



Feline Aortic Thromboembolism (FATE)

FATE (Feline Aortic Thromboembolism) is a dramatic and painful condition with serious implications. It comes on suddenly and appears to paralyse the cat, causing one or both rear legs to become useless and even noticeably cold. The cat will hyperventilate and cry out with extreme pain. Despite the extreme presentation, the cat may be able to recover from the episode, but it is important to understand how this came to be in order to make decisions.

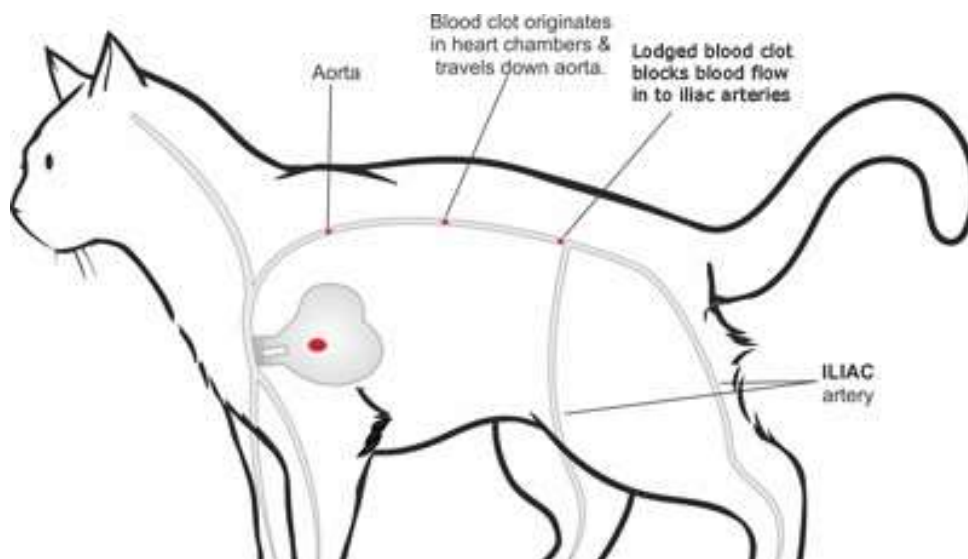
Thrombus: A large blood clot

Embolism: A small blood clot that has broken away from the thrombus and lodged in a vessel at a distant location

What is a Saddle Thrombus?

The aorta is the largest artery in the body. It stems from the heart itself, where it arches back and runs down the length of the body, ultimately splitting into the arteries supplying the back legs. The split where the aorta becomes the left and right iliac arteries is called the saddle.

A saddle thrombus is a blood clot that breaks off from a larger blood clot in the heart, travels down the aorta and lodges at the saddle. Not only is the blood supply to one or both rear legs cut off but a metabolic cascade results, leading to the release of multiple inflammatory mediators (especially serotonin). The muscles of the rear legs become hard, the foot pads become bluish in colour, and the condition is extremely painful.





Where did the Saddle Thrombus come from?

The saddle thrombus most commonly originates from a larger clot in the left atrium of the heart. This obviously begs the question as to why there would be a large blood clot in a cat's heart. In fact, more than 80% percent of cats with a saddle thrombus have heart disease.

Not every cat with heart disease will form a clot, in fact most will not; but there is presently no clear way to predict which cats will form these clots and which ones will not. In cats with hypertrophic cardiomyopathy, the most common form of feline heart disease, the size of the left atrium is one factor that is considered. The presence of "smoke" in the atrium during echocardiography (cardiac ultrasound) is another factor ("smoke" being wispy material seen in the circulating blood). Both these factors are considered controversial but when they are seen, most cardiologists will recommend some kind of therapy to reduce clotting tendency (i.e. a blood thinner). The problem is that, in order to go on preventative therapy, there has to have been a reason to see a cardiologist in the first place (heart murmur during a physical exam, heart enlargement incidentally found on a radiograph, abnormal blood test, or actual symptoms of heart disease). Most cats with aortic thromboembolism have had none of these things and the saddle thrombus is the very first clinical sign of an underlying problem.

