

## Oncological Aspect in Rhinology

Tumors affecting the nose, paranasal sinuses and adjacent skull base are incidentally rare, accounting for less than 1% of all tumors. These tumors can be benign or malignant and vary greatly in site, size, type and nature. However, they pose significant management problems due to their late presentation and juxtaposition to important anatomical structures, such as eye and brain. The increasing application of endonasal endoscopic techniques to their excision offers potentially similar scales of resection but with reduced morbidity.



The sinonasal and skull base region have the greatest histological diversity in the body.

Benign tumors of the sinonasal tract can be divided into several groups; fibro-osseous (osteoma, chondroma, ossifying fibroma, and fibrous dysplasia), neural-related (schwannoma, neurofibroma and meningioma), hamartomatous (respiratory epithelial adenomatoid hamartoma), odontogenic (ameloblastoma, and calcifying epithelial tumor of Pindborg), vascular (hemangioma, hemangiopericytoma, juvenile nasopharyngeal angiofibroma, and pyogenic granuloma), and inverted papilloma.

The World Health Organization has classified the malignancies of the nose and paranasal sinuses based on the type of tissue, with more than 25 specific types listed. Malignant lesions may include squamous cell carcinoma, adenocarcinoma, adenoid cystic carcinoma, mucoepidermoid carcinoma, esthesioneuroblastoma, melanoma, lymphoma and metastatic lesions from other body sites. More than 50% of sinonasal metastases take origin from a renal carcinoma. Other most common primary sources in decreasing order after the renal involvement are lung (12%), urogenital ridge (12%), breast (9%) and gastrointestinal tract (6%). The most common metastatic sites are the maxillary sinus (50%), followed by the ethmoid sinus (18%) and nasal cavity (15%).

Tumors of the anterior skull base may be benign or malignant olfactory groove meningioma typically present as an extra-axial, durally-based lesion involving the anterior skull base, such as, osteoma, schwannoma, neurofibroma, esthesioneuroblastoma.

Chordomas and chondrosarcomas are the most frequently encountered clival lesions.

Lesions in the petrous apex area include: chordomas, chondrosarcomas, and extension of petroclival meningiomas and nasopharyngeal carcinomas. Among benign lesions, the most frequently encountered is cholesterol granuloma. Assessment of the relationship with internal carotid artery is critical to select the proper corridor of endoscopic access.

A series of different lesions can be observed in the area of planum, tuberculum and sella, such as, meningiomas, craniopharyngiomas, and pituitary adenomas. Understanding the relationship of the lesion with the pituitary stalk, optic chiasm, internal carotid artery, cavernous sinus, middle and anterior cerebral arteries is crucial for establishing the feasibility of an endoscopic approach.

Tumors affecting the sinonasal region and the skull base are diagnosed on the basis of various signs and symptoms, imaging studies which include computed tomography and magnetic resonance imaging and histopathology.

However, CT is the first investigation commonly obtained in a patient with symptoms suggesting a disease involving the sinonasal tract and/or the adjacent skull base. Computed tomography can properly define the nature of the lesion and its borders, the other lesions require an MRI with gadolinium enhancement. The key issues in imaging patients with a malignant tumor of the sinonasal tract are mapping of anterior skull base and orbit involvement, and assessment of perineural spread. All these goals are better achieved by MRI than with CT.

Treatment may involve evaluation by several medical specialities including otolaryngology, radiation oncology, neurosurgery and medical oncology. The treatment decisions are based on the type of lesion, its location and extent and overall health of the patient. The decision to use as open *vs* endoscopic approach is individualized based on a patient's needs. Increasingly, endoscopic approaches are being used when possible.

The evolution of surgical techniques has created another surgical option in the form of endonasal endoscopic surgery. During the past two decades, endoscopic endonasal surgery to the sinonasal region and skull base are become a feasible and increasingly popular option for the treatment of lesions in this area. The procedure can provide access to anterior, middle and posterior cranial fossa.

A review of the literature shows that endoscopic removal of these lesions gives as good, if not better, results when compared to external approaches. The advantage of the endoscopic technique is the absence of facial incision, negligible facial swelling, a shorter hospital stay and a reduction in postoperative pain and dysesthesia.

Extrasellar pituitary adenomas with suprasellar extension, meningiomas and select craniopharyngiomas require a combined trans-sellar/transplanum approach with removal of the tuberculum. This allows one stage removal of the entire tumor with direct visualization. Common indications for the transcribiform approach include the repair of CSF leaks, encephaloceles/meningoceles, access to benign intracranial tumors, such as olfactory groove meningiomas, resection of sinonasal malignancies with skull base invasion, such as olfactory neuroblastomas. Transclival approach can be used to access meningiomas, chordomas and chondrosarcomas which are the most common lesions involving the clivus and it can also be used to remove highly selected vertebrobasilar aneurysms that are not amenable to endovascular treatment.

Regardless of the surgical technique, the aim should be to adhere to the oncological principles with intent to cure. The goals of surgery must include complete excision of tumor with clear margins and preservation of critical surrounding structures with maintenance of nasal formation.

The importance of a multidisciplinary approach and need for long-term follow-up can never be denied. The special issue has been published to emphasize the role of endoscopes and their superiority over open approaches in anterior and middle skull base region.

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