Epidural Bovine Pericardium Facilitates Dissection During Cranioplasty: A Technical Note

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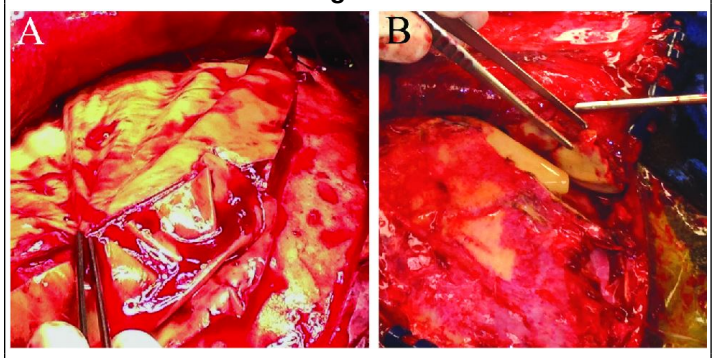
Introduction

Adhesions and scarring of the subcutaneous tissue to the dura mater or dural substitute often complicate cranioplasty. We present our experience with epidural bovine pericardium as a barrier membrane to minimize adhesions and facilitate separation of tissue layers.

Figure 1



Intraoperative photographs illustrating the controlled dissection plane above the bovine pericardium (Panel A) and preservation of the temporalis muscle (Panel B) at the time of cranioplasty in 2 representative patients.

Methods

A cohort of patients that underwent decompressive craniectomy and subsequent cranioplasty at a major academic institution in the United States from August 2007 to October 2013 and had epidural bovine pericardium placed as a barrier membrane was retrospectively reviewed. Medical records and imaging studies were reviewed for a number of variables including presence of adhesions, infection, contusions, and operative complications.

Results

Twenty-nine patients (male : female = 1 : 1.1; mean age 45 ± 14.7 years) that underwent decompressive craniectomy with placement of epidural bovine pericardium with subsequent cranioplasty were identified. The interval between craniectomy and cranioplasty was 111.2 ± 227.2 days and autologous bone was used for cranioplasty in 86.2% of cases. The average size of cranial defect was 71.2 ± 28.5 cm2. At the time of cranioplasty, no or minimal adhesions were found between the subcutaneous tissue and the epidural bovine pericardium. There were 2 (6.9%) infections, 2 (6.9%) patients had contusion after the cranioplasty, and no patient had a complication after cranioplasty that required re-operation.

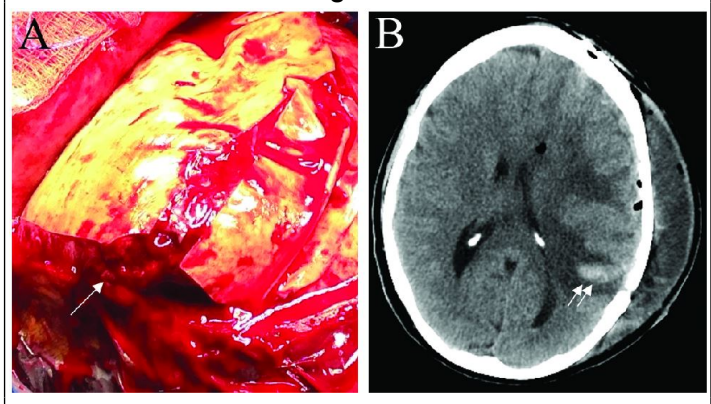
Conclusions

Epidural bovine pericardium at the time of decompressive craniectomy facilitates dissection at the time of cranioplasty and is not associated with any additional risks.

Learning Objectives

Consider bovine pericardium as a barrier membrane placed at the time of craniectomy to facilitate dissection during cranioplasty.

Figure 2



In one patient who had undergone a left decompressive craniectomy for a large venous infarct after sinus thrombosis, the bovine pericardium did not adequately overlap the edges of the craniotomy and the brain was damaged (white arrow) during cranioplasty (Panel A). Axial CT head showed a contusion of the posterior temporal region (white double arrow) (Panel B). The patient developed speech difficulties postoperatively that resolved after 2 months.