

# CANINE HIGH-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 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. This information sheet is for patients who have been diagnosed with a *high-grade mast cell tumour*.

## Symptoms

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

Most owners notice a mass in the skin, typically protruding, and may be red and rubbery, which might even increase and decrease in size if there is localised chemical release. Over time, there is typically an increase in size, and this growth can be rapid. 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 spreading mast cells.

## Staging

Typically, most high-grade mast cell tumours will spread around the body, mainly 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 when 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. There is also a classification system that assesses the degree of spread in the lymph nodes after removal and based on that (alongside other factors), we decide if adjuvant chemotherapy is required.

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. This also leads to the most precise estimates of the outlook for each patient. It can be difficult to tell the difference between normal mast cells and cancerous mast cells on microscopic analysis, so staging is not always clear. We, therefore, might suggest the removal of a lymph node, even if a needle sample has not revealed any spread, as complete removal and analysis of the node is the best way to assess it for spread, and is a beneficial treatment where spread is confirmed.

Finally, it is worth pointing out that some oncologists regard staging as optional because even if all the results are favourable initially, it does not rule out the spread in the future. Therefore, even with favourable staging results, we still highly recommend medical therapy for the longest survival.

## Treatment

Even though we expect spread from high-grade mast cell tumours, surgery is still a major component of treatment. Even if there is spread to the internal organs, there is research which shows that removing the tumours in the skin is still beneficial. This might be through minimising the burden of mast cell tumour that any subsequent medical therapy has to deal with.



The microscopic analysis of the tissue removed at surgery will 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 tumours with narrow or incomplete margins are at risk of recurrence of the tumour and usually benefit from further surgery or radiation therapy. We can also assess the amount of reproduction within the tumour which is associated with the risk of recurrence, spread, and shorter survival. There are also some genetic tests look for mutations which are associated with worse outcomes.



For patients with a substantial risk of recurrence, usually due to narrow or incomplete margins, we often recommend further **surgery** with our specialist surgeons around the tumour site, often with the removal of local lymph nodes if they have not been removed already. 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 dosing 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.

Many high-grade mast cell tumours will have spread to the local lymph nodes, liver and/or spleen at the time of diagnosis, and if this is not the case, there is a very high chance of this spreading within a few months after surgery. Therefore, all our high-grade mast cell tumour patients are recommended to have medical therapy to maximise their survival. **Medical therapy** consists either of chemotherapy or receptor tyrosine kinase inhibitor (RTKi) therapy.

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 quite different to the experience in human medicine. 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 don't 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. These drugs 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. These drugs have been specifically designed to treat mast cell tumours in dogs.

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 monitoring with check-ups either at Southfields or your local vet a few times a year. This is because it is rare to achieve long-term remissions in dogs with a high-grade mast cell tumour. Historically, research studies measured the average survival in months, but more recent studies have reported average survival times over 3 years. We also offer to monitor patients because at least 25% of dogs will develop a second, unrelated mast cell tumour in the future and early detection/treatment is best.

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 with tumour shrinkage. There are also emerging treatments which might become established, such as Stelfonta™, electrochemotherapy and immunotherapy but these are less established than surgery, radiotherapy and chemotherapy. Ask your oncologist for an update on current treatment options.

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.

