

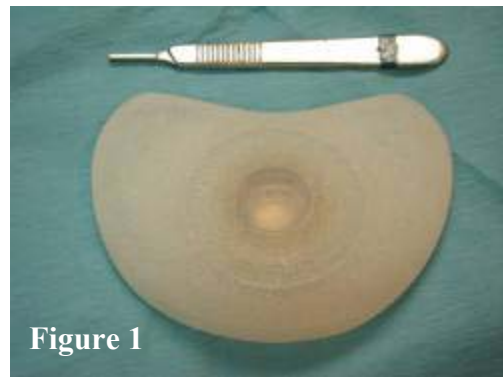
Skin Expanders: A Solution for Difficult Reconstructive Surgery Cases

Skin expanders are devices commonly used in human reconstructive surgery but rarely used by veterinary surgeons. They provide an opportunity to gradually expand skin and generate enough local tissue to cover preexisting or surgically created defects. This is particularly useful in humans, since we do not have easily movable or stretchable skin. The ability to acutely stretch and move surrounding skin to close a defect in dogs and cats makes the need for skin expansion a rare occurrence. However, in cases where the skin loss is severe reconstructive techniques such as axial pattern flaps, free microvascular flaps, and skin grafts may be required. Skin expanders offer an alternative to these techniques by recruiting local tissue to make closure possible, often with excellent cosmetic results.

In human reconstructive surgery, the device is implanted under an undermined pocket of skin adjacent to the defect or area of future surgery. The expansion typically takes months since the skin being stretched needs to gradually accommodate to the rising pressure of the expander and faster expansion rates may compromise blood supply. These devices resemble plastic balloons and are manufactured in different shapes and volumes depending on their intended use (round, oval or kidney shape, in volumes ranging from 100 cc to 600cc and more) (Figure 1). They typically have an injection port that can be found through the skin with the aid of a magnet.

To expand the device, the skin is aseptically prepared, the injection port located, and a variable amount of sterile saline is injected into the expander. Fast expansion rates are more practical and economical but little work has been done in the veterinary field

to determine the fastest expansion rate that would not compromise the viability of the overlying skin. This likely depends on where the expander is located, the patient's intrinsic skin elasticity and availability, and local skin blood supply. Research has shown that a daily expansion rate of 10 % of the nominal volume of the device, or 15 % every other day are possible, but faster rates would likely be tolerated in most cases.



CASE REPORT

A young Boxer sustained severe shearing skin injuries to the abdominal and inguinal areas as a result of having been hit by a car. The dog required several surgeries including a pancarpal arthrodesis and multiple wound closures. After attempting primary closure of the large inguinal skin defect it was obvious that a novel approach would be required to close the wound. (Figure 2) After

consultation with a local plastic surgeon, it was determined a tissue expander would help recruit adjacent skin and allow for wound closure. The skin expansion process lasted two weeks and the final surgery went extremely well. (Figure 3) Primary closure was achieved and healing was complete.



Suggested Readings

Spodnick, G J et al. Controlled tissue expansion in the distal extremities of dogs. **Vet Surg** 22, 6, 436-443, 1993.

Keller W G et al . Rapid tissue expansion for the development of rotational skin flaps in the distal portion of the hind limb of dogs: an experimental study. **Vet Surg** 22, 31-39, 1994.



MedVet Associates, Ltd.
300 E. Wilson Bridge Road., Worthington, Ohio 43085
(614) 846-5800, Fax (614) 846-5803

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