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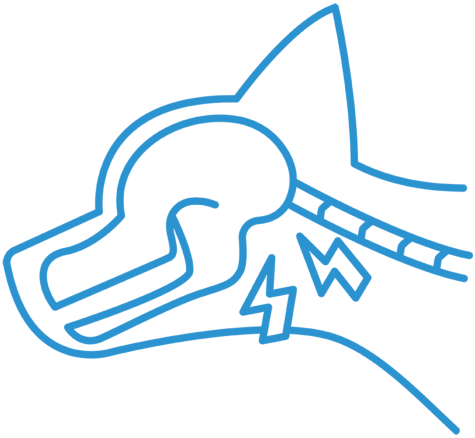
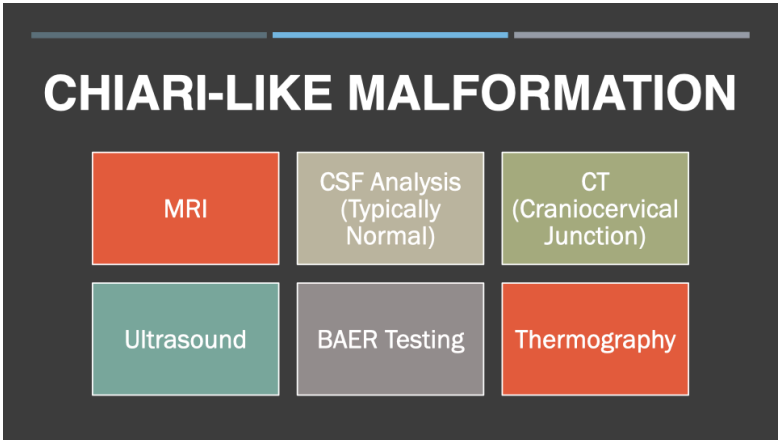


Myelopathies

drip 2

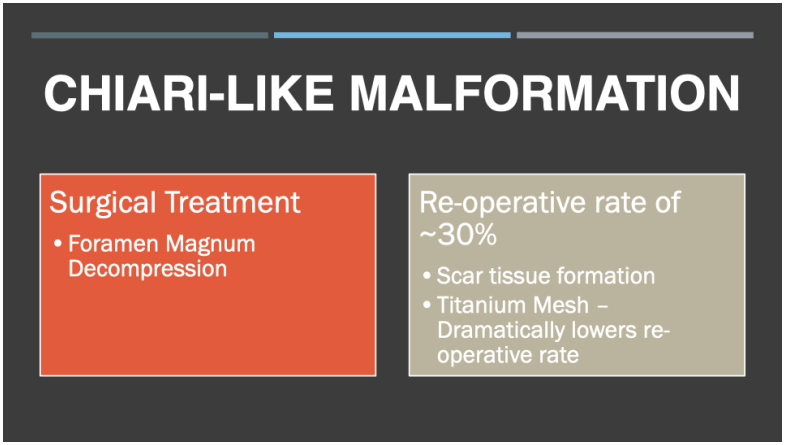
version 1

Instructor: Logan Donaldson
DVM, Diplomate ACVIM (Neurology)



Now that we know what to look for, how do we diagnose this? The big thing is usually MRI or CT. Sometimes when you're doing CSF analysis on these patients, we might want to consider ultrasounds of the area if we can find an open fontanelle to try to see if we can see some of that ventricular enlargement. Also consider BAER testing in some of these patients to see if they're hearing abnormalities or secondary to sensorineural deafness or if they're more associated with a conduction deafness what we would see in PSOM.

Thermography may also help us to look at some of the variations in the temperatures in the area and see if there's an abnormality that could help lead us in this direction. When we MRI these patients it's not uncommon to see these patients have other congenital abnormalities, such as things we've talked about in the past like hydrocephalus and quadrigeminal cysts. And so when we see these, we also have to adjust our expectations and our prognosis based off of are we dealing with one syndrome or could we end up having two or three individual syndromes.



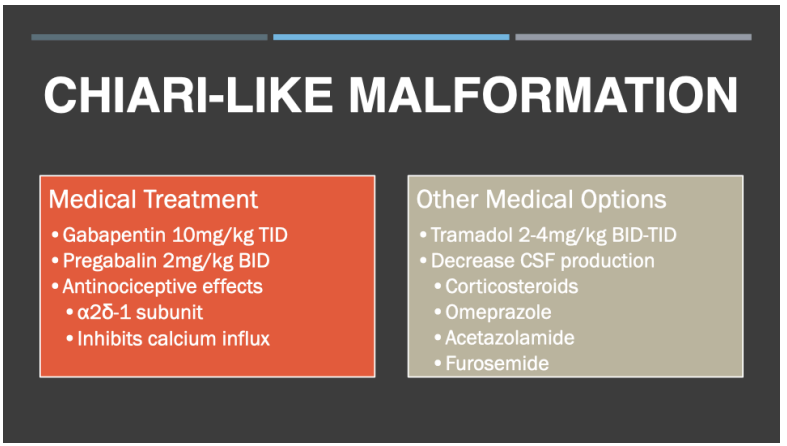
When we do this, and we have a conversation with the family, we always talk about, well, what options do we have available to us? And when we discuss these options, we have two big options to discuss. And one of those is surgical, one of those is medical treatment. Those end up being a lot of the time our options across the board, of course, but what is our surgical treatment

We're really looking at foramen magnum decompression and this is where we typically remove a portion of the occipital bone and the fossa area to relieve compression of that cerebellum. However, this does come with some complications and some studies have shown that there might be a reoperative rate of about 30%. Usually this is due to scar tissue formation in the area.

