Reconstructive Surgery in the Dog and Cat

John Culvenor

Reconstructive surgery is used to repair large tissue deficits. The tissue loss is usually due to tumour resections, but can be due to burns, infection causing tissue necrosis and trauma causing tissue loss.

While many wounds in our patients can be managed quite simply with primary closure, secondary closure or just as an open wound, some of the larger wounds or those in awkward areas will require reconstructive strategies for closure. The ability of our patients to heal by secondary intention should not be forgotten. Many wounds that seem large and difficult can look much better once the debridement stage is over, and often will go on to heal without significant complications with just patience and good wound management. Large wounds can heal by contracture, where the skin edges are pulled together by the granulation tissue and by epithelialisation, where new skin grows in from the edges.

The most basic surgery of this type is a simple lumpectomy. An elliptical incision is made and the wound directly closed, but the surgeon needs to plan carefully if primary closure is not feasible. When making elliptical incisions around lumps, have the long axis of the incision in line with the tension line and not at right angles to it. A good example of this is a wound on the cranial aspect of the elbow. A transverse wound will be “pulled apart” every time the patient stands while a vertical wound will “pull together”.

Oncological surgical principles require good margins, but one needs to be prepared to deal with the remaining wound. Often on legs and around the vital structures the principle of wide excision has to be compromised to preserve function and vital structures. When a compromise is made then the consequences of regrowth must be considered.

The basic principles of wound healing should be remembered. Damaged and necrotic material needs to be removed. Fluid accumulations, movement, infection, poor blood supply and especially tension are all likely to interfere with healing and should be minimised.

Tension relieving techniques are helpful in smaller wounds that won’t pull together easily. The simplest of these is just underrunning the surrounding skin and then using “walking sutures” to help bring the skin into apposition. Simple Z-Plasty is also very helpful, especially around the head and perineum. Even patient positioning helps considerably and should be planned when prepping for surgery. For example, closing a scrotal ablation wound with the hind legs abducted is difficult, however sandbags holding the hind legs closer together will make it easier.

Local flaps are useful and only require a little imagination to find loose available skin that can be moved over the deficit. A single pedicle advancement flap with or without relieving
triangles is the most useful. Also available are bipedicle flaps and rotational flaps. Forelimb and hind limb skin fold flaps are useful in nearby areas.

Direct distant flaps, where the denuded leg is passed under the skin on the flank, are not often used these days as they require awkward bandaging and are not well tolerated.

Axial pattern flaps are very useful and will solve most problems on the trunk and on the legs as far distally as the elbow and stifle. The thoracodorsal flap and the caudal epigastric flap are the most reliable and useful. There are several other flaps described and the surgeon should browse these in a text book to “shop for options” for the problem at hand. Even the thoracodorsal flap, which is probably the second most reliable after the caudal epigastric flap, will fail to some extent and need some revision to debride and close avascular flap edges that may develop (Aper 2001).

Free skin grafts are useful for distal limb areas that cannot be reached easily by flaps. The recipient area must be healthy and vascular and ready to provide nutrition. The skin should be harvested from the trunk and from an area which is easily closed. The subcutaneous fat should be removed until the deep layer of the dermis is exposed. The graft is meshed to allow conformity, expansion and prevent exudate from the donor bed lifting it. The area should be firmly bandaged to ensure stability and close contact with the underlying bed. This makes free skin grafts hard to apply on the trunk. The dressing should be changed about day 4, at which stage the grafts usually look necrotic. I usually change the dressing every 2-3 days after that and it is not until day 10 or so that the necrotic areas should be debrided from the areas which have taken.

REFERENCES:


Books:

Reconstructive Surgery and Wound Management of the Dog and Cat. J. Kirpenstojijn @ G. ter Haar. Manson 2013