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Original Research Article

A Hospital Based Retrospective Observational Assessment of Mesh Related Infections

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Abstract

Aim: The aim of this study was to analysis of mesh related infections in Bihar region.

Methods: A retrospective observational study was conducted in the department of General Surgery for 2 years and 100 patients were included in the study.

Results: Mesh infection was more common in males. Among 100 patients, 82 were males and 18 female patients. Majority of the patients were in the age group 40-50 followed by 50-60 age groups. The time of presentation after surgery was more after 5 months and 40% had co-morbidities. Antibiotic has used according to the protocol of our hospital; it was followed in 96 patients in the first surgery i.e., hernia repair surgery. Parenteral cephalosporin was used in 96 patients and amoxicillin- clavulanic acid in 4 patients. Antibiotic has repeated if the procedure was beyond 2 hours. After postoperative day 2, patients were switched over to oral antibiotics for three days. Likewise, during the second admission, i.e., when the patient was admitted with mesh infection, 96 patients were given cephalosporin, and 4 patients were given Piperacillin tazobactam. Polypropylene mesh was used in 85 patients, and the composite mesh was used in 15 patients who underwent IPOM.

Conclusion: Most of the patients took more than 5 months to report infection. Comorbidities were present in 40% patients and risk for complications after hernia repair is increased among patients with comorbid conditions. So, the proper selection of the patient, ensuring good control of comorbid medical conditions will prevent mesh infections.

Keywords: Surgeries, mesh, Infection.

Introduction

Within the last few years, the use of meshes has become standard procedure in hernia repair surgery throughout the world. Implantation of a mesh during the surgical management of this common problem has been found to reduce the rate of recurrence of a hernia. The use of a mesh for the repair of incisional hernias has been found in different studies to decrease the recurrence rates by an average of 30% [1-3], while in a randomised clinical trial involving 289 patients in which non-mesh vs. mesh repair of primary inguinal hernia was compared, it was found that recurrence rates were 7% for the non mesh technique vs. 1% for mesh repair. [4]

However, mesh-related complications have become increasingly important. Such complications include seromas, adhesions, chronic severe pain, migration and rejection of the mesh, and mesh-related infections. A meta-analysis evaluated 2418 mesh hernioplasties and found a combined mesh infection rate of 7.2% after AWR. [5] The same analysis also identified patient factors of advanced age, American Society of Anaesthesiologists score ≤3, and tobacco smoking as significant risk factors for the development of mesh infection. [5] Other factors like prior SSI, multiple procedures from the same incision at the time of repair, associated enterotomy or enterocutaneous fistula, longer operating time and learning curve [6] use of multifilament, braided and microporous meshes [7]

are risk factors for mesh infection. Even with the help of better quality meshes and prophylactic antibiotics, it remains a problem requiring further analysis.

Hernioplasty is one of the most common surgeries performed by general surgeons. With the advent of synthetic mesh recurrence rates and the burden on healthcare have drastically reduced. [8] Incidence of mesh infection is 2% - 4% for open inguinal hernia repair, 6% -10% for open incisional hernia repair [9] and 3.6% for incisional hernia repair. [10] Mesh infection can lead to potential re surgeries and morbidity to the patient and thus should be prevented. Factors influencing mesh infection are patient factors like COPD, high BMI, consumption of tobacco, advanced age, ASA>3, comorbidities. [11]

The aim of this study was to analysis of mesh related infections in Bihar region.

Materials and methods

A retrospective observational study was conducted in the department of General Surgery, Lord Buddha Kosi Medical College & Hospital, Saharsa, Bihar, India for 2 years and 100 patients were included in the study.

All cases that underwent ventral and groin hernia surgeries and reported with mesh infections in the Department of General Surgery were included in the study. Files with incomplete and inappropriate data needed for the study were excluded from the study. All primary hernia repairs were done on an elective basis, and antibiotics are given as per the protocol of our hospital. All cases of mesh infection during the study period (n=50) were analyzed. Demographics like age, sex and factors associated with mesh infection like BMI, comorbidities, time of presentation, tobacco consumption, ASA grade, type of hernia, type of hernia repair done were taken from medical records of the patients and their association with mesh infections were analyzed.

Results

Table 1: Patient characteristics

Gender	**N%**
Male	82 (82)
Female	18 (18)
Age in years	
<40	22 (22)
40-50	38 (38)
50-60	32 (32)
>60	8 (8)
BMI kg/m^2	
<18.5	0
18.5-25	0
25-30	12 (12)
>30	88 (88)

Mesh infection was more common in males. Among 100 patients, 82 were males and 18 female patients. Majority of the patients were in the age group 40-50 followed by 50-60 age groups.

