



International Journal of Rhinology & Otolaryngology

Case Report

Endoscopic Management of a Rare Presentations of Paranasal Sinus Osteomas - ②

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Submitted: 25 July 2020; Approved: 28 July 2020; Published: 29 July 2020

Cite this article: Yassir H, Zouhair N, Mallouk S, Oukessou Y, Abada RA, et al. Using a Custom Made Titanium Sheet to Reconstruct a Collapsed Nasal Valve. Int J Rhinol Otolological. 2020;3(1): 008-014.

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ABSTRACT

Nasosinusal osteoma is a slow-growing, benign bone tumour. It can remain asymptomatic for a long time before causing deformation or compression of adjacent structures.

Complications such as chronic sinusitis and mucocoeles may occur with potential intraorbital or intracranial complications.

we present here complicated, rare and unusual forms of paranasal sinus osteoma. Data concerning demographic information, clinical presentation, radiographic findings, localization of the lesion, and surgical approaches were collected and presented.

The aims of our study were to describe the unusual cases in our institution and to set out our management endonasal endoscopic in the treatment of nasosinusal osteomas

The development of endoscopic naso-sinusal instrumentation and surgical navigational systems has emphasized endoscopic endonasal procedure indications in naso-sinusal osteoma management

The endoscopic drill cavitation technique by exclusively endoscopic endonasal approach allow the surgeon for a better intraoperative control making removal of sinus osteomas safer and lowering the complications and the morbidity.

Keywords: Osteoma; Endonasal; Endoscopic; Surgery; Paranasal

INTRODUCTION

Osteoma is the most common cancer of the paranasal sinuses, with an incidence rate of 0.014–0.43%. The location in the frontal sinus represent nearly 80% of all cases [1,2].

An osteoma of the paranasal sinus is usually asymptomatic. Headache, proptosis, epiphora, diplopia, decreases in vision, facial deformity, face pain are possible symptoms [3].

Complications such as chronic sinusitis and mucocoeles may occur with potential intraorbital or intracranial complication [3].

The management of sinus osteoma is still a subject of controversy. In recent years, the indications for the type of surgical approach in relation to size and localization of the lesion have changed.

Endonasal endoscopic, aided or not by navigational systems surgery with development of specific instrumentation. Could provide a safe and effective alternative to open approaches and allows enlarging the indication field of endoscopic approach, with enabling closer and more direct visualization of the anatomy as well as avoiding damage to the surrounding structures [4,5].

CASE REPORT

Case 1 : Ethmoidal osteoma complicated by cerebrospinal fluid rhinorrhea

A 23 year old man with no relevant medical or family history, was referred to our department due to recurrent meningitis. The patient reported the initiation of watery nasal discharge. getting worse when patient lean over or change position in bed. and he exhibited neck stiffness; with chronic headache with right nasal obstruction, and no other associated symptoms were observed.

After confirmation the meningitis by lumbar puncture, the patient was administered antibiotic and the investigation has ben completed.

A sinus CAT scan revealed a 31*27*17mm lesion of osseous density, located in the anterior ethmoide extending to the posterior ethmoid air cells sinus with erosion the left lamina papyracea and dehiscence along the right cribriform (black arrow) with soft tissue opacification of the olfactory cleft suggesting a meningocele (Figure 1).

