

HERNIA MESH REPAIR: IS INFECTION A REAL THREAT OR JUST AN APPREHENSION

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ABSTRACT

Objective: To evaluate the frequency of infection in hernia mesh repair.

Material and Methods: A prospective observational study on 100 consecutive patients with different hernias was conducted. This study was done in Surgical "A" Unit, Khyber Teaching Hospital, Peshawar from April 2008 to April 2011. All cases above 25 years of age were included. Patients with acute complications of hernia, diabetes, hypertension and patients on steroids were excluded. The patients were then assessed for procedure related complications at one week, monthly for six months and then 3 monthly for the rest of the year.

Results: Out of 100 patients, only 5% developed wound infection, 3% superficial and 2% deep. All of them were treated conservatively without removal of mesh.

Conclusion: Post operative septic complications are minimal in patients who undergo elective open hernia mesh repair. The frequency of infection and mesh implant rejection can be reduced with good aseptic measures, meticulous surgical technique and appropriate prophylactic antibiotics.

Key Words: Mesh repair, Infectious complications, mesh related infections.

INTRODUCTION

The mesh repair has become a standard procedure for different types of hernias. Different types of meshes have been developed so far, consisting of polypropylene, polyester and polytetrafluoroethylene. It has reduced the recurrence rate¹ resulting in widespread acceptance of its use, both in open and laparoscopic mesh repair. Despite its increasing popularity, a number of complications are thought to be associated with the use of mesh². Amongst them the most serious complication is the development of mesh infection, the treatment of which may sometimes need mesh removal.

The incidence reported in different series is 1-8% which is influenced by the surgical technique, mesh type, associated co morbidities (diabetes, obesity & immunosuppression) and measures adopted to prevent infection³. Polypropylene mesh acts like a foreign body and prophylactic measures should be adopted to prevent deep wound infection. Regarding the spectrum of organisms, different bacteria have been isolated but the commonest are staphylococcus aureus followed by other species of staphylococcus and streptococci². Mesh related infection is a serious

complication of hernia mesh repair. This may sometimes need removal of the mesh which causes more morbidity to the patient. To prevent mesh related infection, different measures have to be taken alongwith antibiotic prophylaxis⁴ particularly against staphylococcus species³.

MATERIALS AND METHODS

This prospective observational study had 100 consecutive patients with different hernias. The study was conducted in Surgical "A" Unit of Khyber Teaching Hospital, Peshawar from April 2008 to April 2011. All cases above 25 years of age were included. Patients with acute complications of hernia, diabetes, hypertension and patients on steroids were excluded. All patients were admitted from outpatient department as elective cases. They were clinically assessed thoroughly and all necessary investigations were carried out. Injection Cefuroxime, 1.5 gm was given intravenously at the time of induction as prophylaxis. Injection Amikacin was added to injection cefuroxime for two days in the post operative period. The operation site was prepared with povidone iodine. Patients were operated and mesh repair was done by senior registrar or consultants using open technique without any drains. Early mobilization was encouraged in all cases. The majority of patients were discharged on the second post operative day after wound inspection.

All patients were reviewed in surgical OPD on the 8th-9th post operative day. They were followed for

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one year. Initially they were reviewed as outpatients on a monthly basis for the first six months and then every three months for the rest of the year. During their OPD visits, wounds were examined carefully for the

Table 1: Types of Hernia

Types of Hernia	Frequency & %ages
Left Inguinal Hernia	33 (33%)
Right Inguinal Hernia	24 (24%)
Para-Umbilical hernia	16 (16%)
Incisional Hernia	11 (11%)
Umbilical Hernia	8 (8%)
Epigastric Hernia	5 (5%)
Rec. Right Inguinal Hernia	2 (2%)
Rec.Left Inguinal Hernia	1 (1%)
Total	100(100%)

development of any complication. Patients showing signs of wound infection during their follow up period were admitted. Wound infection was defined using the Centers for Disease Control and Prevention criteria. In this definition, superficial infection occurs within 30 days after operation and involves only skin or subcutaneous tissues. Deep infection involves fascial and muscle layers and, when related to an operation where an implant is used, may occur up to 1 year after surgery.

Pus was taken from the surgical site infection and sent for culture and sensitivity. Patients were then started on empirical antibiotics along with local treatment of the wound. Later on antibiotics were changed according to culture and sensitivity report, if different from empirical antibiotics. The data of every patient was recorded on a proforma. The variables studied were demographic details, types of hernia, duration of surgery and their effects on wound infection. The statistical analysis of the data was done on SPSS version 16.

