

Sphincter Augmentation for Urinary Incontinence in Dogs

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Note Bene: The following paper is currently presented in abstract form only, as it is being presented for publication in appropriate peer-reviewed publications.

Urinary incontinence can be either an acquired or congenital condition most commonly found in larger breed dogs. The condition is often associated with oophorectomy. Medical treatments for this condition are reasonably effective and usually consist of phenylpropanolamine administered daily and/or estrogen therapy. Limitations to existing therapeutic modalities include the requirement for administration of daily medication, the expense of life-long medication, and the possibility of the development of resistance to medical therapy.

The field of tissue engineering / regenerative medicine is focused upon the reconstitution of tissues and organs using therapies that include either a cell-based approach, a scaffold-based approach, a bioactive molecular approach, or combinations of the above. The present study involves the use of an inductive scaffold comprised of extracellular matrix (ECM) derived from the porcine urinary bladder (UBM). All cells and cellular remnants are removed from this matrix material following processing. The material is sterilized by standardized methods including terminal sterilization with electron beam irradiation. A particulate form of this UBM scaffold was evaluated for its ability to effectively treat the clinical signs of urinary incontinence following injection into the internal urinary sphincter. 1.0 ml (33 mg) was injected into the 2:00, 6:00, and 10:00 position of the internal urinary sphincter via an endoscopic technique in seven dogs with medically refractory urinary incontinence. Three dogs with refractory incontinence were injected with the carrier alone that consisted of saline plus glycerin. Complete cessation of incontinence for a mean period of 6.6 months (range = 2-8 months) was observed in six of seven animals receiving a single injection of the ECM particulate injection. Animals receiving the carrier injection had recurrence of incontinence following 17 days (range = 1-4 weeks).

Based upon the known mechanism of action of the ECM scaffold and other body tissues, it is speculated that the ECM scaffold induces a constructive remodeling of the internal urinary sphincter. The major limitation of the present study includes the lack of histologic evaluation of sphincter remodeling. The study is still in progress, therefore the ultimate time to recurrence of incontinence in the treated dogs is not known with certainty.