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Mast Cell Tumours in Dogs

What are mast cell tumours?

Mast cell tumours are the most common type of skin tumour in dogs. Mast cells are always found in the skin, where they play an important role in inflammatory and allergic skin conditions. However, if mast cells begin to replicate in an uncontrolled way, they can form a skin mass full of abnormal mast cells and this is a mast cell tumour.

What causes mast cell tumours?

Usually there is no specific reason for a mast cell tumour developing - it is just bad luck. However, we do know that some breeds are more likely to develop these tumours than others, so genetics are likely to play a large part.

What does a mast cell tumour look like?

Mast cell tumours vary in size and appearance. They are often 1cm domed, firm, slightly red masses on the skin surface, but they can also occur deeper beneath the skin and can be much bigger in some cases.

What are the problems caused by a mast cell tumour?

Mast cell tumours may not bother the dog at all, or they may feel very itchy and cause the dog to chew and scratch at the mass.

Mast cell tumours can also release chemicals into the bloodstream which can cause stomach irritation, resulting in vomiting and poor appetite.

Mast cell tumours can be low or high grade. The low grade mast cell tumours tend to stay in one place in the body, and if they are removed, the condition is sorted. The high grade mast cell tumours can spread in the blood and lymph systems and can be life threatening.

How is a mast cell tumour diagnosed?

The most common way to diagnose a mast cell tumour is by taking a fine needle aspirate. This is a quick and easy test that can usually be performed in the consultation with no sedation. A small needle is placed into the mass and moved up and down. The needle is then withdrawn and the cell sample that has collected inside the needle is spread onto a slide and examined under the microscope.

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Occasionally, if masses are very small, in a delicate area, or the dog is not cooperative, the fine needle aspirate will be performed under sedation.

How is a mast cell tumour treated?

If a mast cell tumour is diagnosed, surgery is always recommended. If at all possible, the mass should be removed with 2-3 cm of normal skin around the tumour, and a barrier of muscle or similar tissue beneath the tumour. This should make sure that the tumour does not come back in the same place.

This can mean that very large skin wounds are created when a mast cell tumour is removed properly. In some locations, where there is a lot of loose skin, this is not a problem and closing the wound at the end of surgery is straightforward. In other cases, skin flaps and other reconstructive techniques are required to close the wound. On the lower limbs, it is obviously not possible to remove such a large amount of skin and in these situations it is recommended to remove the mass without any extra skin and then use other techniques (such as radiotherapy or chemotherapy) to mop up any cancerous mast cells that are left behind.

What happens next?

The mast cell tumour is sent away to the lab after removal. The lab are able to confirm that the tumour is a mast cell tumour, and also let us know whether we have been successful in obtaining a clear margin of normal tissue around the tumour (ie the tumour has been completely removed). They are also able to tell us what grade of mast cell tumour we are dealing with (this cannot be found out from the original fine needle aspirate).

If the tumour has been completely removed and is a grade I mast cell tumour, no further action is required.

If the tumour has been completely removed and is a grade III mast cell tumour, further investigations (such as ultrasound scans) to look for internal spread are recommended. If there is spread to the lymph nodes, these should be removed in a second surgery. Chemotherapy is recommended for all dogs with grade III mast cell tumours, as this reduces the risk of spread to the internal organs in the future. Dogs that have evidence of spread already on the scan can still be treated with chemotherapy, but unfortunately tend to do less well than dogs that start the chemotherapy before any spread has occurred.

If the tumour has been completely removed and is a grade II mast cell tumour, we ask the lab to carry out an additional test on the tumour. This is called a ki-67 test and it can predict whether the mast cell tumour will act more like a grade I or a grade III tumour. IF the Ki-67 result is low,



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the tumour is likely to act in a low grade way and no further treatment is recommended. If the Ki-67 result is high, the tumour is more likely to behave aggressively and spread is possible. Therefore, dogs with a grade II, high ki-67 mast cell tumour should be treated the same as dogs with a grade III mast cell tumour and receive an ultrasound scan and chemotherapy.

If the tumour has not been completely removed from its location (the lab cannot see a clear margin of normal skin around the tumour) it is possible to perform a second surgery to remove more skin, or arrange radiotherapy to treat the area to mop up any cancer cells left behind. If the tumour is a grade I mast cell tumour, having a clear margin may not be very important anyway, and these cases may not require any further treatment.

What does chemotherapy involve?

If chemotherapy is recommended for your pet it usually takes the form of a tablet given daily at home (prednisolone) and an intravenous injection (vinblastine) given once a week for 4 weeks, and then once a fortnight for 8 weeks - 8 doses in total. A blood test is taken prior to giving the vinblastine each time, to check that the immune system is strong enough to take the chemotherapy.

The cost of the chemotherapy course outlined above is usually in the region of £2012 for a 20-30kg dog.

Some studies have shown that adding a third drug to the chemotherapy regime, (a tablet known as lomustine) makes the chemotherapy more effective. However, this drug is very expensive, increasing the cost of the chemotherapy to around £4913, and in many cases we do not include it.

Unlike in humans, we do not use chemotherapy in animals at a dose that we expect to cause serious side effects. The most common side effect is a drop in the immune system, which can increase the risk of dogs picking up other infections such as skin, bladder and eye infections. We always perform a blood test before giving the next injection of chemotherapy, to check that the immune system has not dropped too low, If it has, we delay the next injection for a few days until the immune system has had a chance to recover.

Other side effects may include poor hair growth, loss of whiskers and tummy upsets. The steroid tablets tend to cause increased thirst and sometimes weight gain. Lomustine can cause liver damage and additional blood tests are required to monitor this.

Overall, more than half of dogs on this type of chemotherapy suffer no side effects, and the majority of those that do, suffer only mild diarrhoea or poor appetite for a day or so after each



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dose. If side effects are more severe than this, chemotherapy is discontinued, or given at a lower dose in future.

What happens next?

Ultrasound scans are repeated at the end of the chemotherapy and then every 3-6 months to make sure that there is still no sign of new mast cell tumours developing internally.

If tumours do appear internally in the future, further chemotherapy (either with the same drugs, or a different drug) may be considered.

Are dogs that have had mast cell tumours more likely to develop new mast cell tumours in the future?

The above grading and scanning is designed to look for internal spread of the original tumour.

However, all dogs that have had one mast cell tumour (even if it was low grade and completely removed) have a chance of developing a completely new mast cell tumour in the future. If this occurs, the tumour should be investigated and treated in exactly the same way. Therefore, owners of dogs that had had a mast cell tumour removed, should check their dog regularly (for example, once a week, during grooming) and revisit the vet if any new masses are noted.

Summary

Skin masses should be tested with a fine needle aspirate.

If this shows that the mass is a mast cell tumour, it should be removed surgically with a wide margin of normal skin if possible, and sent away to the lab.

If the lab confirms that the mass is low grade and completely removed, no further treatment is needed.

If the lab finds that the mass is high grade, investigations should be carried out to look for spread, and chemotherapy should be considered to reduce the risk of recurrence.

Dogs should be checked regularly for internal spread after a high grade mast cell tumour has been treated.

All dogs that have had a mast cell tumour in the past should be checked carefully on a weekly basis in case they develop new tumours. If they do develop new skin tumours these are likely to



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be completely new tumours and should be treated in exactly the same way as the first tumour (usually complete surgical excision).

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