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Adhesive Methods for Scaffold-aided Repair of Spina Bifida

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ABSTRACT

Spina bifida aperta is a serious birth defect involving the protrusion of the spinal cord outside the spine that can lead to partial paralysis, inability to control the urinary tract, and often death, before or after birth. On average, medical treatment related to spina bifida costs the United States \$1,176,000,000 each year. Advancements in existing treatment options, namely fetal surgery, can greatly decrease neurological injury and related costs, but can also lead to birth complications and have lasting effects on both the mother and child. The application of tissue scaffolds to aid closure of the gap left after fetal correction have been in development, but advancements in adhesive methods for the scaffolds are needed to decrease surgery time and increase deformity coverage. This study compares strengths of different adhesive methods in a simulated amniotic fluid environment through peel tests and determines the viability *in vitro* of a lab-produced collagen patch as a scaffold to cover the spina bifida defect.

KEYWORDS

Spina Bifida, Myelomeningocele, Fetal Surgery, Meningomyelocele, Spina Bifida Aperta, Open Spina Bifida, Tissue Engineering, Tissue Scaffold, Tissue Adhesive, Tissue Adhesive Testing