Table 2: Time of presentation of mesh infection after primary repair, Co-morbidities in cases of mesh infection

Time in months	**N%**
1-5	70 (70)
6-10	30 (30)
Co-morbidities	
Present	40 (40)
Absent	60 (60)

The time of presentation after surgery was more after 5 months and 40% had co-morbidities.

Table 3: Details of co morbidities, antibiotics used in cases of mesh infection and mesh used

Co-morbidities	**N**
COPD	15
COPD+Type 2 DM	15
Type 2 DM	6
COPD +HTN	4
Antibiotics	
1st admission	

Cephalosporin	96
Amoxicillin clavulanic acid	4
2nd admission	
Cephalosporin	96
Piperacillin tazobactam	4
Mesh used	
Polypropylene mesh	85
Composite mesh	15

Antibiotic has used according to the protocol of our hospital; it was followed in 96 patients in the first surgery i.e., hernia repair surgery. Parenteral cephalosporin was used in 96 patients and amoxicillin- clavulanic acid in 4 patients. Antibiotic has repeated if the procedure was beyond 2 hours. After postoperative day 2, patients were switched over to oral antibiotics for three days. Likewise, during the second admission, i.e., when the patient was admitted with mesh infection, 96 patients were given cephalosporin, and 4 patients were given Piperacillin tazobactam. Polypropylene mesh was used in 85 patients, and the composite mesh was used in 15 patients who underwent IPOM.

Discussion

Huge incisional ventral hernia is defined as hernia defect size ≥10 cm [12], and its surgical correction is considered technically challenging and with a high chance of recurrence. Although repair with prosthesis was proven to reduce hernia recurrences, it associates a series of mesh-related complications like seroma, mesh erosion with sinus formation, chronic pain and discomfort, etc. Even in expert centers, postoperative wound related infective complications as high as 40–50%. [13-15]

Mesh infection was more common in males. Among 100 patients, 82 were males and 18 female patients. Majority of the patients were in the age group 40-50 followed by 50-60 age groups. The time of presentation after surgery was more after 5 months and 40% had co-morbidities. Mesh infection is a type of surgical site infection (SSI). Patient factors known to increase the risk of SSI and mesh infection are morbid obesity, tobacco abuse, chronic obstructive pulmonary disease (COPD), diabetes mellitus (DM), and immunosuppression. [16] The incidence of SSIs varies across surgical procedures, with a range of 0.1% to 50.4% reported in a systematic review by Korol et al. [17] Data showed that the inguinal hernia repair is associated with a lower incidence of mesh infection than an open procedure. [18] Nevertheless, thorough sterilization of instruments is more challenging, and the instruments are more prone to carry debris or organisms that can lead to infections. [19]

Antibiotic has used according to the protocol of our hospital; it was followed in 96 patients in the first surgery i.e., hernia repair surgery. Parenteral cephalosporin was used in 96 patients and amoxicillin- clavulanic acid in 4 patients. Antibiotic has repeated if the procedure was beyond 2 hours. After postoperative day 2, patients were switched over to oral antibiotics for three days. Likewise, during the second admission, i.e., when the patient was admitted with mesh infection, 96 patients were given cephalosporin, and 4 patients were given Piperacillin tazobactam. Polypropylene mesh was used in 85 patients, and the composite mesh was used in 15 patients who underwent IPOM. The cause of prolonged surgery could be that the procedure was performed by surgeons in the early phase of their learning curve. The risk for complications after hernia repair is increased among patients with comorbid conditions, such as obesity or diabetes. [20] Likewise, the body mass index of >30kg/m2 was associated with mesh infection. Proper selection of the patient, ensuring good control of comorbid medical conditions will prevent mesh infections. [21] Patient age, ASA score, smoking and were found to be associated with the development of mesh infection. Micro porous, multifilament mesh, and laminar mesh construction increase the surface area for bacterial adherence, impede leukocyte migration for bacterial clearance and leads to biofilm formation. [22]

Conclusion

Most of the patients took more than 5 months to report infection. Comorbidities were present in 30% patients and risk for complications after hernia repair is increased among patients with comorbid conditions. So, the proper selection of the patient, ensuring good control of comorbid medical conditions will prevent mesh infections.

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