



Incidence and Treatment of Parietal Prosthesis Infections: A Retrospective Study of 793 Hernia and Eventration Cures

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Abstract

The cures of hernias and eventrations by prosthesis expose to the risk of infection of the prosthetic material. We carried out a retrospective study about 793 cures of hernia and eventration that were operated on in our service and treated by the establishment of the prosthesis between 2015 and 2020 with the aim of specifying the risk factors for prosthesis infections and the therapeutic modalities. The results were as follows: 9 cases of prosthesis infection (1.15%) are noted with 6 cases (66.7%) after inguinal hernia surgery and 3 cases (33.3%) after hernia surgery. The time to onset of the infection was early in 5 cases, medium in 3 cases and late in one case. A radical treatment was carried out in 4 patients and conservative in 5 cases. The incidence of prosthesis infection is variable between 0.2% and 8%; it is around 1.15% in our series, which is consistent with the results of the literature. This formidable complication requires the rigorous application of aseptic measures as well as a good indication of the use of parietal prostheses.

Subject Areas

Surgery & Surgical Specialties

Keywords

Infection, Prosthesis, Hernia

1. Introduction

Infection of the prosthetic material is one of the main complications of hernia and eventration repairs with prosthesis fitting. Its incidence varies according to

the series from 0.2% to 8%. It can occur immediately after surgery or later, several months or even several years later. The treatment can be conservative or radical with the removal of the infected material [1].

The objective of this work is to compare our results in the management of infections of parietal prostheses with those in the literature.

2. Patients and Methods

This is a retrospective analysis of a series of patients operated on between June 2015 and July 2020 for inguinal hernia and eventration and having benefited from a prosthetic cure. For all the patients, the following data were collected: age, sex, pathological history, indication of treatment, type of prosthesis, operative technique, complications and their therapeutic modalities as well as the evolution.

3. Results

During this period we carried out 810 hernia and eventration cures, including 793 plate fittings, or 97.9% of prosthetic cure.

We noted 9 cases of infection of the prosthetic material with a rate of 1.15%. 6 cases were after inguinal hernia repair (*i.e.* 66.7%) and 3 cases were after hernia surgery (*i.e.* 33.3%). The average age of the patients who presented with an infection of the prostheses was 55 years with a male predominance, *i.e.* a sex ratio of 8. 55.5% of these patients were diabetic (n = 5). 8 cases were treated with non-resorbable prolene-type plates: 6 inguinal hernia repairs using the Lichtenstein technique and 2 hernia repairs by the placement of a preaponeurotic plate and a single case treated with a two-sided intraperitoneal plate.

The time to onset of the infection was early (less than one month) in 05 cases, between one month and one year in 3 cases and late (more than one year) in only one case. We noted 6 cases of infection with an acute mode of onset (serous or purulent oozing) and 3 cases with a chronic mode of onset (granuloma 2 cases and purulent fistula 1 case).

Radical treatment with removal of the prosthesis was performed in 4 patients (**Figures 1-3**) and conservative treatment was performed in 5 patients. The evolution was favorable with disappearance of the signs of infection. There was no recurrence with a follow-up of 4 years.

4. Discussion

Infection is a risk with any surgery regardless of the surgical technique. Pathogenic germs exist in more than 90% of surgical wounds during closure [2]. Parietal surgery cannot escape this major risk dreaded during the insertion of a prosthesis. This risk varies according to the series, the implantation site and the type of prosthesis used [3]. Indeed, the infection of the material is one of the main complications of cures of disbowelment with installation of a prosthesis. Its incidence varies between 0.2% and 8% [1]. It is around 1.15% in our series,



Figure 1. Bifacial plaque infected and fistulized to the skin.



Figure 2. Raphy repair of the abdominal wall after removal of the intraperitoneal plaque.

