

A Ventral Hernia-repair-related *Mycobacterium mageritense* Mesh Infection Treated with NPWT without Mesh Removal

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Summary: Abdominal hernias are often repaired using prosthetic mesh, which is susceptible to infections. Normally, it is necessary to remove the mesh. However, successful mesh salvation with negative-pressure wound therapy (NPWT) has recently been reported. We encountered *Mycobacterium(M) mageritense* infection after hernia repair using the mesh. *M. mageritense* is classified as a fast-growing nontuberculous mycobacterium, but few cases have been reported. Nontuberculous mycobacterium can cause rare chronic infections. Skin and soft-tissue infections by nontuberculous mycobacterium involving localized abscess formation and chronic abscesses under various situations have been reported. We report an 85-year-old woman in whom a ventral hernia repair-related *M. mageritense* mesh infection was treated with NPWT without mesh removal. The hernia was repaired using Bard Ventralex mesh. Pus discharge was seen on the seventh postoperative day, and there was a small area of necrosis under the mesh. From the 13th postoperative day, NPWT was performed for 4 weeks. On the 29th postoperative day, a *M. mageritense* infection was diagnosed, which was resistant to multiple drugs. After the NPWT, most of the wound showed good granulation tissue formation. In conclusion, the mesh used to repair a hernia became infected with *M. mageritense*, but NPWT was able to salvage it. In cases of mesh infection involving small necrotic areas, performing NPWT under the guidance of an infectious disease expert may make it possible to preserve the mesh. (*Plast Reconstr Surg Glob Open* 2021;9:e3799; doi: [10.1097/GOX.0000000000003799](https://doi.org/10.1097/GOX.0000000000003799); Published online 7 September 2021.)

ndwelling devices, such as central venous catheters and prostheses, including mesh, are susceptible to infection. When infections occur, the prosthesis usually needs to be removed.^{1,2} On the other hand, recently, the successful salvage by negative-pressure wound therapy (NPWT) has been reported.³

We encountered rare *Mycobacterium(M) mageritense* mesh infection, after abdominal herniation repair. *M. mageritense*⁴⁻⁶ is classified into rapidly growing non-tuberculous mycobacteria (NTM). NTM are environmental mycobacteria.

However, they can also cause rare chronic skin and soft-tissue infections,⁷ which manifest as localized abscess and chronic ulceration. Skin and soft-tissue infections are commonly associated with the rapidly growing species *Mycobacterium fortuitum*, *M. abscessus*, and *M. chelonae*.⁷ *M. mageritense* is considered to be a variant of the *M. fortuitum* group.⁴⁻⁶ But there are only a few reports of skin and soft tissue infections by *M. mageritense*.^{4,5}

We report a case of *Mycobacterium mageritense* mesh infection, treated with NPWT without mesh removal in a ventral hernia.

CASE

The patient was an 85-year-old woman who had undergone a pedicled rectus abdominis flap for vulvar Paget disease. An abdominal hernia developed despite repair with Marlex mesh at the flap surgery. The first attempt to repair the hernia failed, resulting in loosening between the mesh and the fascia. Then the herniation became very large (width: 25 cm). Second surgery was performed after the patient complained of having difficulty defecating (Fig. 1A). A hernia orifice,

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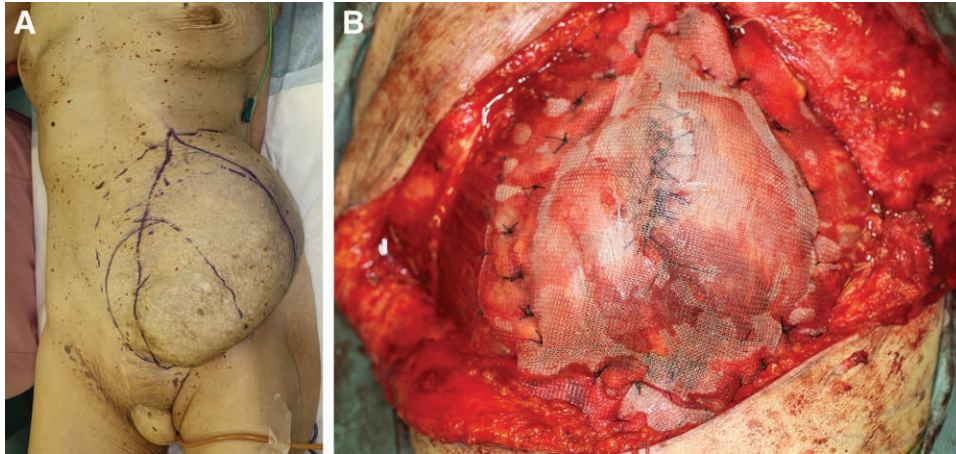


