

Lateral Sphenoid Sinus □ **Anatomical Overview** The sphenoid sinus is a midline paranasal sinus located in the body of the sphenoid bone. Its lateral extension, when present, can pneumatize into adjacent structures, creating anatomical variations with significant surgical implications.

► Lateral pneumatization may extend into: The greater wing of the sphenoid

The pterygoid process

The opticocarotid recess

The foramen rotundum and vidian canal (making them visible within the sinus cavity)

This lateral expansion is classified in radiological anatomy as part of the sphenoid sinus types:

Conchal

Presellar

Sellar

Postsellar

Lateral recess (variant with lateral pneumatization)

□ **Radiological Features** On CT scan, the lateral recess is identified as a lateral extension of the sinus cavity beyond a line drawn from the medial pterygoid plate to the foramen rotundum.

On MRI, it can help define tumor or infection spread into lateral skull base compartments.

□ **Clinical and Surgical Significance** The lateral sphenoid sinus is a key region in skull base and endoscopic surgery. Its importance lies in its proximity to critical neurovascular structures, including:

Internal carotid artery (ICA)

Optic nerve

Maxillary nerve (V2) via foramen rotundum

Vidian nerve in its canal

Cavernous sinus

Meckel's cave

Lateral recess of the sphenoid sinus → potential corridor for extended endonasal approaches

► **Surgical Approaches Involving the Lateral Sphenoid Sinus:** Transpterygoid endonasal approaches

Extended transsphenoidal approaches

Endoscopic approaches to Meckel's cave or lateral cavernous sinus

□ **Associated Pathologies** Invasive pituitary macroadenomas with lateral extension

Meningiomas of the medial sphenoid wing or cavernous sinus

Chordomas or chondrosarcomas

Juvenile nasopharyngeal angiofibroma (extension into the lateral sphenoid sinus or pterygoid base)

Mucocele or fungal sinusitis with erosion into orbit or skull base

Trauma or CSF leaks (iatrogenic or spontaneous)

□ Key Points for Residents Always assess degree of lateral pneumatization preoperatively using CT.

The lateral recess provides a potential surgical corridor, but also increases the risk of ICA injury.

Endonasal approaches to this area require expertise in navigation and anatomy, especially when using the transpterygoid route.

The foramen rotundum and vidian canal may be visible inside a highly pneumatized sinus — key for orientation and avoiding nerve damage.

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