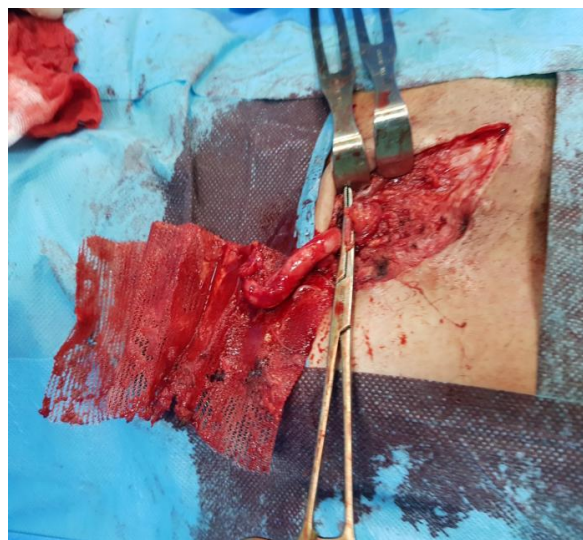


Figure 3. Removal of a prolene plaque infected with fistulized appendicitis in the inguinal region.

which agrees with the results of the literature. Despite its rarity, it remains a serious event because of the consequences it can cause and its therapeutic difficulties. It can occur in the immediate postoperative period, revealing itself in the acute phase by an abscess (fever, redness, flow, biological inflammatory syndrome) or later, several months or even several years later, evolving quietly with few general signs and signs discrete areas: purulent discharge at the level of a fistulous orifice next to the prosthesis [1].

The contamination of the prosthesis seems to occur at the time of the intervention as evidenced by the cutaneous origin of the germs most often found during bacteriological samples. In fact, 81% of prosthesis infections are linked to *Staphylococcus aureus*, 52% of which are methicillin-resistant [4]. In our study, Staphylococcus is found in 87.5% of cases. The typing of the germ orients on the mechanism of contamination: wild germ carried by the patient himself or multi-resistant germ rather contracted in the care structure [5].

Among the factors favoring the infection of the prosthetic material, we find factors related to the patient, mainly diabetes, and factors related to the intervention: recurrence or strangulation of the hernia, associated surgical procedure, site of implantation of the prosthesis and prolonged operating time [4]. There are also factors related to the prostheses: at best, the prostheses must meet a certain number of criteria [6]:

- Not be physically modified by host tissues;
- Be chemically inert;
- Do not cause too much inflammatory reaction to giant cells;
- Not be carcinogenic;
- Do not cause allergy or hypersensitivity;
- Be able to be manufactured in the desired shape at a reasonable cost;
- Can be easily sterilized.

At the microscopic scale, prosthetic textiles are characterized by the size of the pores they present. Amid [7] classified them into four groups:

Type I: corresponds to macroporous prostheses, they contain pores wider than 75 microns thus allowing the passage of macrophages, fibroblasts, new vessels and collagen fibers. This group includes the various polypropylene-based monofilament prostheses (Prolène*, biomesh*, etc.)

Type II: corresponds to microporous prostheses with pores smaller than 10 microns. They are mainly made from ePTFE (Goretex*).

Type III: corresponds to macroporous prostheses made of multi-filament Mersilene type*.

Type IV: corresponds to waterproof prostheses made of silastic or other.

Infection of a prosthesis usually results from intraoperative contamination. It mainly concerns non-absorbable prostheses [8]. The body's means of defense calls upon the macrophages coming to phagocytose the pathogenic agent. Bacteria measuring on average one micron can easily colonize the prosthesis, but macrophages whose size is around 70 microns require a macroporous material to come into contact with the pathogenic agent. This explains the good resistance

to infection of type I and III prostheses. Thus, even contaminated, a macroporous prosthesis can be left in place after debridement, irrigation washing and antibiotic therapy; while a microporous prosthesis must imperatively be removed [3].

Early infections must be taken seriously and treated aggressively to prevent contamination of the prosthesis: extensive debridement, debridement and irrigation of the wall, appropriate antibiotic therapy and local care [9]. In the case of chronic sepsis, after failure of conservative treatments, the therapeutic objective is the maximum excision of tissues and infected material, guided by the instillation of blue through the fistulous orifice, with repair of the secondary parietal decay by simple raphy and controlled healing of the superficial planes. Once definitive healing has been achieved, any recurrence could be treated remotely with a non-absorbable prosthesis [1].

The prevention of these infections justifies rigorous asepsis during the installation of parietal prostheses: never a prosthesis during the cure of a strangulated eventration taking into account the septic risk linked to bacterial translocation, systematic antibiotic prophylaxis, deep insertion site preferred, preventive drainage of collections... [3].

5. Conclusion

The use of parietal prostheses has improved the treatment of eventrations and inguinal hernias, especially when the wall is of poor quality. The problem of infection of the prosthetic material remains a formidable complication. There are factors that favor infection linked to the patient and the intervention, requiring compliance with aseptic measures and the correct indication of the use of parietal prostheses.

Conflicts of Interest

The authors declare no conflict of interest.

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