



## A Diagnostic Dilemma of a Discharging sinus over the Anterior Abdominal Wall

Authors

**Dr Ishant Rege<sup>1</sup>, Dr Virendra Athavale<sup>2</sup>, Dr Gaurav Batra<sup>3</sup>, Dr Iresh Shetty<sup>4</sup>,  
Dr Aditya Lad<sup>5</sup>, Dr Saurabh Thakkar<sup>6</sup>**

<sup>1</sup>Chief Resident, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [micks.ishant@gmail.com](mailto:micks.ishant@gmail.com), Mobile: 9881130004

<sup>2</sup>Professor, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [vsathavale@gmail.com](mailto:vsathavale@gmail.com), Mobile: 9370261265

<sup>3</sup>Chief Resident, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [dr.gauravbatra@gmail.com](mailto:dr.gauravbatra@gmail.com), Mobile: 9960999360

<sup>4</sup>Senior Resident, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [ireshshetty@gmail.com](mailto:ireshshetty@gmail.com), Mobile: 9741435746

<sup>5</sup>Senior Resident, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [adityapladd@gmail.com](mailto:adityapladd@gmail.com), Mobile: 7030742828

<sup>6</sup>Junior Resident, Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune 411018

Email: [saurabhtha@gmail.com](mailto:saurabhtha@gmail.com), Mobile: 9833722704

### Abstract

*Chronic mesh infection is one of the most challenging clinical conditions in the abdominal wall surgery. Whether an infected mesh must be totally removed or not, the role of antibiotics, the right timing for a repair and guidelines on how to treat the abdominal wall must be discussed. Incidences of mesh-related infection after herniars pair of up to 8% have been reported. The rate of infection is influenced considerably by underlying co-morbidity, and seems to be increased in patients with diabetes, immunosuppression or obesity. A clinician should strongly consider the possibility of a mesh-related infection in any patient who presents with fever of unknown aetiology, symptoms and / or signs of inflammation of the abdominal wall in the area of the mesh, or other less common clinical manifestations of mesh infection, such as an enterocutaneous fistula or abdominal abscess in the area of the mesh. Imaging techniques, including ultrasound and / or computerised tomography, can be useful for the diagnosis of mesh infection. When a mesh-related infection occurs, a combined medical and surgical approach involving intravenous antimicrobial agents and complete surgical removal of the mesh is the preferred management strategy.*

**Keywords:** *Hernia repair, infectious complications, mesh-related infection, abdominal wall sinus.*

## Introduction

Chronic mesh infection is one of the most challenging clinical conditions in the abdominal wall surgery. Whether an infected mesh must be totally removed or not, the role of antibiotics, the right timing for a repair and guidelines on how to treat the abdominal wall must be discussed.<sup>(1)</sup>

The main failures of mesh repair are hernia recurrences, mesh migration and mesh infection. The common presentations of mesh infection are draining sinuses, mesh extrusion and enteric fistulas caused by mesh erosion into hollow viscera<sup>(2)</sup>.

## Case Report

A 60 year old female, housewife presented with complaints of chronic discharging sinus from anterior abdominal wall since 4 months which was mainly serous to seropurulent in nature. There was history of fever which was intermittent in nature, with no evening rise in temperature. She gave history of hysterectomy done 20 years ago, laparoscopic cholecystectomy with abdominal wall hernia repair done 11 months ago. Following this patient developed an abscess over left lumbar region which was incised and drained two months later. No history of any medical illness.

On examination, she was well built and nourished. Per abdominal examination revealed an actively discharging sinus in the left lumbar region, 20 cm away from the midline. Discharge was seropurulent in nature. Surrounding skin showed blackish discoloration in the left lumbar region with redness around the opening of the sinus. Old healed healthy scar of hysterectomy and laparoscopic cholecystectomy seen. Multiple horizontal scar marks seen in the left lumbar region around the discharging sinus suggestive of previous incision and drainage done. The systemic examination was essentially normal.

All routine investigations were within normal limits with ESR of 15mm after one hour.

Ultrasonography abdomen and pelvis revealed a linear hypoechoic tract seen in the left lumbar region for approximate length of 5cm and average

thickness 6mm to 7mm. Tract seen extending upto parietal wall of peritoneum and is having two internal opening communicating with each other in circular shape extending to parietal peritoneum. CT abdomen and pelvis revealed a contrast opacified sinus tract in the left lumbar region, extending up to 7cms in the anterior abdomen into the parietal peritoneum with the tract extending upto the midline in the infraumbilical region with communication with transverse colon. There was no evidence of pelvic or para-aortic lymphadenopathy.

Sinogram was done which showed no evidence of intra-peritoneal connection on dye study.

The seropurulent discharge was sent for culture and sensitivity and *Pseudomonas aeruginosa* was isolated with no evidence of acid fast bacilli.

Decision was taken to perform exploration of the sinus tract for which previous operated site was opened along with a midline incision taken. E/o 15x15" floating mesh just superior to the pre-peritoneal layer was seen. Mesh was removed in to and sent separately for culture and sensitivity. Final histopathology report did not show evidence of Tuberculosis. Patient was treated with appropriate antibiotics and rest of the post operative period was uneventful. Patient was discharged on post operative day 15 with healthy suture scar.