How bad is the situation?

The outcome is variable but has potential to be very bad. Let's review the possibilities.

Best Case Scenario (saddle thrombus but no concurrent heart failure)

Cats uncommonly have a FATE episode unless there is an underlying heart disease, so it is not unusual for the cat in question to also have congestive heart failure (i.e. fluid backing up in or around the lungs), in fact, about half of them do. This, of course, means that about half of them don't. If there is only the thrombus and its associated pain to deal with, this makes the job simpler as the goal becomes pain control until the thrombus can dissolve and circulation can be restored.

That said, having a thrombus cutting off circulation to the legs can involve some very serious tissue damage and can be life-threatening. A lot of toxic biochemicals are generated in the damaged tissue and when the clot dissolves, these are released into the rest of the circulation and this event can be lethal even without heart failure. The clot damage can be severe, symmetrical and disastrous or it can create only a partial circulatory blockage and some improvement in limb function may be evident in a couple of days. Recovery of limb function can be complete or partial and it may take several weeks to tell.



Basically, for the cat with a thrombus and no heart failure, the take home points are:

- Treatment is largely about pain control and nursing care over the next couple of weeks.
- Even though heart failure is not present now, it is likely in the future, so evaluation by a veterinary cardiologist is strongly recommended.
- Blood thinners (anti-coagulation) will be needed to help prevent future blood clots.
- Even without heart failure, the cat may not survive the circulatory situation. There are parameters which can help determine this at the start (body temperature, heart rate, blood potassium level, blood pH).
- Full return of limb function may or may not occur.

Saddle thrombus with concurrent heart failure

In this scenario, the cat not only has the pain and paralysis of the saddle thrombus but is also in active congestive heart failure (CHF). Even if the thrombus situation resolves relatively promptly, with initial signs of limb recovery and acceptable pain control after a couple of days, there is still a life-threatening cardiac crisis to contend with. The heart failure alone may be lethal in the short term, but let's assume the heart failure can be controlled quickly with medication AND the recovery from the thrombus is in progress. The cat will need heart medication, blood thinners, and nursing care while the rear legs recover. Median survival of saddle thrombus cats with heart failure is 77 days while median survival of saddle thrombus cats without heart failure is 223 days.

Tissue damage from the thrombus

The good news is that permanent limb damage is the exception and not the rule, but it is possible. Some cats will lose skin or even muscle from the circulatory compromise. About 5% of cats will have tissue damage appearing as an open wound. As circulation returns, this sort of injury should heal. Another 5 percent will have more serious damage and the occasional cat will require amputation of a limb.

Rapid death from the tissue damage or heart failure

Many cats will die in the hospital. Some are simply overcome by heart failure. Some will develop another blood clot or multiple clots to a less survivable location, such as the brain or lung blood vessels. Some will suffer what is called a reperfusion injury when, as circulation returns to the limbs, toxic biochemicals from the limbs enters the main body of the circulation. Large amounts of potassium released from dying cells can be enough to fibrillate the already diseased heart.



Euthanasia

Because of the potential for repeat saddle thrombus episodes, need for regular medication administration at home, potential long-term treatment of heart disease, not to mention the seriousness & painfulness of the cat's initial predicament, 25% of pet owners elect euthanasia without attempting treatment.

Saddle thrombus in the absence of heart disease

We have only discussed saddle thrombus secondary to heart disease however clots occasionally form secondary to non-cardiac causes (most commonly cancer). A small percentage of cats will have no apparent cause. The cats with cancer usually have lung cancer, which is discovered when chest radiographs are taken to assess heart disease. Lung cancer is not the only type of tumour that can induce inappropriate clotting, so if heart disease is not found, a tumour search should be initiated with abdominal ultrasound. In this scenario, obviously the cat must contend with the thrombus recovery and medication to prevent future embolism, PLUS the newly discovered cancer and whatever treatments are available to address that.

Additional Resource:

<http://vetmed.tufts.edu/heartsmart/>

This is a very useful and well-written resource, providing pet owners with a clear and credible source of information about veterinary cardiology.