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ANATOMICAL BASIS OF MANIFESTATIONS OF CAVERNOUS SINUS SYNDROME

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The cavernous sinus is a paired Dural venous sinus located in the base of the skull, within the middle cranial fossa on the sides of the sella turcica. In spite of its small size, pathological processes involving the cavernous sinus, can cause multiple serious clinical symptoms. This is due to anatomical relationship of the cavernous sinus with various structures, such as internal carotid artery, pituitary gland, veins, and cranial nerves.

The cavernous sinus consists of venous caverns and a plexus of various sized veins that incompletely surrounds intracavernous segment of the internal carotid artery. The cavernous sinus drains venous blood from the orbit, meninges, and hypophysis, interconnects with the deep facial veins through the emissary veins, passing in the openings of the skull base. Numerous dural sinuses, such as the sphenoparietal, intercavernous, basilar, superior and inferior petrosal sinuses, converge in the sinus.

The walls of the cavernous sinus – lateral, medial, superior, and posterior, are lined with Dura mater. The oculomotor nerve (CN III), the trochlear nerve (CN IV), the ophthalmic and maxillary divisions of the trigeminal nerve (CN V) pass in the lateral wall, most of them further course to the orbit through the superior orbital fissure. On the contrary, the abducens nerve (CN VI) runs through the cavity of the cavernous sinus and is the most susceptible to the compression. These nerves are responsible for movements of the eyes and facial skin sensation. The oculomotor nerve additionally contains parasympathetic fibers regulating the pupil size and accommodation of the lens. Besides, the sympathetic nerves arising in the superior cervical ganglion surround the internal carotid artery within the sinus.

Pathology involving the cavernous sinus, generally are referred to as cavernous sinus syndrome. Clinical manifestations of cavernous sinus syndrome are highly variable and closely related to the associated nerves and vascular structures. Diseases affecting the cavernous sinus include neoplasms, infections, and non-infectious inflammatory disorders, vascular disorders, e.g. cavernous sinus thrombosis, cavernous sinus fistulas, and aneurysms. They could be hazardous as they may cause obtrusions and compressions of cranial nerves and arteries, disrupting their function.

Precise understanding of the cavernous sinus, its regional anatomical structures and their correlation to clinical signs are necessary for medical practitioners for diagnosis of related pathologies, as well as serves the groundwork for surgical intervention.