Cranial Nerve Pathology

Cranial Nerves

The cranial nerves in feline and canine patients are similar to those in humans; there are 12 pairs or nerves, many of which serve similar functions and have similar naming conventions as compared to humans. This page will not be an in depth discussion of cranial nerve anatomy or specific pathology, but will focus on concise and applicable information for identifying pathology and selecting and using appropriate imaging techniques.

Most of the cranial nerves in veterinary patient are quite small and can be difficult to detect, even on fairly high resolution MRI scans. The nerves best visualized directly on MRI include the optic nerves, the trigeminal nerves, and the vestibulocochlear nerves / inner ear.

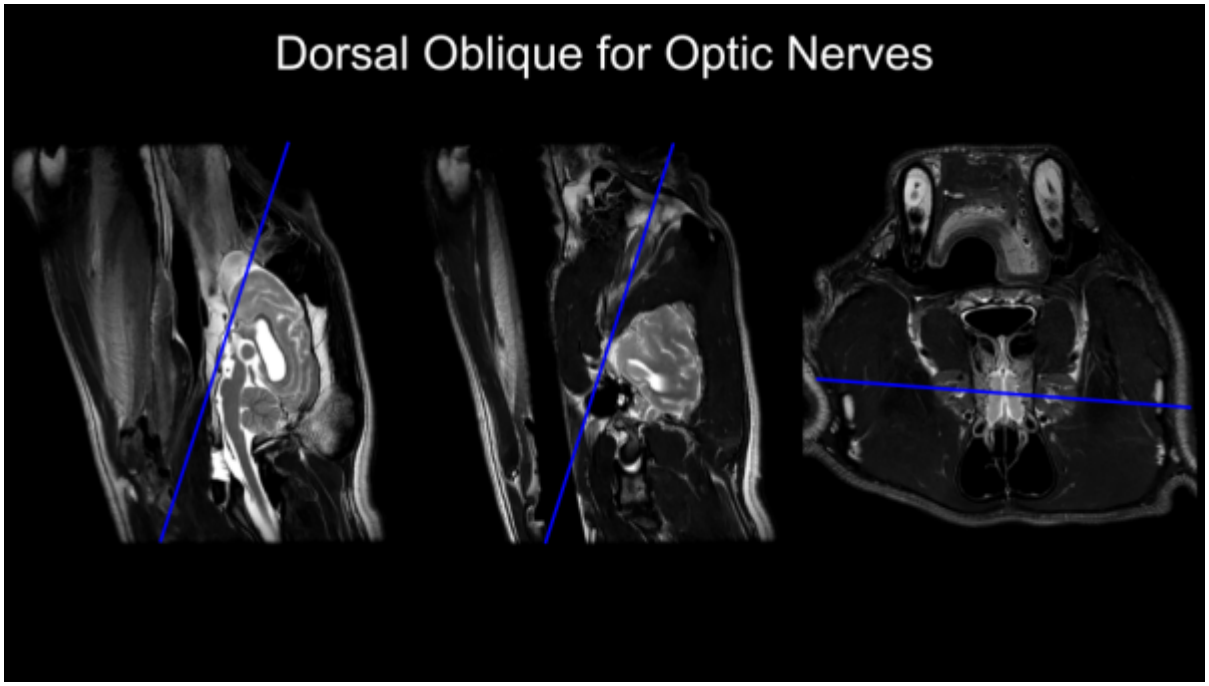
The Optic Nerves

The optic nerves are paired nerves extending from the optic chiasm, just rostral to the pituitary gland, toward the eyes in an oblique dorsal plane. The optic nerves are not as commonly affected as the other cranial nerves, but do require more special imaging when it is necessary to assess them. To best assess the optic nerves, consider a few things: The nerves are small, surrounded by CSF, cushioned in fat, well vascularized, and take a tortuous and oblique path between the eyes and the brain. Fat saturation and oblique angles will be required, FLAIR may be helpful to suppress CSF, and 3D Fast Spin Echo will help suppress the signal from blood vessels if available. Ideally, Dixon fat saturation and 3D T1 /T2 FLAIR is a great combo if it's available, otherwise 2D fast spin echo is the best choice.

