



RADIOLOGICAL AND INTRAOPERATIVE CORRELATION IN ANTERIOR ETHMOIDAL NERVE SCHWANNOMA

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SUMMARY :

Sino-nasal Schwannomas account for only 4% of all head and neck schwannomas. Diagnosis is mainly histological. So far, only septal schwannomas have often been reported. The other sub-sites, apart from the nasal septum, are extremely rare and have not been found to the best of our knowledge. Here we present a middle-aged patient with sinonasal schwannoma from the anterior ethmoid nerve. We give the tumor's intricate radiological and intraoperative details, which helps in complete removal, thereby avoiding recurrence.

BACKGROUND :

Nasal schwannomas that arise apart from the nasal septum are rare⁽¹⁾. Although benign and slow growing, if they emerge from the proximity to the skull base, like in this case, they can cause rarefaction of the bone and intracranial extension. We present such a case with its origin from the anterior ethmoidal nerve causing rarefaction of the anterior cranial base and its radiological and intraoperative details.

CASE PRESENTATION :

A middle-aged patient reported to our tertiary care otolaryngology unit complaining of left eye watering and proptosis for two years. The patient underwent some endoscopic surgery for above complaints elsewhere eight months back. The details were unavailable to the patient when the patient came to us. The patient underwent an endoscopic biopsy elsewhere a few days back. As the histopathology of the biopsy revealed schwannoma, the patient was referred to our institute.

INVESTIGATIONS :

We performed a computerized tomography of the nose and paranasal sinuses and a contrast-enhanced MRI to look for both bony and soft tissue details. The imaging revealed a T1 isointense and T2 hyperintense well-defined tumor involving the entire nasal space and anterior and posterior ethmoids. The anterior cranial base was rarefied. However, there was no intracranial extension (figure 1). We found that the tumor capsule at the region of the anterior ethmoidal neurovascular bundle was thick compared to other areas (figure 2). On histopathology, the tumor was composed of organized compact cellular stroma with wavy nuclei. Immunohistochemistry with S-100 showed nuclear positivity in the spindle cells. (figure 3).

DIFFERENTIAL DIAGNOSIS: not applicable

TREATMENT :

After obtaining informed written consent and a pre anaesthetic evaluation, we electively operated on the patient. Under General anaesthesia, first, we delineated the tumor all around. We found the tumor is accessible all around except the superior aspect. After obtaining sufficient tissue for histopathological examination, we removed the tumor in a piecemeal manner using the four-hands technique as the tumor was moderately vascular. We found the origin of the tumor from the anterior ethmoidal neurovascular bundle near the cribriform plate (figure 4). We also found the exposed dura near the lateral lamella of the cribriform plate. We precisely cauterized the tumor capsule and removed it without injuring the exposed dura. We used angled bipolar cautery to obtain hemostasis from the skull base and neurovascular pedicle. Postoperatively patient's vision and sensorium were normal. Patient was discharged on the second postoperative day after removing the nasal pack.

OUTCOME AND FOLLOW-UP :

The patient was followed up for four months and is still on follow-up. She was comfortable and without any complaints and olfactory disturbances in the follow-up. As the check endoscopies were unremarkable till the last follow-up, we did not do any follow-up imaging.

DISCUSSION :

Schwannoma or neurilemmoma is a slow-growing benign neoplasm that arises from the neuroectodermal Schwann cells of the cranial, peripheral, or autonomic sheaths ^(2,3). Common symptoms of sino-nasal schwannomas include unilateral nasal obstruction, epistaxis, and headache can present with proptosis, blurred vision and cheek swelling. The symptoms remain the same irrespective of the site of origin in the sinonasal tract ⁽³⁾.

Radiologically, the tumour appears well-defined, round, tubular or partially lobulated soft tissue masses that can be iso to hypointense on T1W and iso to hyperintense in T2W MRI imaging ⁽⁴⁾. In largely grown tumors, there was no sign that is suggestive of the origin of the tumor from radiology. In our case, we found that the tumor capsule in T1W MRI was thicker at its origin at the skull base than in other areas.

Many surgical approaches have been proposed in the past ^(5,6); however, the gold standard approach for sino-nasal schwannoma is endoscopic surgical excision. Complete tumor excision is required to avoid recurrences, as in our case. In large schwannomas, as the origin is not discernible, there is a chance of leaving some residual tumor at its origin, leading to recurrence. However, a thorough evaluation of the preoperative imaging and precise intraoperative correlation of the findings can hint at the probable site of origin. The tumor arose from the anterior ethmoidal neurovascular bundle with significant skull base erosion in the present case. However, there was no intracranial extension. As we have appreciated the tumor origin, we have removed it entirely from the skull base with the help of angled bipolar and coblation techniques. The tumor volume was significant in our case; we removed the tumor in a piece-meal fashion. Other workers also suggested piece-meal excision as a safe and effective option for sino-nasal schwannomas⁽⁷⁾.

