

The bovine pericardial patch in breast reconstruction: a case report

G. SEMPRINI¹, F. CATTIN², F. DE BIASIO¹, C. CEDOLINI², P.C. PARODI¹

SUMMARY: The bovine pericardial patch in breast reconstruction: a case report.

G. SEMPRINI, F. CATTIN, F. DE BIASIO, C. CEDOLINI, P.C. PARODI

In the last years there has been a growing demand of plastic surgery for soft tissue reconstruction. In response to this, many biological and synthetic devices have been produced, aiming to allow wide and complex body reshaping. Acellular dermal matrices are one of these devices, and are made of human or animal tissues made acellular after their sampling. They are used for cervical, breast and abdominal wall reconstruction. Tutopatch[®], generally used for face reconstruction or neurosurgery, is made of acellular bovine pericardium, and its high amount of collagen allows a fast tissue healing and a scaffold for the surrounding tissue regeneration. In our case report Tutopatch[®] has been used in immediate breast reconstruction after mastectomy. This device has been used to close laterally the subpectoral pocket, allowing a bigger volume prosthesis to be placed. We have not experienced particular postoperative complications, and after 12 months of follow up we have found a valid functional and aesthetic result. We consider Tutopatch[®] as a valid alternative to other acellular dermal matrices specifically designed for breast reconstruction.

RIASSUNTO: Utilizzo di matrice dermica di pericardio bovino nella ricostruzione mammaria: case report.

G. SEMPRINI, F. CATTIN, F. DE BIASIO, C. CEDOLINI, P.C. PARODI

Il numero di interventi di chirurgia plastica eseguiti per ricostruzione dei tessuti molli è notevolmente aumentato negli ultimi anni. Per questo motivo, sono stati creati numerosi presidi biologici e sintetici utili a permettere l'esecuzione di numerosi tipi di intervento. Le matrici dermiche acellulari fanno parte di questi presidi, sono composte da tessuto decellularizzato di origine umana o animale e consentono interventi ricostruttivi del distretto cervicale, mammario o della parete addominale. Il Tutopatch[®], normalmente utilizzato per la ricostruzione del volto o in neurochirurgia, è costituito da pericardio bovino decellularizzato, e la sua ricchezza in collagene consente una rapida riparazione dei difetti tissutali e un sostegno per la rigenerazione dei tessuti circostanti. Presentiamo un caso di utilizzo di Tutopatch[®] nella chirurgia ricostruttiva immediata della mammella dopo mastectomia. Il presidio è stato utilizzato per la chiusura laterale della tasca protesica, consentendo il posizionamento immediato di una protesi definitiva di grande volume. Non sono state registrate particolari complicanze postoperatorie e dopo 12 mesi, al follow up, il risultato funzionale ed estetico era ottimale. Pertanto, riteniamo che il Tutopatch[®] possa essere una valida alternativa all'utilizzo di altre matrici dermiche più specificatamente progettate per la ricostruzione mammaria.

KEY WORDS: Breast reconstruction - Acellular dermal matrix.
Ricostruzione mammaria - Matrice dermica.

Introduction

As survival rates of cancer, trauma, and other destructive processes have increased, today's plastic surgery faces a growing demand for soft tissue reconstruction.

Multiple alloplastic and synthetic materials have been developed, providing valuable treatment options for many types of reconstructions (1). These allogenic products are made of either human or porcine or bovine dermis that is rendered acellular by franchised and undisclosed methods (2). Specifically, acellular dermal matrix has revolutionized the approach to difficult clinical scenarios, including head and neck, breast, abdominal wall and extremities.

Since 2006, an increasing number of studies have highlighted the use of acellular dermal matrix in primary breast reconstruction. Acellular dermal matrix (ADM) is made by taking a full thickness section of skin from

University of Udine, Udine, Italy
¹ Plastic and Reconstructive Surgery Department
² General Surgery Department

© Copyright 2012, CIC Edizioni Internazionali, Roma

donor source, which in most cases is human cadaver, porcine, or bovine. There are many names and types of acellular dermal matrix products, all purposing to be the best formula but all based upon the same principle (3). Tutopatch® is a collagenous membrane derived from solvent preserved irradiated bovine pericardium; it provides a reliable closure of tissue defect and serves as scaffold for patient's own tissue. Tutopatch® is used to replace or strengthen connective tissue structure and as a barrier membrane, for example in neurosurgery (4). In plastic surgery Tutopatch® is suitable to fill subcutaneous defects or as a subdermal implant for facial wrinkles correction.