Special View for Optic Nerves

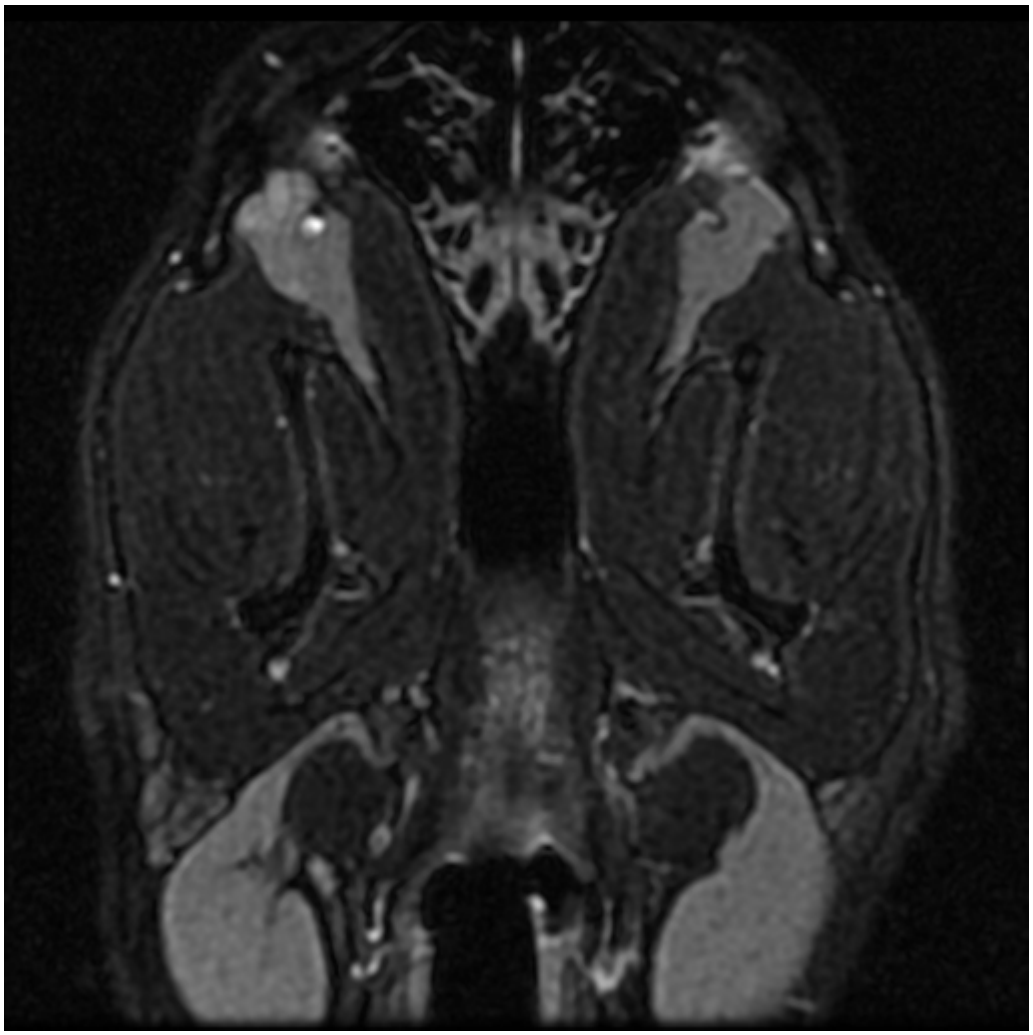
Dorsal Oblique:

1. Acquire normal sagittal slices, and ensure slice coverage and FOV includes the entire eye and brain.
2. Acquire normal axial slices, and ensure slice coverage includes the entire eye and brain.
3. On the Sagittal images, scroll back and forth and identify where the optic nerve exits the eye caudally, and follow it through multiple slices until reaches the optic chiasm. Choose an approximat angle here, roughly 45-ish degrees from the pituitary.
4. On the axial images, identify where the optic nerves exit the eyes, and follow the nerves back toward the brain, select a position about halfway, and adjust the left/right rotation that may be needed.
5. increase slice coverage to include the entire orbit



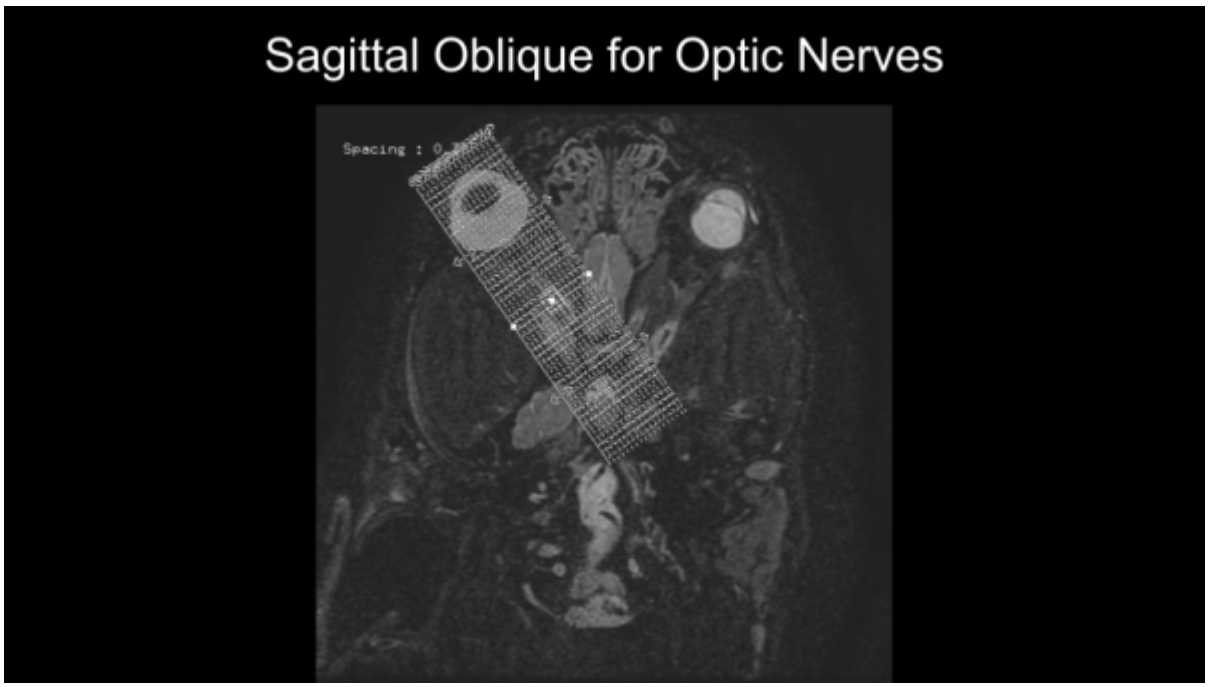
See GIFs below to get a sense of the anatomy. Sequence: 3D Isotropic PD FRFSE

