to complications (infection, seroma formation, chronic pain and recurrence) and cost.

Materials and Methods

The study was conducted at surgical department Unit-1 POF hospital Wah Cantt from May 2005 to may 2011 after approval from ethics committee. 300 patients with diagnosed inguinal hernia were included in the study. All patients were male, aged from 45 to 65 years. Patients with chronic cough, constipation, symptomatic BPH and recurrent inguinal hernia were excluded from the study.

Informed consent was taken from patients. Patients were divided into two groups by simple random sampling technique. In 150 patients, full mesh 6x11cm was placed and in the other group of 150 patients half of 6x11cm mesh was placed. In half mesh group, 2 patients were operated on each list, 6x11cm prolene mesh was cut transversely into half and each half placed in these two patients who were put on the list for that day. Each patient received one preoperative antibiotic dose of cephalosporin and two doses postoperatively. Standard Lichtenstien mesh repair was performed (a mesh was positioned and trimmed as necessary so that its medial rounded edge comfortably overlaps the pubic tubercle . The rounded lower edge of the mesh was fixed to the lacunar ligament with 3-0 Prolene suture and continued inferolaterally in running fashion along the inguinal ligament up to the internal ring. A slit was cut in the superior portion of the mesh in the shape of an inverted T, so that its two tails can be draped over and under to narrow the internal ring. The superomedial aspect of the mesh is secured with interrupted sutures to the rectus sheath and to the conjoint tendon at its upper portion). Mentioned, that the respective nerves were protected during the procedure. Surgery in all patients was performed under spinal anesthesia. The patients were mobilized the following day. Postoperative analgesia consisted of Paracetamol or NSAIDS or a combination of these. The usual duration of the hospitalization was 2 days. Patients were followed up in OPD at 1st week, 6th week, 6 months,1 year and 1 ½ years for complications. Southhampton scoring system was used for wound infection, history and physical examination for recurrence, seroma formation and pain. The data entered in SPSS version 16. Descriptive statistics were used to calculate means ± standard deviation for age. Chi-square test was used to compare the two groups in terms of outcome. P value < 0.05 was considered significant.

Results

A total of 300 patients were included in this study. All were males aged 45 to 65 years. In group A, age ranged from 45 to 65 years (mean age 56) and standard deviation was 6. In group B, age ranged from 45 to 65 years (mean age 55) and standard deviation was 6. In group A, 69 patients had right sided inguinal hernia and 81 patients had left sided inguinal hernia. In group B, 87 patients had right sided inguinal hernia and 63 patients had left sided inguinal hernia. Group A consisted of 150 patients in whom full mesh was placed. Group B also consisted of 150 patients in whom half mesh was placed.

Recurrence occurred in 1(0.66%) patient in group B and in 2(1.3%) patients in group A giving a P value of 0.5 so there is no statistical difference in recurrence in both groups. 7(4.6%) patients complained of groin pain in group B while 19(12.6%) patients in group A giving a P value of 0.01 showing statistical difference in chronic pain. 7(4.6%) patients developed seroma in group A and 1(0.66%) in group B giving a P value of 0.03 showing statistical difference in seroma formation.

01 patient in each group got wound infection giving a P value of 1 so there is no difference in wound infection of two groups. Full mesh group cost double than half mesh group. Price of the mesh was obviously half when 6*5.5 mesh was used. One mesh of 6x11cm by Ethicon Company cost 1000 rupees (dated 2005). Mesh used in half mesh group costing 75000 rupees, and full mesh group cost 150000 rupees.

