

# Lateral opticocarotid recess

The **lateral opticocarotid recess (LOCR)** is an important **anatomical landmark** located at the **skull base**, specifically within the **sphenoid sinus**. It lies between two critical structures: the **optic nerve** (laterally) and the **internal carotid artery** (medially), hence the name “opticocarotid.”

## Key Points

- **Location:** In the lateral wall of the sphenoid sinus.
- **Boundaries:**
  1. Medially: Internal carotid artery (paraclival segment).
  2. Laterally: Optic nerve (intra canalicular or intracranial segment).
- **Clinical significance:**
  1. Acts as a key surgical landmark in **endonasal endoscopic skull base surgery**, particularly for:
    1. Transsphenoidal approaches to the **parasellar** and **suprasellar** regions.
    1. Approaches to the **cavernous sinus** and **optic canal**.
  1. Helps identify the **optic strut**, a bony structure separating the optic canal from the superior orbital fissure.
  1. Understanding its position is critical to avoid damage to the optic nerve or carotid artery during surgery.

## Descriptive anatomical studies using imaging and surgical correlation

A study investigates the anatomical relationship between the lateral opticocarotid recess (LOCR) and the **accessory sphenoidal septum (ASS)** using three-dimensional reconstructed imaging anatomy to identify ASS ridge as a reliable landmark in locating indistinct LOCR during transsphenoidal surgery.

Guo et al. selected 132 patients who underwent head CT and MRA scanning in our hospital between 2020 and 2022. Depending on their raw image data, we reconstructed the sphenoid sinus and simulated transsphenoidal approach view on three-dimensional reconstructed images. The anatomical relations between the LOCR and ASS ridge were observed and analyzed on the right and left sides. Then, we accurately located LOCR by the intersection between the ASS ridge or its prolongation line and the junction of the roof and outer wall of sphenoid sinus in locating the indistinct LOCR during 104 virtual and 22 actual endoscopic transsphenoidal operations.

On 264 sides of the three-dimensional reconstructed sphenoid sinus of 132 patients, LOCR was indistinguishable on 171 sides; among them, 104 sides with the presence of ASS on the same side. On

99 sides, the indistinct LOCR at the intersection of the ASS ridge or its prolongation line with the junction of the roof and outer wall of sphenoid sinus. In 22 actual operations, locations of all indistinct LOCRs by the ipsilateral ASS were consistent with them by neuronavigation.

LOCr has an intimate relationship with ipsilateral ASS, which helps in locating indistinct LOCr by ASS ridge or its prolongation line during the transsphenoidal sinus approach <sup>1)</sup>.

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Guo et al. present an intriguing and potentially useful anatomical relationship that could aid in navigating complex transsphenoidal surgeries. However, more rigorous validation—preferably multi-center and involving larger cohorts of real surgical cases—is needed before widespread adoption. Future studies could incorporate intraoperative imaging, outcomes analysis, and training assessment for junior surgeons using this anatomical cue.

<sup>1)</sup>

Guo Q, Qiu T, Kong T, Yin M, Wang G, Ma S, Tao S, Liu Z. Three-dimensional imaging anatomical study of the lateral opticocarotid recess and the accessory sphenoidal septum. *Surg Radiol Anat.* 2025 Apr 2;47(1):110. doi: 10.1007/s00276-025-03618-8. PMID: 40175593.

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