Off-the-shelf dural substitutes have been developed as alternatives to autologous transplantation and various xenografts have been studied, including bovine and ovine pericardium, porcine small intestinal submucosa, and processed collagen matrices. However, these xenografts are often associated with adverse effects, such as graft dissolution, encapsulation, foreign body reaction, scarring, and adhesion formation. Permanent and bioresorbable synthetic polymer membranes have also been tested as dural substitutes.

The small intestinal submucosa (SIS) is a promising material used in a variety of applications. Based on the limitations of previous studies, we conducted an animal study to evaluate the efficacy and safety of the SIS in preclinical trials. Twenty-four male beagle dogs were subjected to surgical resection to produce dural defects. SIS or autologous dural mater was patched on the dural defect. Gross and histological evaluations were carried out to evaluate the efficacy and safety of the therapy. Our findings demonstrated that the SIS, which stimulated connective and epithelial tissue responses for dural regeneration and functional recovery without immunological rejection, could provide prolonged defect repair and prevent complications. The mechanical properties of the SIS could be adjusted by application of multiple layers, and the biocompatibility of the material was appropriate. Thus, our data suggested that this material may represent an alternative option for clinical treatment of dural defects [1)].

1)
He SK, Guo JH, Wang ZL, Zhang Y, Tu YH, Wu SZ, Huang FG, Xie HQ. Efficacy and safety of small intestinal submucosa in dural defect repair in a canine model. Mater Sci Eng C Mater Biol Appl. 2017 Apr 1;73:267-274. doi: 10.1016/j.msec.2016.12.077. Epub 2016 Dec 20. PubMed PMID: 28183608.