Case report

In this case report we show a different use of Tutopatch® in breast reconstruction. We report the case of a 60 years old woman undergone right nipple sparing mastectomy for breast cancer (Fig. 1). She was a non smoker patient, BMI 25, without cardiovascular or metabolic comorbidities. The reconstructive choice was an immediate breast reconstruction using a prosthesis.

Preoperatively, inframammary fold, lateral mammary fold and planned skin excision were marked. After the mastectomy skin flaps were assessed for viability. As reconstruction began, acellular dermal graft were reconstituted and rehydrated in normal saline as recommended by manufacturer. The pectoralis major muscle was elevated from the underlying chest wall using electrocautery, with care taken to preserve the pectoralis minor, serratus anterior and rectus abdominis muscles. A small portion of the most inferomedial attachment of the pectoralis major was released as necessary to create the desired pocket shape. Care was taken to preserve the sternal attachments of the pectoralis as prevention against excessive medial migration of the implant or superior displacement of the muscle. The preoperative markings of the inframammary fold and lateral mammary fold on the skin was transposed onto the chest wall using methylene blu dye. The reconstituted graft then was placed in the chest wall. The corners of the graft were anchored to the chest wall at the medial and lateral ends of the proposed inframammary fold and lateral mammary fold, respectively, using 2-0 nylon sutures. When interrupted sutures were used, the central segment of the graft was secured to the proposed inframammary fold with additional sutures at 1 to 2 cm intervals, leaving the most central sutures untied and clamped with hemostats for later tension adjustments. Alternatively, a running suture technique can be used, whereby the sutures are not pulled snug until final placement of the expander is completed. A prosthesis was placed under the pectoralis muscle and the acellular dermal graft. The device was seated in the pocket, making sure that the expander's most inferior edge was all the way down to the new inframammary fold. The inferior border of the pectoralis muscle was aligned precisely with the superior border of the graft with a few staples, and then secured with a running 2/0 Vycril sutures closing the pocket over the prosthesis (Figs 2-3). We also placed two suction drains (subcutaneous and peri-prosthetic), and then the skin was closed. After surgery, the patient underwent antibiotic prophylaxis. Drains were removed after seven days. The postoperative period was uneventful, above all without any hematomas, serum collections or infections. The patient recovered optimally, and 12 months after surgery there were no signs of capsular contracture, and only just a mammary asymmetry due to the patient's refusal of any contralateral breast reshaping (Fig. 4).



Fig. 1 - Preoperative.



Fig. 2 - Intraoperative.



Fig. 3 - Intraoperative.



Fig. 4 - Postoperative.

Discussion

The ideal soft tissue substitute must be durable, nonantigenic, noninfectious and well tolerated by the host.

References

1. Wainwright D, Madden M, Luterman A, et al. Clinical evaluation of an acellular allograft dermal matrix in full thickness burns. *J Burn Care Rehabil* 1996;17:124-136.
2. Patrick D. Cole, Drew Stal, Safa E. Sharabi, et al. A comparative, long-term assessment of four soft tissue substitutes. *Aesthet Surg J* 2011;31(6):674-681.
3. Joshua Fosnot, Stephen J. Kovach, et al. Acellular Dermal Matrix: General Principles for Plastic Surgeon. *Aesthet Surg J* 2011;31(7S):5S-12S.
4. Gerard JM, Gersdorff M. The Tutopatch graft for transcanalmyringoplasty. *B-Ent* 2006;2(4): 177-9.

In addition, many specific applications require additional characteristics, such as soft consistency for breast reconstruction, the ability to withstand multiple vectors of tension for abdominal wall hernia repair and firm consistency for dorsal nasal reconstruction. Despite the relative success of ADM for soft tissue reconstruction, it is still important to further demarcate which substitutes are best suited for which type of reconstruction, to minimize complications and the need for surgical revision.

In our case the use of bovine pericardium wrap had good aesthetic results without complications.

Conclusion

The use of bovine pericardial patch is a safe alternative to other dermal matrix in breast reconstructive surgery, even if its indications are different. Importantly, as in our case, bovine pericardium wrap compared favorably with other ones.

Competing interests

The authors declare no conflict of interests.