Cancer in cats and dogs: Surgical therapy
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The role of surgery in the management of the patient with cancer

Surgery is commonly used in the management of solid tumours (i.e. tumours that are 'lumps' rather than tumours such as leukaemia that are not just in one place) in dogs and cats. Surgery may have a number of roles to play in the management of cancer:

- Surgery for **diagnosis** (biopsy)
- Surgery for **prevention** of cancer, i.e. removal of abnormal tissue before it becomes cancerous (e.g. pre-malignant change such as polyps), or removal of other tissue (e.g. testicles or ovaries) to prevent hormone-dependent cancer
- Definitive **curative-intent** surgery, i.e. surgery designed to remove all of the tumour and cure the patient of that tumour
- **Cytoreductive** surgery, i.e. surgery designed to remove most of the tumour and leave only microscopic deposits of tumour cells so that additional therapy (e.g. radiotherapy or chemotherapy) will be more effective
- **Palliative** surgery, i.e. surgery designed to improve the patient’s quality of life without necessarily extending the duration of life
The role of biopsy before surgical treatment

We need to understand what the role of surgery in any patient is before the operation is performed, so that it is as clear as possible what benefit the patient is likely to receive. This will generally require that a biopsy is obtained prior to other surgery, to identify the nature of the tumour. We will discuss these issues and the results of the biopsy with owners at each stage.

However, a biopsy may not be performed in the following circumstances, which are occasionally encountered:

- If the results of the biopsy would not change the plan for treatment, i.e. the treatment is the same regardless of the nature of the tumour
- If the results of the biopsy would not change the owner’s willingness to treat, i.e. if a particular treatment would be chosen, whatever the tumour is
- If the biopsy procedure is as invasive or difficult as surgical excision, i.e. to avoid two major surgical procedures

However, if we do not have information provided by a biopsy, we may be faced with an increased risk that the entire tumour is not subsequently removed and that a cure is not obtained.

Types of surgery

Curative-intent surgery

Curative-intent surgery (surgery designed to remove all of the tumour and cure the patient) represents the best option for many tumours, but it is only appropriate for a tumour or tumours in one location, with no evidence of spread. Surgery cures more patients of their tumour than any other treatment (e.g. radiotherapy, chemotherapy) and consideration is always given to surgery if it is possible.

The advantages of surgical management of cancer are:
- It provides an immediate cure (in appropriate circumstances)
- It does not cause cancer (as radiotherapy and chemotherapy might do)
- It has no toxic side effects
- It does not suppress the immune response
- It is effective for large masses, whereas radiotherapy or chemotherapy are not

Surgery may be combined with other types of treatment including chemotherapy and radiotherapy. Generally these additional therapies are used post-operatively, once the amount of tumour in the body has been reduced to as low a level as possible, to delay or prevent return or spread of the tumour. However, in some cases, these other treatments may be used before surgery to make the surgical procedure simpler or more likely to be successful.

When considering surgery for the management of cancer, the following principles should be borne in mind:

- A diagnosis should be established to help plan the surgical procedure
- Diagnostic imaging (X-rays, CT scan) should often be used to assess the extent of the tumour and improve our ability to plan the surgical procedure
- Surgery should be performed early in the course of the disease when the tumour is small, rather than allowing it to grow larger
- The first surgical procedure for any particular tumour has the best chance of success. If the tumour recurs after one surgery has been performed, it is difficult to know where the tumour now extends to
- Surgery for cure involves removing the tumour and a margin of normal tissue in 3 dimensions

It is important to realise that while curative intent surgery has a good chance of curing the patient of that tumour, the pet may develop additional new tumours in the future.

Cytoreductive surgery

Cytoreductive surgery involves the removal of all the tumour that can be seen with the naked eye, but accepts that microscopic deposits of tumour cells will be left behind and the patient will not be cured with surgery. However, reducing the number of tumour cells in the body increases the effectiveness of post-operative radiotherapy or chemotherapy, as these two types of treatment are less effective when dealing with a large mass.

This therapy will probably not produce a cure, but will often provide long-term local control, i.e. will prevent the mass from regrowing for as long as possible and will delay the signs of ill-health due to the tumour for as long as possible. Cytoreductive surgery generally involves a more minor procedure than surgery for cure and the recovery time after surgery is therefore generally shorter.

Palliative surgery

Palliative surgery is designed to remove a tumour that is causing signs of illness, while accepting, as for cytoreductive surgery, that this will not cure the patient. This surgery may be performed for tumours that are causing pain and discomfort or that are infected or ulcerated. Often this is a more effective form of pain relief than painkilling drugs alone. Usually, the simplest type of palliative surgery that will provide an improvement in the animal’s health is chosen, to maximise the benefit of this surgery, avoid a long recovery time and minimise post-operative complications.
Other considerations prior to surgery

For more radical surgery and, in particular, surgery that alters the appearance of the pet, e.g. surgery of the head and neck or amputation of a limb, pet owners understandably often have two concerns:

• How will surgery alter the cosmetic appearance of my pet?
• How will surgery affect the ability of my pet to lead a normal, happy life i.e. to function normally?