Since we're usually performing these procedures on younger patients that have more clinically severe diseases, they have a longer lifespan post-operatively, or we're anticipating a longer lifespan post operatively than we would if the patient was 10 or 11 when we were doing the procedure. There's more time for scar tissue to form. And so what's been proposed is to do a titanium mesh, usually using some other implants. And this has been shown in some unpublished data to dramatically lower the preoperative rate.

So there is some other data out there that may not change the reoperative rate as much as we had initially thought, but it certainly might do that. And so more information here could be very vital for us. There are some individuals out there that are actively working on 3D printing of these to dial them into the specific patient, which could help with some of this scar tissue formation that we've encountered in the past.

When we have these issues, we also say, OK, well, surgical treatment's not available to us for x, y, z reason or in conjunction with surgical treatment, what are the options in medical treatment?



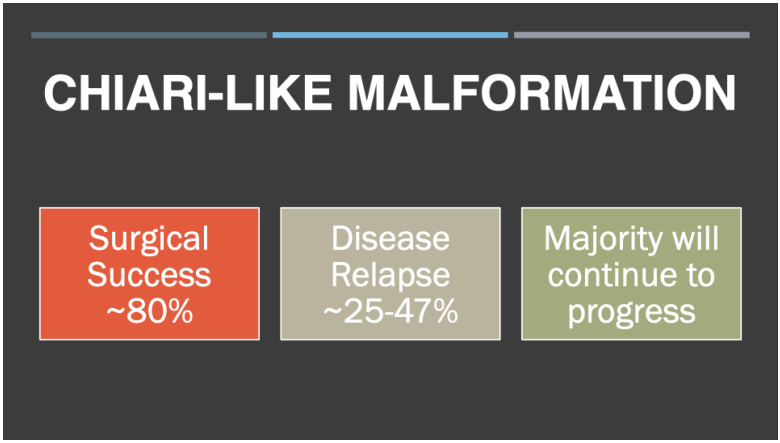
For our medical treatments, we're usually looking at a myriad of a couple treatments here. The big ones are controlling any pain or discomfort they may have with gabapentin or pregabalin. These will also help with some of those abnormal sensations that may cause scoliosis or may cause persistent scratching.

These tend to work through the alpha 2 delta 1 subunit, and they inhibit this; they cause anti-nociceptive effects by inhibiting the calcium influx in these neurons relating to what we see there.

When we're running using these medications, we usually use some kind of to effect a little bit. I tend to start my patients on three times a day and then gradually back down. If I can back down to twice a day or once a day, great. I do actually have some patients that are on higher doses of these medications or continue to need them post surgically as well.

There is some consideration of tramadol at 2 to 4 mg per kg might help as well. There are some other studies out there that just question the efficacy of tramadol in general in patients. I tend not to use tramadol in a lot of these patients. If I can't control their discomfort or their clinical signs with medical management, then I'm usually talking about trying to approach them surgically in these cases.

But the other thing we want to try to do is to decrease our CSF production. And this is where our friends of corticosteroids, omeprazole, acetazolamide, furosemide might come in. Same medical treatment that we would use for hydrocephalus. If you have a patient that also has increased ventricular size, this is going to help with that as well. Trying to treat two birds with one stone and trying to make sure that we are attacking the patient as a whole.



Let's assume we pursue surgery on these patients. The success rate is about 80%. About 80% of patients will have a pretty significant response to the treatment. Unfortunately, a large percentage of those patients relapse and some of those patients require repeat surgeries. Some of these patients relapse despite not having a ton of scar tissue formation and not needing repeat surgeries.

We tend to want to do these procedures in patients that are relatively mature, and so that allows us to not have to deal with any excess formation in a lot of those patients. But a lot of these patients will continue to progress, and a lot of them will still need medical therapy after surgery. These patients are going to the conversation with the family, saying, we're hoping that this is going to be our fix for us, but we can't be surprised if we end up having to still need some medical therapies afterward or if we're going to end up needing to repeat the surgery in some cases.

Unfortunately, about 35% of these patients that are on medical management alone are euthanized within about two years of diagnosis. And that's usually due to progressive deficits, or we end up finding other underlying congenital abnormalities or genetic diseases that cause them to have persistent and progressive neurologic decline.