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Incidence of Mesh Related Infection after Hernia Repair Surgery in a Tertiary Care Centre

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Abstract:*One of the most common abdominal wall surgeries performed by general surgeons is hernia repair surgery. With the advent of Mesh for hernia repair the recurrence rates of hernia has appreciably decreased. But mesh related complications have emerged. This is a prospective study done during May 2017 to May 2018 in a tertiary care hospital. The study included 1282 cases of hernia repair done with mesh and found 28 (2.18%) cases to have developed mesh related infections. In all the patients the mesh was removed and the infection resolved. There was no recurrence or persistent infection after removal of mesh.*

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I. Introduction:

One of the most common abdominal surgical procedures done by a general surgeon is hernia repair surgery. The usage of mesh for hernia repair has become a standard protocol throughout the world. This is mainly because the incidence of recurrence post hernia repair with mesh is considerably low when compared with conventional method. This was evidenced in many studies and clinical trials which compared conventional method of hernia repair and hernia repair with mesh [1-3].

The complications post hernia repair with mesh may be of infectious or non infectious like seroma, rejection of mesh, adhesion, migration of mesh, pain. Infection related to mesh may be multi factorial including the technique, preoperative prophylactic antibiotics, underlying co morbidities like diabetes, obesity, immunocompromised state.

The incidence of mesh related infection is highly variable which is evident as seen in many published series which may because of the different techniques, types of mesh, strategies to prevent infection like preoperative antibiotic coverage [4-6].

II. Method:

This is a prospective study conducted in tertiary care hospitals during May 2017 to May 2018. The patient's post operative period was closely monitored for any signs of mesh related infection, operative findings and microbiological report was obtained. Patient who underwent open hernia surgery using multifilament polypropylene mesh and onlay technique were included in the study group. Patients who had signs of superficial incisional infections were not included in the study. After assessing the infection the treatment plan included admission, systemic antibiotic therapy, drainage of the abscesses and finally removal of the infected mesh. The sinus tracts were also extirpated. After the procedure the samples were sent for microbiological examination from the operation theatre. Patients were then given appropriate antibiotics according to their culture and sensitivity reports and follow up was done in outpatient clinic to look for any recurrence of hernia following mesh removal.

III. Result:

Out of 1282 cases of hernia repair with mesh 28 (2.18%) patients had developed mesh related infection. Among these patients 23 were male patients and 5 were female patients with a median age of 53 years (range 35 to 76 years). During presentation to the clinic 14 patients had chronic sinus discharge and 3 patients had abscesses. None of the patients had any systemic manifestation. The period between hernia repair and mesh related infection varied from 4 months to 200 months.

Microbiological report of these patients showed growth of Methicillin sensitive Staphylococcus aureus in 8 patients, Methicillin resistant Staphylococcus aureus in 2 patients, Enterococci species in 4 patients, Escherichia coli in 3 patients and coagulase negative Staphylococcus growth in 2 patients. Cultures were negative among 9 patients.

The patients were followed up in outpatient department and none of the patient was found to have any recurrence of hernia during the follow up period.

Table 1 Prevalence of organism isolated from mesh related hernia patients

S.no	Organism	No: of organism isolated	Percentage
1	Methicillin sensitive Staphylococcus aureus	8	42%
2	Methicillin resistant Staphylococcus aureus	2	10.5%
3	Enterococci species	4	21%
4	Escherichia coli	3	15.8%
5	Coagulase negative Staphylococcus	2	10.5%

IV. Discussion:

Hernia repair with mesh have become the standard protocol throughout the world in recent era. Although there is more advantage in using mesh for hernia repair, the use of prosthetic devices always includes complications associated with it. The superficial surgical site infection occurs in the skin and subcutaneous tissue within 30 days post operatively. This superficial incisional infection has to be differentiated from the deep seated prosthetic infection associated with mesh. The superficial incisional infection is not mesh related and occurs in immediate postoperative period [7,8]. Whereas the deep prosthetic infection takes few months to cause infection and might also cause systemic infection [9].

When there is a mesh related infection the management of the infection involves both medical and surgical approach. Intravenous antibiotics and surgical removal of the mesh is done to clear the infection. Generally monotherapy with parenteral antibiotics is not preferred because the most common organism causing mesh related infection is Staphylococcus and it forms a biofilm which forms a barrier for the antimicrobial to enter and kill the bacteria [10,11] and also the fibroblastic response of the bacteria to the mesh results in formation of thick fibrous capsule surrounding the mesh and decreases the antimicrobial activity [12].

The most common bacteria associate with mesh related infection is Staphylococcus followed by gram negative bacteria. In our study also the commonest organism isolated was Staphylococcus species which correlates with the other studies and trials [13-15].

At times the culture may be negative due to fact that the patient is already on antimicrobial therapy. This study also showed culture negativity in 32% of samples [12]. In such situations the diagnosis should be made based on clinical presentation.

Combined medical approach with intravenous antibiotics and surgical removal of the infected mesh should be done to reduce the infection and complications associated with mesh infection. Recurrence of hernia do not occur post mesh removal if there is adequate formation of fibrous scarring prior to mesh removal. When a mesh is placed during hernia repair the initial response is acute inflammatory cell infiltration which is followed by fibroblast infiltration through the porous mesh that slowly replaces inflammatory cells [16,17,18]. The implanted material then becomes incorporated into the tissues surrounding it via fibrous infiltration and with formation of neo fascia. Recurrent hernia will not develop if there is adequate scarring and fibrous reaction prior to mesh removal.

The fibrous reaction evoked by the mesh material plays an important role in strength of the mesh repair rather than the mesh; hence there is usually no recurrence post mesh removal.

In conclusion the infection rates of mesh repair are considerably low when compared with the advantages of decreased recurrence rates. When patient presents with mesh infection it is mandatory to remove the infected mesh combined with antibiotic treatment to eradicate infection.

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