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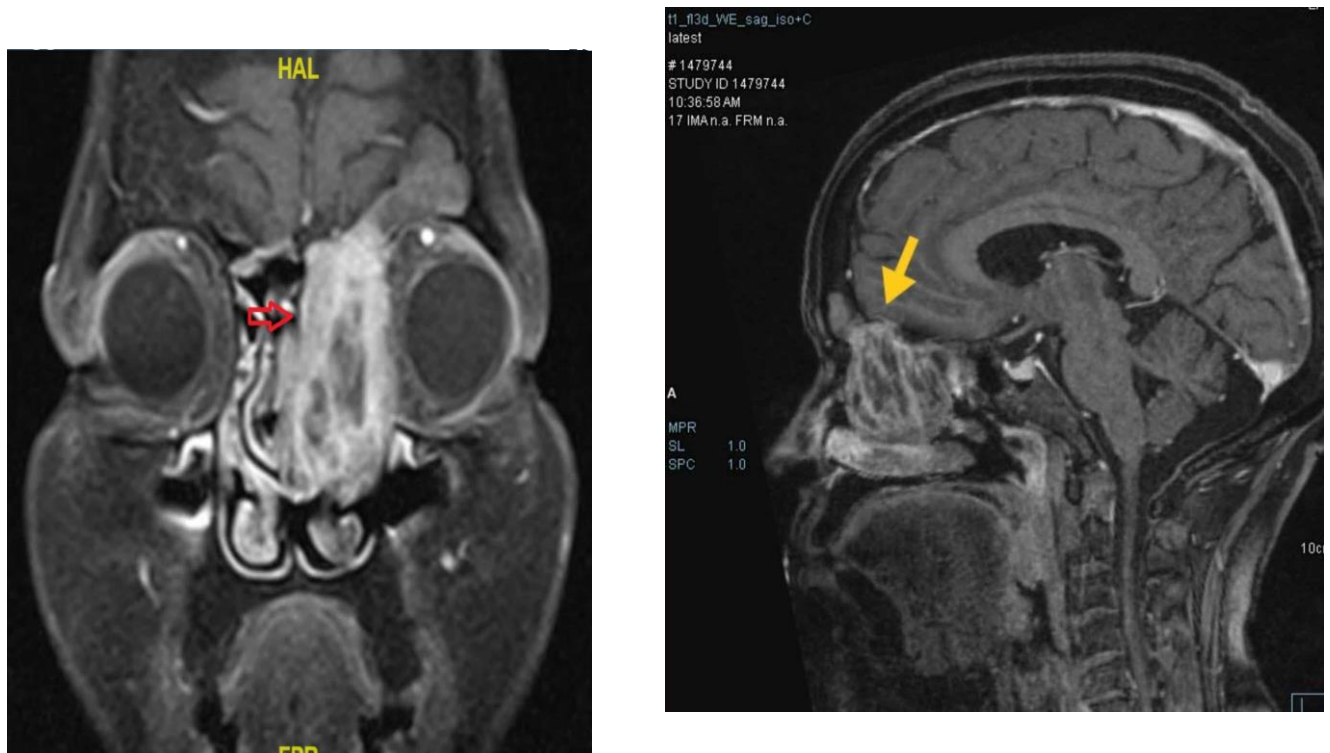


Figure 1a, 1b - CT and MRI T1W (coronal view) imaging showed erosion of the anterior skull base