Discussion

The description of the Lichtenstein tension-free mesh repair, about 16 years ago, opened a new era in groin hernia repair [4]. Postoperative pain is minimal, as a result of the tension-free technique. The method is very simple, effective, is associated with a very low recurrence rates and can be performed under local or regional anesthesia.[5,6]

A variety of prosthetic meshes are available to the surgeon. The ideal mesh properties are inertness, resistance to infection, molecular permeability, pliability, transparency, mechanical integrity, and biocompatibility. Absorbable mesh does not remain in the wound long enough for adequate collagen to be deposited, while multi-filament mesh can harbor bacteria. Monofilament mesh is the most popular presently in use with the various types of polypropylene having different characteristic advantages.[6]

A hernia mesh has certain features like material, strength, elasticity, density, pore size. Standard polypropylene mesh is most frequently used one. It is cheap, available in most institutions, non-absorbable, and strong enough to avoid recurrence. Nevertheless, some actual problems with mesh use like foreign body sensation and chronic postoperative pain have created a conflict about standard polypropylene mesh.[1] Newer lighter meshes have been produced to overcome those problems.[3] Nevertheless, all lightweight meshes are more expensive than standard polypropylene mesh.

Several recent controlled clinical studies have suggested that lightweight meshes may improve patient comfort.[7] Some objective findings in favor of lightweight meshes have also been obtained from laboratory experiments.[8]

To reduce the chance of recurrence, the mesh should extend 2 – 4 cm beyond the boundary of Hesselbach's triangle.[9] Use of half mesh can easily cover this weak area adequately .Average distance of the defect between superficial to deep ring was found to be 3.75cm Objective of the above discussion is to reduce the foreign body load. This can be done either by reducing the weight of mesh or by size of mesh. As there is no

other study to estimate the size of mesh with complications, we will compare our results with other studies using full mesh in terms of complications.

Infections are an uncommon postoperative complication. Skin flora is the most prominent etiologic organism. A systematic review of seven randomized trials of antibiotic prophylaxis for open inguinal hernia repair found pooled risks of infection in the prophylaxis and placebo groups of 3.1 and 4.7 percent, respectively.[10] Although this reduction in infection risk was not statistically significant, many surgeons routinely administer antibiotics prior to surgery. However, with the increasing problem of antibiotic resistance and low incidence of infection, this practice cannot be universally recommended. An additional argument for avoiding prophylactic antibiotics is that most inguinal hernia wound infections can be easily treated with a brief course (five to seven days) of an oral cephalosporin. In our study 0.66% got wound Infection in both groups. So comparing it in our study, there was low infection rate in both the groups. Size of mesh has no effect on infection rate.

Seromas and hematomas are not infrequent complications after anterior hernia repair. They occur either because a dead space was left in place of a large hernia sac that was reduced or because of bleeding or fluid collection in the subcutaneous space upon or after closure or by inflammatory response to mesh. In a randomized trial of surgery versus watchful waiting, 6.1 percent of patients undergoing surgery with an open mesh repair developed a wound hematoma, 4.5 percent developed a scrotal hematoma, and 1.6 percent developed a seroma.[11] In our study it is 0.66% and 4.6 % in half mesh and full mesh respectively. Size of mesh had effect on seroma formation, less the foreign body less inflammatory response, less seroma formation.

The prevalence of pain following hernia repair has been reported between 0 and 37 percent. [12, 13] In a survey of 2500 Swedish patients two to three years after primary surgery for groin hernia, 30 percent reported some residual groin pain, and 11 to 14 percent reported that the pain interfered with activities (sitting, walking). [14] In our study it is 4.6% and 12.6 %in half mesh and full mesh respectively. Comparing other studies, full mesh group in our study had similar percentage of pain but half mesh had low incidence of post operative pain.

Recurrences occur in 0.5 to 15 percent of patients depending upon the procedure. The frequency of recurrent hernias after surgery is a function of the type of hernia repair initially performed, the co morbidities of the patient, and the length of time from the original hernia repair.[15] In our study recurrence is 0.66% and 1.3% in half mesh and full mesh respectively. So there is no difference in recurrence in other studies and ours.

Conclusion

Half mesh repair is cost effective; with decreased incidence of, chronic pain, and seroma formation with comparable recurrence and infection rates .In a third world country like Pakistan reduction of cost of mesh to half is a significant advantage, especially with equal or better result as compared with full mesh. One can easily arrange for two patients to have an operation on the same day so that each half of the mesh can be used in both, or those patients with bilateral hernias.

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