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Successful repair of thoracic wall defect using an ovine rumen BioGraft in a dog

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Thoracic wall reconstruction requires careful management of the pleural space, skeletal support, and soft-tissue coverage. Biografts have demonstrated potential in promoting tissue regeneration and facilitating wound repair (Dhoolappa *et al.*, 2022). This report documents the successful repair of a 4 cm × 4 cm left thoracic wall defect in an 8-yr-old dog using an ovine rumen BioGraft.

Fig.1: (A) Macroscopic view of laboratory-prepared BioGraft

An 8-yr-old female mongrel dog was presented with a 4 cm × 4 cm full-thickness puncture wound on the left thoracic wall at the 9th intercostal space, exhibiting tachypnea and tachycardia secondary to infection. Surgical reconstruction was performed using an ovine rumen BioGraft (6 cm × 6 cm), indigenously developed at the Department of Anatomy, Veterinary College, KVAFSU, Shimoga, prepared from decellularized ovine rumen (Dhoolappa *et al*., 2022). The safety and efficacy of the BioGraft had been previously validated using zebrafish embryo and small ruminant models (Umesh *et al*., 2024).

The BioGraft is currently under development and undergoing clinical validation (Fig. 1). Surgery was performed under general anesthesia with strict aseptic precautions. Positive pressure ventilation (PPV) was applied to manage pneumothorax. The wound site was thoroughly cleaned, debrided, and prepared for implantation. The BioGraft was placed using the underlay technique, positioned beneath the surrounding muscles, and secured to adjacent ribs with absorbable PGA 1-0 sutures.

Postoperative care included administration of carprofen (2 mg/kg PO, twice daily) and cefpodoxime (5 mg/kg PO, once daily) for 10 days, with the dog

Fig.2: Graphical representation of the clinical case report on the use of BioGraft for repair of thoracic wall in a dog; (a) Pre-operative preparation; (b) Implantion of Biograft; (c) Complete heating of the defect.

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closely monitored for any complications or adverse reactions.

The BioGraft successfully repaired thoracic wall puncture wounds in the dog, promoting site-specific tissue regeneration within 14 days. The extracellular matrix (ECM) scaffold facilitated constructive tissue remodeling, and a two-year follow-up revealed no complications. These findings highlight the potential of the BioGraft for thoracic wall defect repair in dogs.

In conclusion, implantation of the ovine rumen BioGraft provides a durable and effective approach for managing complex thoracic wall defects in canine patients, supporting site-specific tissue regeneration and repair, and offering a promising strategy for improved wound management in veterinary surgery.

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