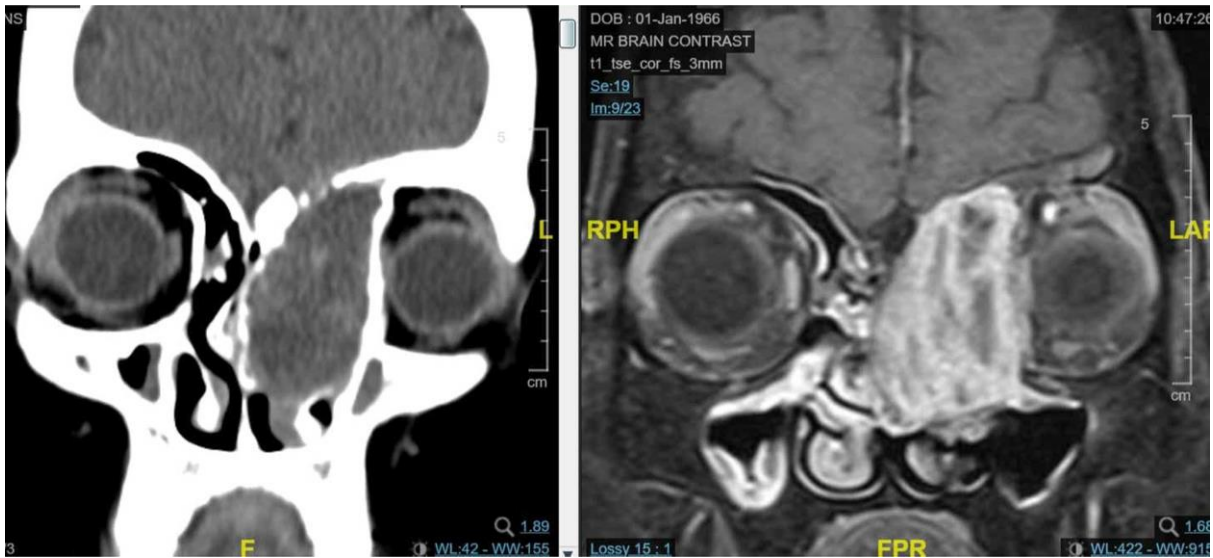


Figure 2a, 2b - MRI T1W (coronal and sagittal) imaging showed thick tumor capsule at anterior ethmoidal neurovascular bundle suggesting origin of the tumor with no obvious intracranial extension

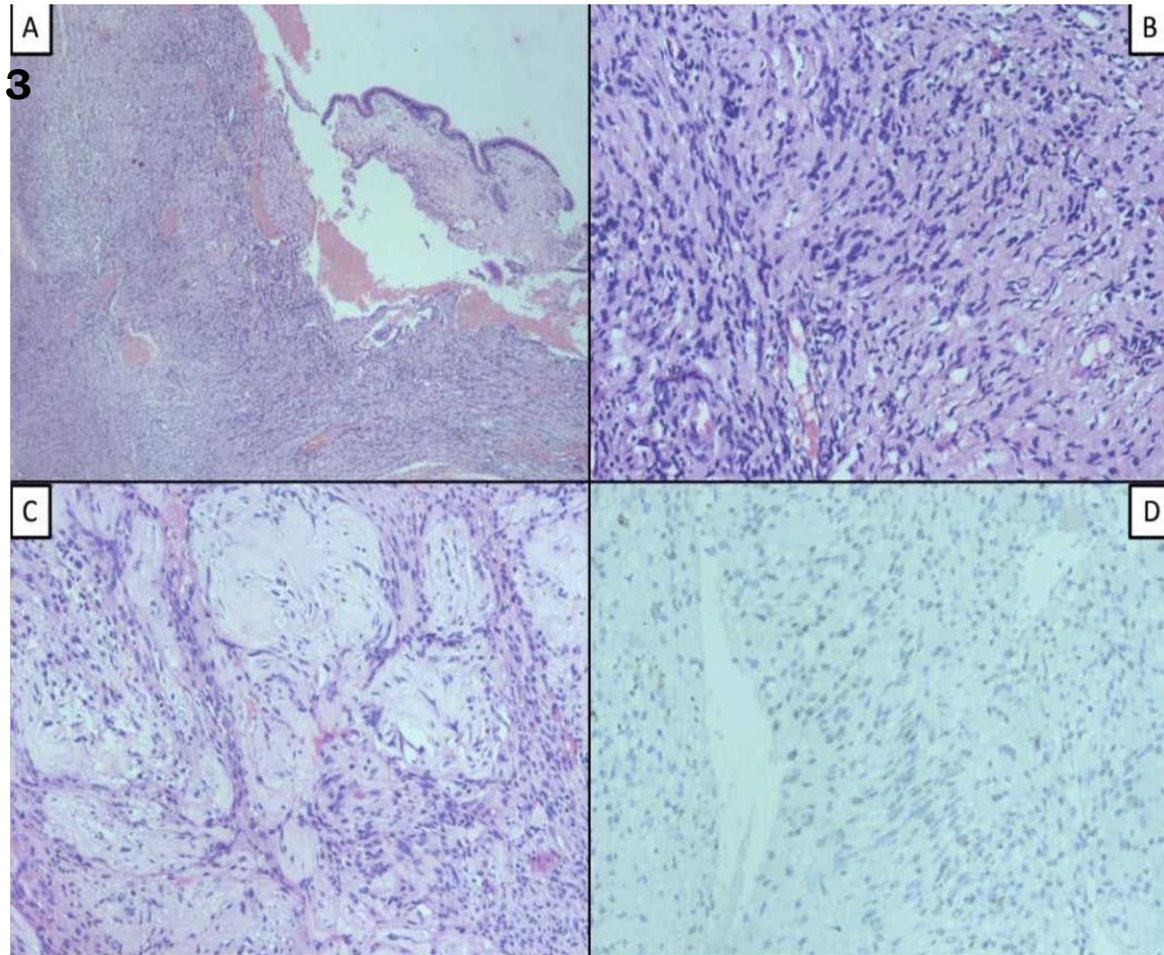


Figure 3 - Photomicrographs of nasal tumor show: A - respiratory mucosa with underlying cellular stroma (H&EX40); B - Hypercellular shows bland spindle cells with wavy nuclei (H&E, x200); C - Hypocellular areas show hyalinised vessels (H&E x200), D - Immunohistochemistry with S 100 show nuclear positivity in spindle cells (DABX200).

