

CANINE LOW-GRADE MAST CELL TUMOURS



What are mast cell tumours?



Mast cells are part of the immune system, helping to control inflammation and get rid of parasites. They are central in allergy development as they store chemicals (e.g. histamine) which strongly promote inflammation and release these chemicals when the allergy is triggered. Sadly, mast cells also develop into tumours more commonly in dogs than in any other species, and even more frequently in some individual breeds. The majority of dogs have low to intermediate-grade mast cell tumours in their skin, and this will be the focus of this information sheet, which also contains much information for clients whose dogs do not yet have a grade as they have not yet had surgery. Many flat-faced (brachycephalic) breeds (e.g. bulldogs, boxers, pugs) will develop low to intermediate-grade mast cell tumours, often multiple tumours at the same time.

Symptoms

Mast cell tumours can cause problems at the site of the tumour, and around the body if the tumour spreads. The chemicals within the tumour cells can also cause local or widespread symptoms.

Most clients notice a mass in the skin which might even increase and decrease in size due to localised chemical release. Over time, there is typically an increase in size. Your vet might offer a needle sample of the mass, confirming a mast cell tumour is present. There is a huge variation in how aggressively an individual tumour will behave, and we have several tests to better understand an individual tumour's behaviour. The results help guide the best therapy.

Some signs which might suggest aggressive behaviour are fast growth, ulceration/weeping, itchiness, tight clustering of multiple tumours, and tumours in hairless areas. More reliable ways to predict aggressive behaviour include looking for the spread of the tumour.

Staging

Typically, less than 20% of low/intermediate grade mast cell tumours try to spread around the body, but when they do, they mainly spread to the local lymph node, and sometimes to the liver and spleen, although they can spread to any location/organ. Taking samples from the lymph node, liver, spleen and other organs is called staging. If we find cancerous mast cells in the liver and spleen, survival times are routinely short and are maximised with medical therapy after surgery. There is less consensus where the spread is only found in the lymph nodes, as these can be removed, but most research also supports the benefit of medical therapy after surgery.

We commonly offer staging early on so that the best decisions on the use of surgery, radiation therapy and/or medical therapy can be made with as much information as possible, also leading to the most precise estimates of the outlook for each patient. We might suggest the removal of a local lymph node, even if a fine needle sample has not revealed any spread, as complete removal and analysis of the node is the best way to assess it for spread. It is also a beneficial treatment where the spread is confirmed.

Treatment



Surgery is the ideal treatment for most low to intermediate-grade mast cell tumours as only a minority spread. Surgery will comprehensively draw a line under these tumours in most patients. After surgery, we will know the grade, which is the most reliable method of assessment of the aggressiveness of an individual tumour. It is possible for a very small minority of even low-grade mast cell tumours with no other worrying features to spread and become life-threatening.

The microscopic analysis of the tumour after surgery will also have some important information other than grade. These include the margins (an assessment of how much normal tissue lies between the incisions made in the tissue and the tumour cells). Margins are important as those with contaminated or narrow margins are at risk of recurrence of the tumour and usually benefit from additional surgery or radiation therapy. We can also assess the amount of reproduction within the tumour by several methods which is associated with risk of recurrence, spread, and shorter survival. There are also some genetic tests looking for mutations which are also associated with worse outcomes.



We see some patients with a mass which has not been investigated, others who have had surgery, and still others who have had staging performed. In most cases, we reach a point where we have the results of staging and grading (the microscopic assessment of the removed tissue), which are the most reliable factors that allow us to make a treatment plan. For patients with a risk of recurrence, usually due to incomplete margins, we often recommend further surgery with our specialist surgeons, often with the removal of local lymph nodes. Where further surgery is not possible, we can also offer **radiation therapy**, which is where high-energy radiation beams are aimed at the affected area. We might advise daily or weekly radiation treatments depending on the individual features of each case. Although we can use radiation therapy on its own against tumours, the benefit is far greater where the bulk of the tumour has been removed with surgery, followed by radiation therapy.

For patients where there is a minimal risk of recurrence but there is confirmation of spread to any internal organs, we often recommend **medical therapy**, either chemotherapy or receptor tyrosine kinase inhibitor (RTKi) therapy. This is not a common scenario in low to intermediate-grade tumours. Some patients do not have strong indicators (margin status, stage, grade) of further surgery or medical therapy being necessary but might have other worrisome features, and your oncologist will discuss the possible use of further therapy based on these factors.



Our preferred chemotherapy for most dogs with aggressive mast cell tumours is vinblastine, which is given weekly for four doses followed by fortnightly for four more doses on an outpatient basis, meaning 8 visits given over 12 weeks in total. Chemotherapy for veterinary patients is very different to the experience in human chemotherapy, and all of our chemotherapy drugs are used at a dose which gives less than 20% of patients side effects. If side effects develop these are typically mild and brief. Vinblastine tends to be even better tolerated than most veterinary chemotherapy drugs, so we expect very few side effects. We can decrease the dose of chemotherapy and add supportive medication in patients who are sensitive to the standard chemotherapy dose, so most patients retain excellent

quality of life throughout chemotherapy. We certainly do not want to decrease the quality of life in any of our chemotherapy patients.

Although not technically chemotherapy, RTKis also oppose cancerous mast cells throughout the body by turning off growth signals in the cells. The RTKis are given at home by the owners, with check-ups including blood and urine samples every few weeks, and they are designed for long-term use. The RTKis have a reasonable rate of side effects, but most are mild and can be managed by tweaking the dose.

Some clients decline surgery, radiation therapy and/or medical therapy, and we can offer **palliative care** to support a patient's quality of life without treating the tumour directly. This is mainly achieved through medications, such as anti-inflammatories, antihistamines and antacids. If palliative care is preferred by the client, most often the patient will return to the care of their local vet, but we can liaise with your local vet should they wish.

Outcome

On finishing therapy, we generally offer a monitoring programme with check-ups either at Southfields or your local vet a few times a year. This is because we acknowledge that at least 25% of dogs will develop a second, unrelated mast cell tumour in the future and early detection/treatment is best, but also sometimes spread from the first mast cell tumour only emerges months later.

The above is a classical approach, but mast cell tumours can be very variable. This can change our approach, for example, sometimes we offer medical therapy first to make an impossible surgery become possible after tumour shrinkage. There are also emerging treatments which might become more established, such as Stelfonta™, electrochemotherapy and immunotherapy but these are considered less established than surgery, radiotherapy and chemotherapy. Ask your oncologist for an update on current treatment options in case these have changed since this document was written.

Not all of the treatment options outlined above are appropriate for all patients. Your final choice between treatment options for your pet will be made in conjunction with your oncologist. If you have any concerns about your dog, please seek veterinary attention immediately.

If you have any further questions, please do not hesitate to contact the hospital.



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