Brain Gd-enhanced T2-weighted Magnetic Resonance

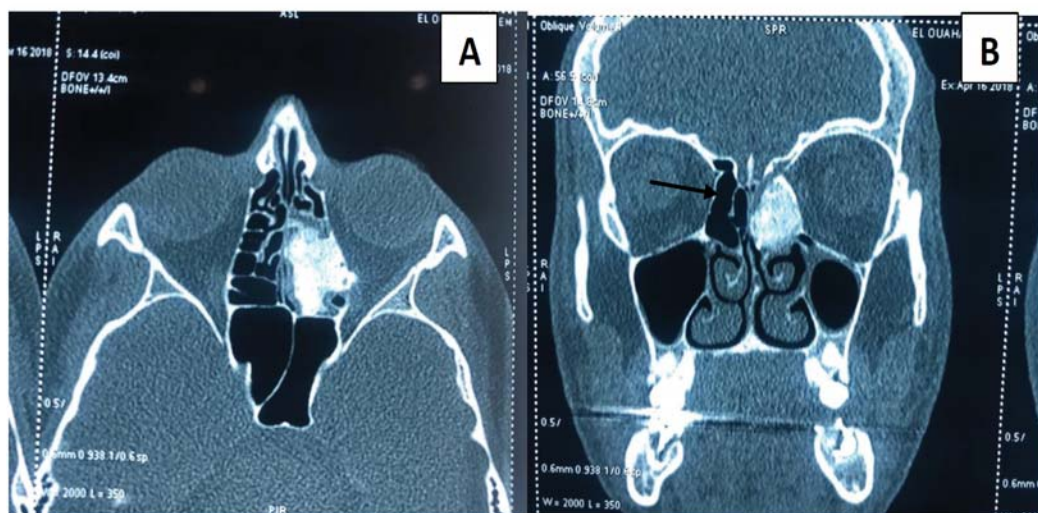


Figure 1: A and B axial and coronal plan computed tomography scan show a bony mass in the a computed tomography scan show a bony mass in the left ethmoid sinus extending into skull base with dehiscence along the right cribriform (black arrow).

Imaging (MRI) revealed a leakage at cribriform plate with cerebral ventriculomegaly (Figure 2).

General anesthesia is induced and topical decongestion of the nose is performed with cottonoids soaked in XYLOCAINE NAPHAZOLINE 5 %.

Endonasal endoscopic sinus surgery was performed for the removal of the osteoma. Uncinectomy was performed, maxillary sinus ostium was identified. After the anterior wall of the ethmoid bulla had been resected, the osteoma was fairly visualized as a hard and white mass (Figure 3).

The middle turbinate has been resected. It was necessary to drilled the osteoma with the help of a burr from the centre to the periphery and the rest removed by blakysley.

After removal of large osteoma a total ethmoidectomy has been completed, the bony defect has ben identified in the lamina criblé with the CSF leak. The base of the meningocele has been cauterized at the skull base. folowed by closure the defect with fat and fascia lata,placed as an onlay over the defect (Figure 4) with the edges of the graft exceeding the bony defect circumferentially.

Case 2 : Sphenothmoidal osteoma with maxillar, nasal and orbital extension compressing the optic nerve

A 33-year-old woman with no relevant medical or family history, who has presented right nasal obstruction, periorbital headache , exophtalmos evolving for 24 months with a decrease in vision for 1 year, Visual acuity was 06/10 in the right eye and 10/10 in the left eye

Nasal examination revealed a hard bony mass in the right nasal cavity that extended into the middle meatus.

Coronal CT scanning showed an extremely dense well-circumscribed lesion located in the right ethmoid sinus and extending the sphenoid and maxillary sinus and nasal wall .There was an extension to the skull base without invasion, and the orbital cavity with compressing the optic nerve (Figure 5).

The patient was admitted and scheduled for endonasal endoscopic



Figure 3: Per-operativ endoscopic view of the osteoma.

resection of the osteoma. The operation started with resecting the anterior ethmoid air cells and removing the ground lamella. A white osteoma in the maxillar sinus and posterior ethmoid air cells, extending back to and involving the face of the sphenoid sinus, could be clearly seen.

The endoscopic drill cavitation technique was performed to drill out the core of the lesion, all the way to the front anterior wall of the sphenoid sinus, followed by sphenoidotomy (Figure 6). A diamond drill was used to gently resect the most superior and lateral regions of the osteoma in the sphenoid sinus.

The lesion was totally resected, outside from the optic nerve, without damaging the nearby structures. The follow up has been marked by a slight regression of the exophthalmos and satationary visual acuity.

Case 3 : Large ethmoido-orbital osteoma

A 43-year-old man who had been deaf and mute since childhood, his clinical presentation was characterized by chronic headache with right nasal obstruction and no other associated symptoms, particularly ophtalmological.