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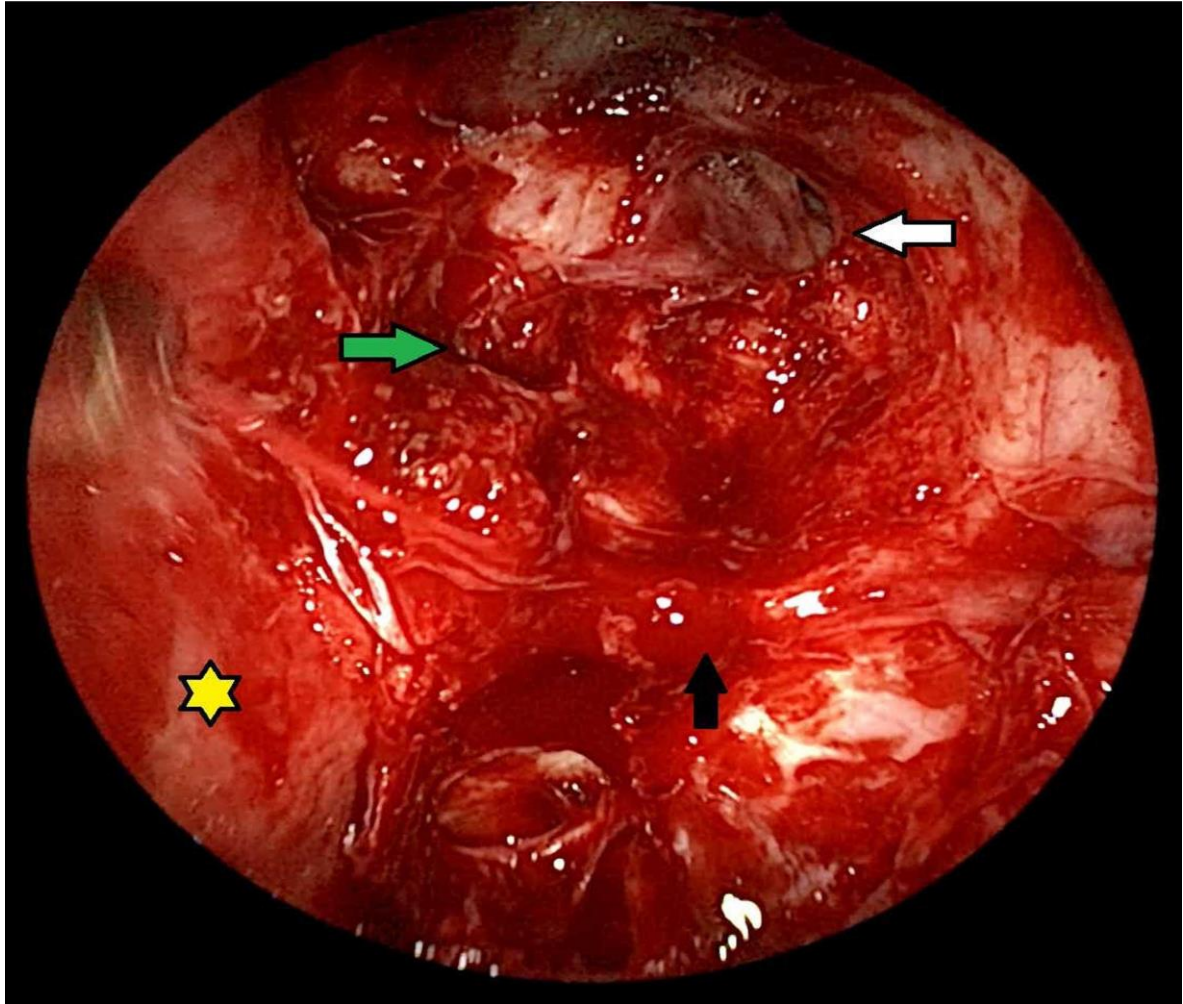


Figure 4 - Intraoperative endoscopic picture after completion of tumor removal depicting frontal sinus opening (white arrow), skull base erosion with exposed dura (green arrow), anterior ethmoidal neurovascular bundle (black arrow), septum (yellow star)

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