Table 2: Effect of different variables on hernia mesh infection

Variables Yes	Infection			
	No	Total		
	No. of patients	No. of patients	Count	P-value
Age of patients (years)				
< 49	4(4.0%)	70 (70.0%)	74 (74.0%)	0.74
50.00 +	1 (1.0%)	25 (25.0%)	26 (26.0%)	
Sex				
Male	1 (1.0%)	62 (62.0%)	63 (63.0%)	0.04
Female	4(4.0%)	33 (33.0%)	37 (37.0%)	
Types of Hernia				
Para-umbilical	2 (2.0%)	14 (14.0%)	16 (16.0%)	0.038
Umbilical	1 (1.0%)	7 (7.0%)	8 (8.0%)	
Inguinal	1 (1.0%)	57 (57.0%)	58 (58.0%)	
Incisional	1 (1.0%)	9 (9.0%)	10 (10.0%)	
Epigastric	0 (0.0%)	5 (5.0%)	5 (5.0%)	
Recurrent Inguinal	0 (0.0%)	3 (3.0%)	3 (3.0%)	
Duration of Surgery (min)				
< 40.00	1 (1.0%)	66 (66.0%)	67 (67.0%)	0.404
41-55	2 (2.0%)	20 (20.0%)	22 (22.0%)	
56+	2 (2.0%)	9 (9.0%)	11 (11.0%)	

RESULTS

A total of 100 consecutive patients were included in this study from April 2008 to April 2011. The mean age of the patients was 39.87 years \pm 12.300 SD with a range of 25-70 years. There was a male dominance with 63(63%) patients being males and 37(37%) females with a ratio of 1.7:1. The commonest type of hernia was inguinal followed by paraumbilical hernia. The distribution of different type of hernias according to this study is shown in Table 1. Out of 100 cases only 3% were recurrent hernias and all of them were inguinal hernias. The frequency of wound infection in our study was 5(5%). Most of the infections occurred in the second week of surgery after discharge from the hospital. The infection was mostly seen in middle aged females. The infection rate was significantly higher in para-umbilical hernias than other types of hernia with p-value of 0.038. Duration of surgery had no significant effect on the wound infection with p-value of 0.40. The effect of different variables on wound infection is shown in Table 2.

The commonest organism isolated was staphylococcus aureus. Most of these infections were superficial (3%) and effectively controlled with antibiotic therapy according to culture and sensitivity. Only 2% had deep wound infection which was treated with aggressive antibiotic therapy along with local wound care like drainage of pus and repeated dressings. So the failure of repair due to mesh rejection was prevented effectively.

DISCUSSION

In literature hernia repair evolution is well documented. In early days anatomic repair was done using natural or modified natural materials for reconstruction. Tissue based suture repair was associated with a high recurrence rate¹. The use of prosthetic biomaterials has reduced the recurrence rate of different abdominal wall hernias repair as compared to tissue based suture repair^{5,6}. The use of tension free mesh repair technique has become the method of choice for different abdominal wall hernia repairs. Hernia mesh repair is traditionally considered to be a clean operation. But follow up results of some of the prospective studies have shown an infection rate of 10% or even more which is not acceptable for a clean operation⁷.

Hernia mesh repair is associated with both infectious and non-infectious complications². The true incidence of mesh related infection is not known because every center has reported its own incidence and it varies from 0.7% to 15%^{8,9}. The composition and type of mesh seems to be responsible for these complications. It has been seen that multifilament polyester mesh and microporous mesh are associated with a higher infection rate than monofilament polypropylene and macroporous meshes^{10,11}.

The patient and operation characteristics may also affect the wound infection rate¹². Yerdel et al experienced a high wound infection rate of 9% in their study¹³. Significant risk factors for wound infection are age, gender, type and duration of surgery¹². In our study the infection was more common in middle aged females. Regarding effect of duration of surgery on mesh infection, some international studies have observed more infection rate with prolonged duration of surgery¹⁴. In our study all ventral hernias were repaired without using a suction drain possibly explaining the higher mesh infection rate observed in paraumbilical hernia as compared to other types of hernia repair.

Most of the wound infections are superficial and can be easily treated conservatively¹⁵. While deep seated mesh infections are a less common but dreaded complication which can sometimes lead to mesh rejection if not treated vigorously. The commonest organism isolated according to culture in this study was staphylococcus aureus. Mesh related wound infection may occur within 30 days to one year¹⁶. The fear of infection of non-absorbable mesh, urged the introduction of prophylactic antibiotics in clean surgical procedures like elective hernia repair with mesh¹². This practice is empiric rather than evidence based.

CONCLUSION

Post operative septic complications are minimal in patients who undergo elective open hernia mesh repair. The frequency of infection and mesh implant rejection can be reduced with good aseptic measures, meticulous surgical technique and appropriate prophylactic antibiotics.

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