

Skin tumors and reconstructive surgery

When?

Skin tumor and other tumors are removed with margins based on the type of tumor.

After tumor removal, several options might be available for closure.

Traumatic wounds might need reconstructive surgery for closure as well.

The type of closure is decided upon based on how big the defect is, the amount of moveable skin around the site, the location of the defect.

Ideally wounds are fully closed, but in some cases (parts of) wounds might be left to heal by second intention.

Tumor removal options:

Incisional biopsy: In this option, a piece of the tumor is removed to obtain a diagnosis, but the tumor is still present, and will still need to be treated later.

No margins/excisional biopsy: The tumor is removed along its edges. No margins are obtained. This can be done as a diagnostic option, or in places where wide margins are not possible, for benign tumors, or with the intent/plan to follow up with radiation therapy after surgery.

Wide margins

A margin of normal looking tissue is taken around and deep to the tumor. The amount of tissue that we plan to take depends on the type of tumor, as some cancer grows more into the local tissue than others. In some cases, imaging (such as CT) is performed to plan the surgery.

Frequently treated tumors are:

Mast Cell Tumor

This is a tumor that can spread to lymph nodes, liver and spleen. The cells of the tumor (mast cells) can degranulate and it's contents can cause local bleeding or GI ulceration. Pretreatment prior to surgery is recommended to minimize the risk of this happening. Wide margins are recommended for this tumor.

Soft Tissue Sarcoma

This is a tumor that grows into the local tissues but is not always quick to spread/metastase. Wide margins are typically recommended, but in select cases (for example tumors on the legs/wrist in older dogs) a marginal excision can be performed to remove the tumor and watch the incision for recurrence.

Lipoma

This tumor is a local accumulation of fat. It can be under the skin (subcutaneous) or between muscle layers (inter muscular lipoma). Wide margins are not needed. If the tumor is large, the pocket left behind might be large as well, and might be prone to seroma development



A special type is fat growing into muscles – with no separation between muscle and fat. These cannot be removed w/o removing the entire muscle as well.

Sebaceous gland adenoma

A benign tumor of one of the skin glands. Wide margins are not needed.

Squamous cell carcinoma

A malignant tumor that can be seen in a variety of locations, such as the ear, toes, tail. A resection with wide margins or tissue that is a good barrier (such as the ear canal) is needed.

Closure options:

Often a wound, incision or resection can be closed normally without having to perform additional reconstructive techniques.

Different reconstructive techniques are:

Skin stretching

This can be done as a preplanned intervention prior to surgically removing a mass over an area where not a lot of skin is present to safely close a defect. This can only be performed in planned surgeries that can be scheduled in two steps several weeks apart, and would involve two surgeries. An inflatable expander is placed under areas of healthy skin adjacent to a skin defect or mass to be removed. It is slowly inflated with saline over a period of time to allow the skin to stretch while maintaining its circulation to a size appropriate to then be used for primary closure or as a local flap to cover the defect without tension.

Another option is to prestretch skin using glued on Velcro straps externally. This might not get the same amount of stretching, but does have the benefit of not needing a second surgery as this can be performed under sedation.

Local Flap

These can be advancement (moving an area of skin into a defect in a straight line) or rotation (rotating an area of skin into a defect). The base of the flap remains attached, thereby preserving blood supply.

This is commonly performed in areas where the defect is smaller or closure of the defect is needed to protect underlying tissues, or reconstruct an area of the mouth. If larger defects need to be closed, a larger option is the axial pattern flap.

Axial Pattern Flap – is a pedicle graft that incorporates a known direct cutaneous artery and vein at its base. These flaps tend to have better circulation than local flaps whose circulation depends on a subdermal supply alone. Depending on the location of a skin defect, will determine where the flap arises from.

Free Skin Graft

This is commonly performed in areas where no other options are available for closure. A healthy woundbed or healthy tissue with good blood supply is needed for the graft to

survive. It cannot be performed directly on bone, and typically requires initial wound management to prepare the site. A segments of skin is completely detached from one site on the body and transferred to a defect in another site of the body. Typically a heavy bandage, or a Negative Pressure Wound therapy device is placed postoperatively and kept in place for several days, as it is imperative that there is no motion of the graft for several days postoperatively.

Complications:

There are always risks associated with general anesthesia. Risks can be increased by the overall health of your pet and any concurrent disease he/she may have.

Complications specific to tumor/cancer removal include:

- Delayed/poor wound healing
- bruising (for example due to degranulation of a Mast Cell Tumor)
- incomplete margins (tumor cells histologically seen at the edges of the removal)
- margins complete but small: in some cases, where a wide margin was planned, the histological finding of tumor cells close to the edge might warrant further therapy. This could be a scar revision, or radiation therapy.

Complications specific to skin reconstruction include:

- Necrosis of part or all of the flap/graft
- Infection,
- Dehiscence of the closure
- Edema, seroma/hematoma formation

Postoperative Care:

In hospital care:

- We would typically keep your pet the first one or two nights after surgery for a scheduled procedure – but this might be longer if we place a drain, or did a free graft.
- An E-collar must be worn during the first 10-14 days to allow the incisions to heal.

At home care:

- We would still recommend wearing an E-collar, and leash walks/exercise restriction for the first 10-14 days after surgery to allow all the incisions to heal.
- Close inspection of the incision and wound is advised: things to look at are: gapping of the wound, swelling around the wound discoloration of the wound, drainage of the wound, or if your pet suddenly becomes more painful in the wound area/suddenly becomes more interested in the wound (trying to bite/scratch at it).

Prognosis:

Based on the tumor, based on the reason for the wound.