Dorsal Oblique

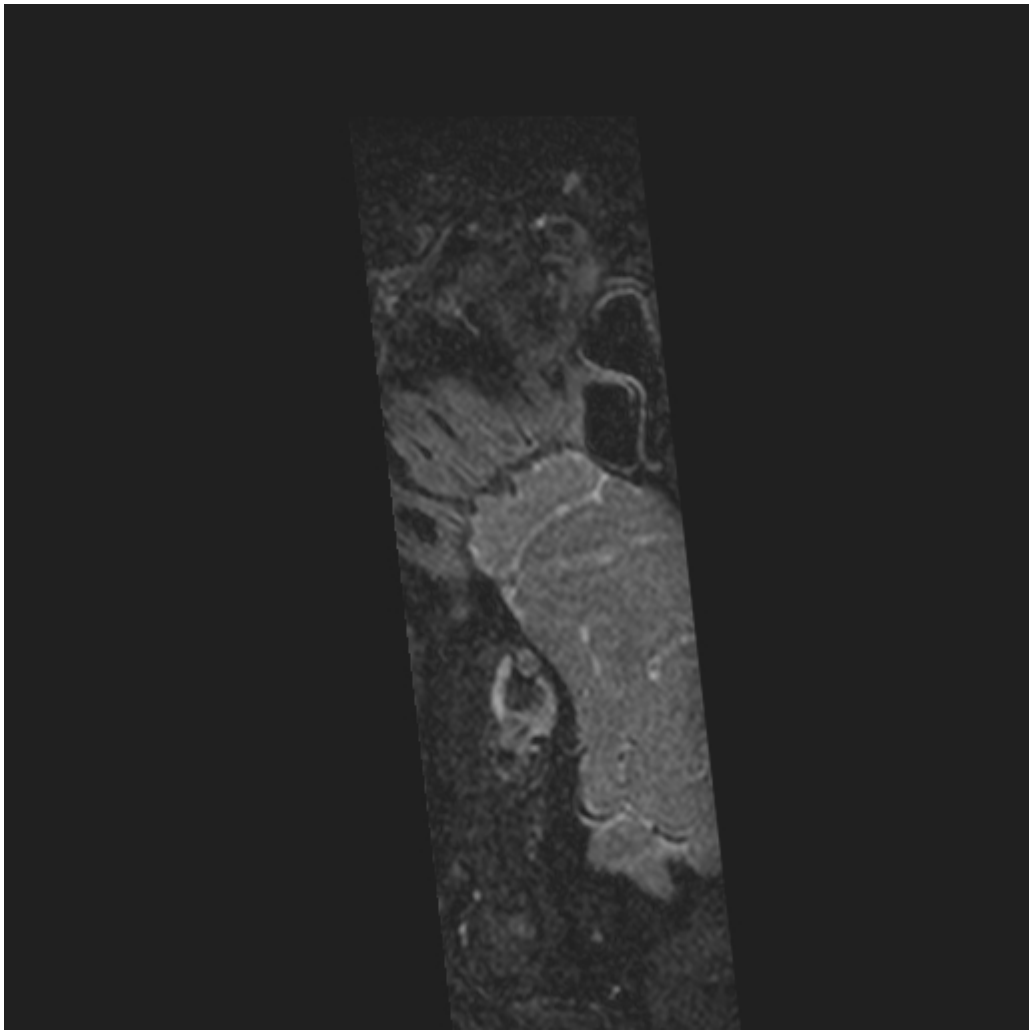


****Sagittal Oblique**:**

The Sagittal Oblique is fairly straightforward. While looking at a dorsal image, plan about a 30 degree oblique from straight sagittal and expand slice coverage to include the entire orbit.



Sagittal Oblique Reformat 3D PD FRFSE



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