Abstract

Background: In cases of a contaminated surgical field, the usual technique of abdominal closure with a synthetic mesh is not common due to a high complication rate. Recently, there is an ongoing use with biological meshes. Those meshes enable abdominal wall reconstruction even in contaminated surgical fields. We present a series of eighteen patients who underwent surgery using a biological mesh.

Methods: We reviewed the medical charts of all the patients that underwent abdominal wall reconstruction or hernia repair with a biological mesh from March 2009 until April 2014.

Results: Eighteen patients underwent surgery with the use of a biological mesh. The age range was 8-105, with an average of 57.9 ± 20.8.

In four cases, the surgery was elective; all the rest had a contaminated surgical field that prevented the usual use of a synthetic mesh. Three patients developed a fistula and two had minor wound complications that were treated conservatively with antibiotics.

Discussion: The literature shows conflicting conclusions concerning the use of biological meshes. On the one hand, some studies report an advantage of those meshes, including Permacol™ mesh, in cases of contaminated surgical field with a reduction of hernia recurrence rate. On the other hand, recent reports failed to demonstrate this advantage. According to our experience with a series of eighteen patients, repairing an abdominal wall hernia with a biological mesh is safe, feasible and can be used in cases of a contaminated surgical field.

INTRODUCTION

Background

Reconstruction of the abdominal wall due to a huge ventral hernia is a challenging task for the surgeon. Usually the repair is done using a synthetic mesh that reduces the recurrence rate [1]. Nevertheless, those meshes can lead to many complications such as adhesions, skin erosion, fistula and SSI [2]. Consequently, the use of synthetic mesh in a contaminated surgical field is considered with a high morbidity and is uncommon [3].

Due to this problem, recently there is an ongoing trend of using biological meshes that are similar to the human dermis, thus the incidence of SSI is lower. The Permacol™ mesh is an example of a biological mesh; it is made out of porcine collagen that has elastin content [4]. Recent studies show that the mesh is safe and can be an alternative to the synthetic meshes in cases of a contaminated surgical field [5,6].

We present our experience with the use of a biological mesh in a series of eighteen patients with an age range of 8-105.

METHODS

We retrospectively reviewed the medical charts of all the patients that underwent abdominal wall reconstruction or a repair of a ventral hernia with a biological mesh from March 2009 till April 2014. We evaluated the parameters of age, gender, number of previous operations, contamination of the surgical field, the length of mesh that was implanted and post-operative complications.

Surgical technique

In all the operations except one, the surgical technique was sub lay with an overlapping of at least 5 cm. The mesh was sutured in an interrupted suture using prolene stitches with a primary closure of the skin above. In most cases, a drainage (JP10) was inserted over the mesh for a few days till the serotic drainage was less than 50 CC per day.

RESULTS

Eighteen patients underwent abdominal wall reconstruction with a Permacol™ mesh from March 2009 till April 2014. From which, nine were men and nine were women with an average age of 57.920.8± and a median of 54.5. The youngest patient was 8 years old (a he was brought to our center from a refugee camp with necrosis of the abdominal wall) and the oldest was a 105 that developed post-operative evertation.

In four cases, the operation was elective, three patients were operated due to parastomal hernia and one underwent a repair of...
a recto-vesical fistula. All the other patients had a contaminated surgical field that forbid the use of a synthetic mesh. The mean number of prior surgeries was 4.6 consequently, the mean length of hospitalization was 17 days (the patients had much co-morbiditity and underwent an urgent operation).

Concerning post-operative complications, three patients developed a fistula, from which two needed a re-operation (one underwent an excision of a stitch fistula and the other had skin graft repair). Moreover, two patients developed minor SSI and were treated conservatively with antibiotics. From all the patients, three had a re-operation, two were mentioned above and the third needed also a skin graft.

Four patients died in the perioperative period, three patients had severe comorbidity, they underwent colon resection with anastomotic leakage rather than the usage of the mesh. The anastomosis and we believe that the cause is related to anastomotic leakage rather than the usage of the mesh. The fourth patient died 24 hours after the surgery due to fascitis.

**DISCUSSION**

The Permacol™ mesh is a biological mesh from a porcine dermis, that is based on collagen type I. During the manufacturing process, the cellular components are removed, and the collagen of the dermis is treated with hexamethylene diisocyanate (HMDI) to increase the degree of cross-linking [7]. This technique also promotes neo-vascularization and tissue in growth, thereby creating an environment that favors antibiotic permeation [8,9].

The use of a biological mesh of hernia repair was first proposed in 1984 [10]. Since then there are few reports about the mesh [11-14], probably due to the high price of the mesh.

Although there are many advantages to a biological mesh the utility is still controversial, a large study that compared in vivo and in vitro results of biological meshes to poly tetra fluoro ethylene mesh, Perclude® (ePTFE) in a contaminated surgical field failed to show a advantage of the biological meshes.

In our study, we used a biological mesh in a variety of patients, from the age of 8 till 105. Most patients had severe co-morbidities and suffered from a contaminated surgical field, thus the use of a synthetic mesh was not acceptable. Even though several patients had postoperative complications, we believe that the biological mesh was the best treatment for them and that the complications were not related to the mesh, but to their general condition.

According to our experience, a biological mesh is feasible and safe and can be the treatment for abdominal hernia repair in a contaminated surgical field.

**REFERENCES**