Abdominal wall reconstruction with alloplastic mesh after Mycobacterium infection

Reconstrução de parede abdominal com tela aloplástica após infecção por micobactéria

ABSTRACT

The present report is a case study of a 51-year-old woman who underwent hysterectomy by videolaparoscopy, and eventually developed a mycobacterial infection. Treatment comprised antimicrobial administration, surgical debridement, and reconstruction of the abdominal wall with a synthetic mesh. During the postoperative period, the herniation of the abdominal wall required substitution of the mesh and subsequent abdominoplasty. This case report indicates the importance of preventing mycobacterium infection and provides treatment guidelines to optimize functional and aesthetic results.

Keywords: Mycobacterium. Abdominal wall/surgery. Surgical mesh.

INTRODUCTION

Abdominal wall reconstruction can be performed in several levels of complexity to correct a variety of defects from discreet tissue loss to important defects in the total tissue thickness, with visceral involvement. Among the common causes of abdominal injury, the most relevant include incisional hernia, neoplasia, infection, irradiation, and trauma.

Postoperative infections by atypical mycobacterium have been reported across the different medical specialties, including plastic surgery. Such infections are observed after procedures such as liposuction and augmentation mammoplasty, and most often after video laparoscopic abdominal surgery.

In addition to the local control of the infection, it is critical to restore the integrity of the abdominal wall to optimize the aesthetic results. This can be achieved with the aid of a synthetic mesh combined with abdominoplasty, which provides suitable coverage of the visceral organs in cases showing extensive musculofascial defects. The available mesh materials include polytetrafluoroethylene (PTFE, Gore-Tex), PTFE multifilament (Teflon), multifilament (Surgipro), poly-
propylene monofilament (Marlex), compound polypropylene monofilament (Proceed), double polypropylene filament (Prolene), and polyester multifilament (Mersilene).

The ideal synthetic mesh must possess the following characteristics: it must be chemically inert, it should remain unaffected by tissue fluids, it should not trigger foreign body responses, and it should not be carcinogenic or allergenic. In addition, it should be able to withstand mechanical stresses and be sterilized. The thread used for the fixation of the mesh must be inert, non-absorbable, and a monofilament.

**CASE REPORT**

A 51-year-old woman of mixed racial background, presenting with hypertension and without diabetes mellitus or a history of smoking, underwent hysterectomy by video laparoscopy on November 13, 2006. The patient developed transvaginal hemorrhage 16 days postoperatively, which required a new surgical approach and hospitalization in an Intensive Therapy Center for 3 days. Seven days after the second intervention, the patient exhibited serobloody secretion from the surgical wound, followed by wound dehiscence at the trocar sites with associated hyperthermia and arthralgia.

Computerized tomography of the entire abdomen showed the presence of heterogeneous supravesicular nodes, measuring approximately 1.3 × 1.3 cm, attached to the anterior abdominal wall.

On January 15, 2007, we removed a large granuloma of the abdominal wall that extended into the peritoneal cavity, requiring its reconstruction using Marlex mesh. A sample of the tissue removed was subjected to bacteriological analysis, and indicated infection by *Mycobacterium fortuitum*. As this was already suspected, and treatment with ethambutol, claritromycin, and terizidone had already been initiated, it was continued for 3 months, after which minocycline was added and the complete drug regimen was maintained for an additional 3 months. The patient developed herniation of the abdominal wall, which was corrected using a synthetic mesh on July 28, 2008.

Although the infectious process was effectively controlled, the herniation of the abdominal wall persisted, resulting in a deformity in the abdominal wall as well as discomfort during moderate physical effort. In August 2009, the second alloplastic mesh was exchanged for a Proceed mesh with conventional abdominoplasty (Figures 1 to 4).

The patient evolved asymptotically, without functional limitations, and was able to perform her routine activities. The patient was satisfied with the final aesthetic result.

**DISCUSSION**

Although mycobacterial infections can be diagnosed from samples of draining fluid, the analysis of tissue samples obtained from the infected area provides greater accuracy. A wound swab is simple, but it is not very useful. The initial identification of the bacteria may be achieved...
by staining for acid-alcohol resistant bacilli (BAAR) follow-
ing the method described by Ziehl-Neelsen. Cultures are
usually grown in thioglycolate, blood agar, chocolate agar,
or MacConkey and Lowenstein-Jensen media, which is
specific for the growth of mycobacterium. The growth of
microorganisms in these media may take several weeks, and
the culture must be kept under observation for up to 8 weeks.
The histopathological findings associated with mycoba-
terial lesions include chronic granulomatous inflammation
and necrotic granulomas, with epithelioid cells, histiocytes,
and giant cells2.

There are no specific standards for the treatment of my-
cobacterial infections. In general, disease control is based
on antibiograms. A serious infection may be treated initially
with a first or second generation cephalosporin combined
with aminoglycosides administered intravenously (for in-
stance, cephalothin and amikacin). The use of carbapenems
or quinolones is another treatment option. In cases of accep-
table evolution of the clinical picture after 2–4 weeks of
treatment, the medication is administered orally.

Most cases show infections of light or moderate intensity,
which are treated by oral administration of claritromycin
combined with 1 or 2 antimicrobial agents such as ciproflo-
xacin, sulfamethoxazole–trimethoprim, or tetracycline.

Although there are no established guidelines for the du-
ration of treatment, a minimum of 3 months of antimicrobial
therapy is recommended depending on the clinical manifes-
tations, clinical evolution, and immunological status of the
patient4,5.

Whenever indicated, draining, surgical debridement, or
removal of the prosthesis at the surgical site should be per-
formed, as it is a favorable environment for mycobacterial
survival. Alloplastic meshes with pores smaller than 10
microns must be removed when an infection is present be-
cause they do not allow for appropriate interpenetration
of the tissues. On the other hand, meshes with pores larger
than 75 microns such as the Proceed mesh, which is a mo-
nofilament that shows adequate tissue incorporation and is
associated with reduced risk of infection, do not need to be
removed6,7. In addition, the Proceed mesh can be applied
directly to the abdominal viscera because it contains an inner
layer of oxidized regenerated cellulose1.

CONCLUSIONS

The effective control of mycobacterial infections re-
quires a comprehensive preventive approach consisting of
rigorous sterilization of all surgical instruments and mate-
rials including optical fiber, methylene blue, and silicone
implants7,8.

The early diagnosis of mycobacterial infections and an
effective treatment regimen, including antibiotic therapy and
surgical debridement, are critical to ensure the positive evo-
lation of the patient. Moreover, several synthetic materials
and surgical repair techniques in plastic and reconstructive
surgery are currently available for the proper reconstruction
of the abdominal wall.

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