

Reduction in postlaminectomy epidural adhesions in sheep using a fibrin sealant-based medicated adhesion barrier.

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Abstract:

Epidural adhesion formation is believed to be a central governing factor in the prevalence of pain after spinal surgery and is regarded as being the primary instigator of neural tethering, leading to complications during revision surgery. In this study, we assess the effectiveness and safety of fibrin sealant supplemented with tributyrin, termed Medicated Adhesion Barrier (MAB), as an alternative means of reducing the incidence of posterior spinal epidural adhesion formation. Laminectomy defects in sheep were treated with MAB, fibrin sealant alone, ADCONGel, or remained untreated. At 12 weeks postoperatively, the extent of fibrosis and epidural adhesion formation was evaluated using magnetic resonance imaging (MRI), peel-off testing, and histological examination. Initial invitro analysis revealed that tributyrin was retained in fibrin gel in a time-dependent manner and was an effective inhibitor of fibroblast proliferation. Treatment of sheep with MAB significantly reduced both the prevalence ($p < 0.05$) and tenacity ($p < 0.05$) of epidural adhesions. The effectiveness of MAB in preventing epidural adhesions was found to be comparable with that of ADCONGel. No adverse events were reported after the use of MAB. The MAB preparation seems to be an effective resorbable barrier for the prevention of epidural adhesions.