Fig. 1. Intraoperative images. A, A huge hernia with a width of 25 cm was observed. B, The hernia orifice (diameter: 15 cm) was closed using the left and right external oblique muscle aponeuroses and right anterior sheath of the rectus muscle. Bard Ventralex mesh was placed over the covered defect.

measuring about 15 cm in diameter, was found at the site from which the left rectus abdominis was harvested. The lateral margins of the left and right external oblique muscle aponeuroses were incised and folded back toward the midline (the right side included the anterior sheath of the rectus) to cover the peritoneal defect. Bard Ventralex mesh was placed over the covered defect (Fig. 1B). Ceftriaxone at a dose of 2 grams per day was administered intra and postoperatively. No fever occurred during the patient's postoperative course. Just after the operation, the patient developed subileus and required total parenteral nutrition. On the seventh postoperative day (POD), pus was discharged from the umbilical region, and the wound was opened, which exposed the mesh, half of which had not adhered to the upper skin. The pus was cultured. Necrosis was seen

under the mesh near the umbilicus (specifically near the aponeurosis sutures) (Fig. 2A). First, we decided to wash the wound with saline every day. The patient's white blood cell count was $184 \times 10^2/\mu\text{L}$, and her C-reactive protein level was 2.5 mg/dL. On the 13th POD, her white blood cell and C-reactive protein were $154 \times 10^2/\mu\text{L}$ and 1.0 mg/dL, respectively. NPWT was carried out for 4 weeks. On the 23rd POD, *M. abscessus* was reported as a causative mycobacterium. Intravenous amikacin, imipenem, and clarithromycin treatment was started, but the amikacin and clarithromycin were stopped on the 29th POD because the mycobacterium exhibited low sensitivity to these drugs, and levofloxacin was started. This time the mycobacterium species was determined to be *M. mageritense*. Details of this *M. mageritense* had already been reported by our infectious disease center.⁴

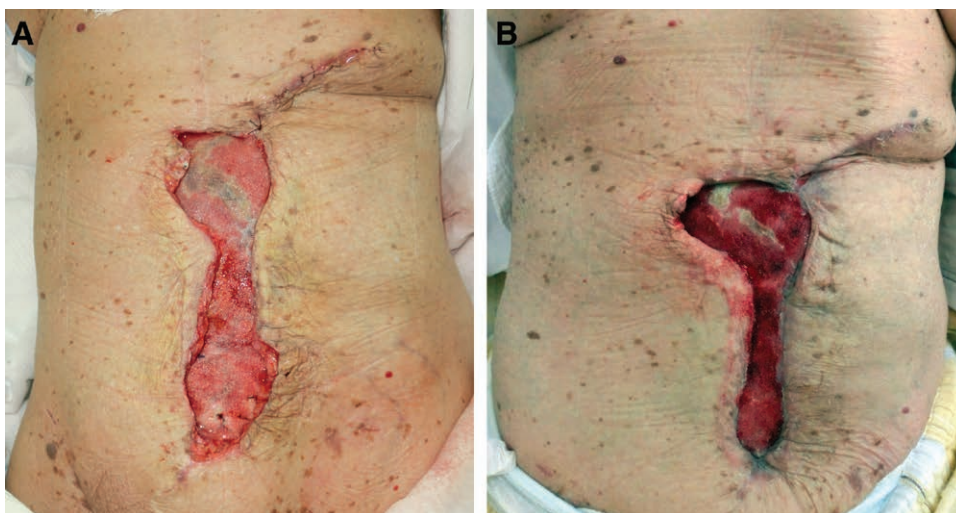


Fig. 2. Postoperative findings. A, Image obtained 2 weeks after the NPWT. A small area of necrosis was seen near the umbilicus. It was located under the mesh, and hence, necrotomy could not be performed. B, Image obtained 2½ months after surgery. After the NPWT, three quarters of the mesh was covered with skin, and most of the remaining quarter had been covered by granulation tissue. Furthermore, the necrotic area had diminished in size.