Patient was followed up after one month. There was evidence of a healthy scar with no discharge from the suture line.



**Fig 01**



**Fig 02**



**Fig 3** Intra-operative images of infected mesh removal



**Fig 4** Infected Mesh removed after surgery

### Discussion

Mesh-related infections following surgery occur relatively infrequently compared with other device-related infections. Incidences of mesh-related infection after hernia repair of up to 8% have been reported<sup>(3)</sup>. The rate of infection is influenced considerably by underlying comorbidity, and seems to be increased in patients with diabetes, immunosuppression or obesity. Leber *et al*<sup>(4)</sup> conducted a retrospective cohort analysis of 200 patients who underwent open repair of abdominal incisional hernias with prosthetic material, with the aim of determining whether the incidence of long-term complications was influenced by the surgical technique. The authors concluded that the precise surgical approach did not influence the incidence of long-term complications significantly, including mesh infection. Although several authors have suggested that the laparoscopic approach to hernia repair has fewer post-operative complications compared to open repair, there are no clear, specific data regarding mesh-related infection rates<sup>(5)</sup>. The influence of mesh type on the incidence of infection was investigated in a recent study; the results showed that the use of multifilament polyester mesh resulted in a higher incidence of infection, small bowel obstruction and enterocutaneous fistula formation than the use of other types of mesh (knitted monofilament polypropylene, polytetrafluoroethylene or woven polypropylene)<sup>(4)</sup>. In addition, studies in experimental animals have shown that microporous mesh is associated with higher rates of infection and / or development of seromas, whereas macroporous mesh is associated with a higher incidence of adhesive and erosive events. Microporous mesh has a pore diameter of 10  $\mu$ m, with the result that bacteria can penetrate the mesh, but polymorphonuclearleukocytes (with a diameter of 75  $\mu$ m) cannot. This means that the bacteria in the mesh are protected from immunological defence mechanisms<sup>(6)</sup>.

The reported interval between hernia repair and the manifestation of a mesh infection ranges

from 2 weeks to 39 months <sup>(7)</sup>. Patients usually present with symptoms and signs of local acute inflammation (a combination of pain, erythema, tenderness, swelling and increased temperature in the abdominal wall in the area of the mesh). In addition, patients may have systemic manifestations such as fever, malaise, chills or rigors. A mesh-related infection can sometimes manifest with a discharging fistula, or with an intra abdominal abscess.

The most important point regarding the prevention of mesh-related infections is that foreign body reactions depend on the amount of the prosthesis (mesh) used. For this reason, surgeons should try to minimise the area of mesh that is introduced during the hernia operation, since the inserted foreign material is an ideal medium for bacterial colonisation <sup>(8)</sup>. In addition, four main approaches to the prevention of mesh infection have been used. First, the wound can be rinsed with an antibiotic containing solution, starting immediately after the dissection of the hernia sac, and then intermittently until the skin is sutured. It has been shown in an animal model that this approach inhibits the adhesion of bacteria to the surface of the mesh, as well as their growth <sup>(9)</sup>. Moreover, in a randomised trial of 162 patients who underwent inguinal hernia repair, there were no wound infections following the application of a single dose of cefamandole directly to the wound <sup>(10)</sup>.

A second approach involves the use of material placed in front of the mesh to slowly deliver an antimicrobial agent locally. In a randomised trial, the use of gentamicin-laced collagen tampons was tested in 301 patients undergoing prosthetic groin hernia repair. The collagen tampons were placed in front of the mesh before the aponeurosis of the external oblique muscle was sutured. This new technique resulted in fewer post-operative infections in comparison with 294 patients undergoing surgical repair for the same hernia without the use of gentamicin-containing collagen tampons <sup>(11)</sup>.

Third, a mesh containing embedded antimicrobial agents can be used. Such a mesh is thought to help prevent bacterial adhesion and colonisation when implanted in wounds, with a subsequent reduced likelihood of post-operative infections. Finally, traditional intravenous perioperative administration of antimicrobial agents can be used. Although hernia repair operations are classified as clean surgery, the administration of intravenous antibiotics perioperatively has been shown to be beneficial if a prosthetic material (mesh) is involved <sup>(12)</sup>.

A clinician should strongly consider the possibility of a mesh-related infection in any patient who presents with fever of unknown aetiology, symptoms and / or signs of inflammation of the abdominal wall in the area of the mesh, or other less common clinical manifestations of mesh infection, such as an enterocutaneous fistula or abdominal abscess in the area of the mesh. Imaging techniques, including ultrasound and / or computerised tomography, can be useful for the diagnosis of mesh infection. Such techniques usually reveal an area of inflammation in the subcutaneous fat around the mesh, which has different echogenic or density characteristics, respectively, from that in other conditions, such as seroma. Additionally, the results of the seimaging tests can indicate the presence of a fistula or an abscess. It is important that no attempt should be made to perform a diagnostic paracentesis of mesh related seromas when there are no symptoms and / or signs of inflammation of the abdominal wall. This is because of the real possibility of introduction of bacteria into the area of seroma during paracentesis, leading to the transformation of an aseptic reaction into an infectious process. When a mesh-related infection occurs, a combined medical and surgical approach involving intravenous antimicrobial agents and complete surgical removal of the mesh is the preferred management strategy <sup>(1)</sup>.

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