These questions are usually asked in that order. On reflection, we would probably all regard normal function to be more important than a normal appearance. However, the physical appearance of a pet is still an important factor in decision-making. This decision may sometimes be made easier if the pet is otherwise well and if radical surgery offers the potential for a cure, and if without therapy the tumour will likely lead to the pet being put to sleep.

Wound healing may be delayed or impaired in patients with cancer and a wound infection may be more common. This is as a result of the adverse effects that the tumour has on the body, and the effects of the therapy itself.

Surgical margins and types of surgery

If we are using surgery to attempt a cure, we will aim to remove the entire tumour along with a margin of normal tissue, to do all we can to ensure that all the tumour is removed. This margin of normal tissue is not exact and is our best guess at how far the tumour has invaded into the adjacent tissue.

Around the tumour, these margins are normally measured in centimetres, with more invasive tumours having wider margins (e.g. 3cm) than less invasive tumours (e.g. 1cm). Below the tumour, these margins are either measured in a similar way, or a natural barrier to tumour invasion is chosen, so that the tumour is removed with this barrier intact, as though removing the tumour in an “envelope” of normal tissue. A benign tumour may be removed with very narrow margins. In some locations, adequate margins of excision cannot be achieved while still preserving the function of the affected body part and a cure may not be achievable.

Cytoreductive surgery and palliative surgery procedures will generally remove the tumour with a narrow margin of tissue, as a cure is not anticipated.

Wound reconstruction

All surgical procedures for the management of cancer involve two steps:

• Removal of the tumour
• Reconstruction of the wound

Often, removal of the tumour is relatively straightforward, whereas reconstruction of the wound can take longer and be more of a challenge. The ability to close the wound in some way after surgery may dictate whether the tumour is considered operable. Normally several options are considered for closure of the wound in the planning stage, so that we have the best chance possible to provide a good outcome.

Post-operative pain management (analgesia)

We cannot discuss surgical management of cancer without discussing post-operative pain control (analgesia). Before embarking on any surgery we have to be sure that we can provide adequate analgesia for all our patients, irrespective of the underlying disease and the surgical procedure performed. It is also important to realise that for certain tumours, surgically removing the tumour is an effective means of providing pain relief, and as a result some patients are more comfortable in the immediate post-operative period than they were before surgery.

At Willows we have a team of anaesthetists who work very closely with our Specialist surgeons and other members of the oncology service to ensure that all of our patients are kept as comfortable and pain-free as possible.

We aim to use analgesia drugs before there is any pain or discomfort (pre-emptive analgesia) in our patients and to use a combination of analgesic agents of different types that work in different ways and act at different sites in the body. As a result, our patients will often receive an aspirin-like drug (a non-steroidal anti-inflammatory drug; NSAID), a morphine-like drug (an opiate) and a local anaesthetic, as well as other types of drug.

Post-operative care

Patients will normally be kept in the hospital after surgery until the nursing care and analgesia that they need is relatively minor and can be provided by the owner at home. Instructions for post-operative care may comprise:

• Examination of the wound daily for any evidence of inflammation
• Administration of drugs, e.g. analgesia, antibiotics
• Exercise restriction until the surgical site has healed sufficiently
• Methods to prevent the patient licking or scratching at the surgical site.

Assessment of the tumour specimen and monitoring of the patient

Once the tumour is removed, it will normally be sent to the laboratory for assessment, even if a biopsy was obtained beforehand,
as a larger sample can often provide additional information. Examination of the tumour specimen post-operatively may provide the following information:

- Confirmation of the type of tumour. In certain tumours, particularly those with various cell types in it, a small sample (such as that obtained at biopsy) may not be representative of the actual type of tumour
- Identification of the tumour grade, if this could not be assessed pre-operatively
- Evaluation of the local lymph nodes (glands) if these were not accessible before surgery, but could be sampled at surgery
- Assessment of the tumour margins as to whether all the tumour has been removed. This helps to predict the likelihood of tumour recurrence at the surgical site
- Identification of invasion of the blood vessels and lymph vessels by tumour cells. This helps to predict the likelihood of distant tumour spread elsewhere in the body

Our aim at every stage is to make sure that owners of pets undergoing surgical treatment for cancer are fully informed and understand what is being recommended and why. We will discuss possible complications and the likely costs involved ahead of time, and we will only undertake surgery with an owner’s fully informed consent and understanding.

*If you have any questions about your pet’s condition, or his or her treatment, please do not hesitate to contact us.*