By the end of the NPWT, three quarters of the mesh was covered with skin, and most of the remaining quarter showed good granulation tissue formation over the mesh and *M. mageritense* was not detected in the culture. In addition, the size of the necrotic area around the umbilicus had also diminished (Fig. 2B).

From the 70th POD, our infectious disease center indicated that oral antibiotic treatment (levofloxacin + minocycline) should be continued until the complete wound closure or for 6 months.

Four months after the operation, no necrotic tissue was found, and the patient was transferred to another hospital. By this time, there were no ileus and no problems with defecation, or physical function. However, she developed geriatric depression and lacked appetite. For a while, the patient remained underweight, and poor granulation tissue formation and poor wound contraction were observed. However, wound closure was achieved 4 months later (Fig. 3).

DISCUSSION

Abdominal hernias are a common complication of abdominal surgery, occurring after 10%–25% procedures. Usually, synthetic mesh placement is used. However, the mesh becomes infected in 1%–2% of cases.³ Cases of mesh infection by NTM have also been reported.^{8–10} Normally, it is necessary to remove infected mesh.^{2,8–10}

In the current case, an infection was suspected because pus discharge was seen. A small necrotic area was found, but it was under the mesh and the surrounding area was already attached to the wound, making it difficult to remove the necrotic tissue under the mesh with risk of intestinal damage (Fig. 2A). Immediately after the wound was opened,

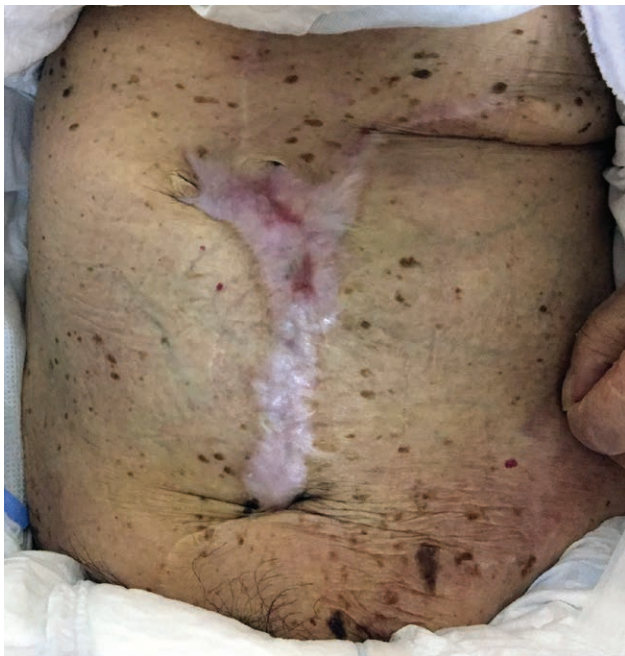


Fig. 3. Image obtained 1 year after surgery. Eventually, the wound contracted completely.

no worsening was observed. It was difficult to judge the patient's condition from blood test because of the presence of subileus, but her C-reactive protein level was not high, and also an immediate improvement was observed.

In addition to subileus, the hernia was so large that it would have been difficult to perform surgery to treat it after removing the mesh. However, if we had determined that the infection was out of control, we would have removed the mesh. We explained these points to the patient and her family, and decided to perform NPWT with their consent. Fortunately, good granulation tissue formed immediately over the mesh and the necrotic area diminished (Fig. 2B). Therefore, we decided to continue NPWT and not to remove mesh thereafter. But after total parenteral nutrition was withdrawn, poor granulation formed. We suspect that the wound might have healed faster if she had not developed geriatric depression.

Cultures are the gold-standard method for identifying NTM, but they usually require a long incubation period.⁶ Although the polymerase chain reaction assay is rapid and sensitive, it is not easy to distinguish between the closely related species.^{4,6} Drug therapy for NTM infections has not been established and the NTM was multidrug resistant, so cooperation with infectious disease specialists was necessary.

In conclusion, a *Mycobacterium mageritense* infection occurred in mesh that had been used for hernia repair, but NPWT was able to salvage the mesh. In cases of mesh infection involving small necrotic areas, it may be possible to preserve the mesh by performing NPWT under the guidance of an infectious disease expert.

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