The endoscopic examination of nasal cavity and the ophthalmologic examination was normal.

Sinus CT scan showed the presence of a large bone mass in the left anterior ethmoid sinus, hyperdense, well-limited, measuring 30mm * 30mm, with endo-orbital extension through the right lamina papycea without endocranial extension (Figure 7).

Under general anaesthesia, endoscopic sinus surgery was performed for the removal of the mass. Uncinectomy was performed, maxillary sinus ostium was identified to determine the plane of the lamina. After the anterior wall of the ethmoid bulla had been resected, the osteoma was fairly visualized as a hard, whitish mass strongly bonded to the medial wall of the orbit. It was necessary to drilled the lesion with the help of a burr from the centre to the periphery and the rest removed by blakysley (Figure 8). The anterior ethmoidal artery was free of disease.

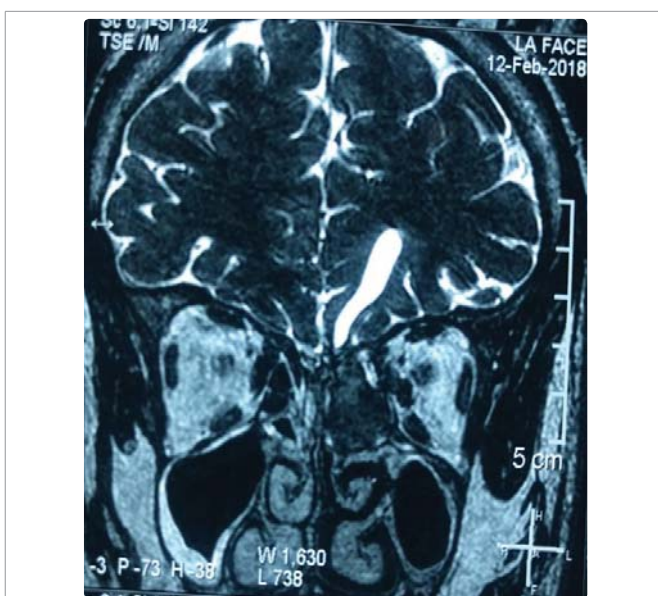


Figure 2: Preoperative coronal (A) T2-weighted magnetic resonance images show a leakage at cribriform plate with cerebral ventriculomegaly.

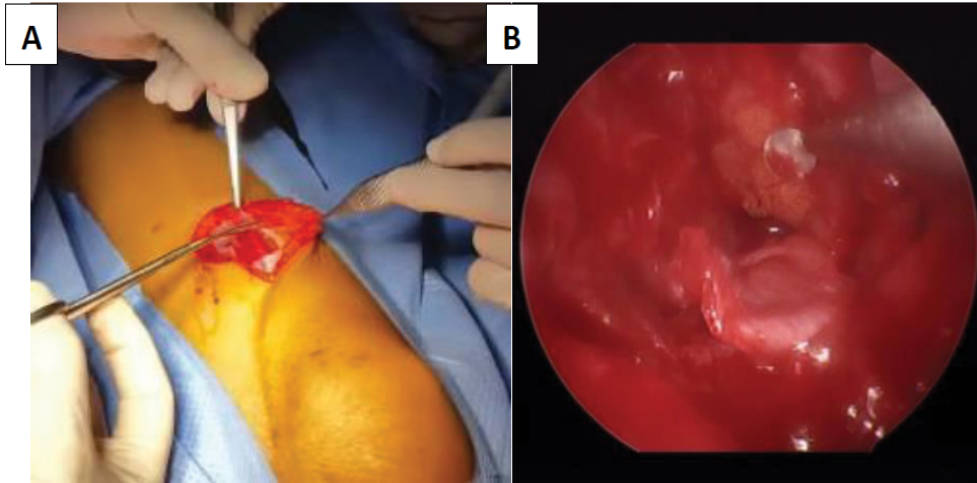


Figure 4: (A) Per-operative endoscopic view showing extraction of the fat and fascia lata in the right thigh (B) Endoscopic peroperative view showing a defect in the cribriform plate with an arrow pointing to the fascia lata and fat graft.

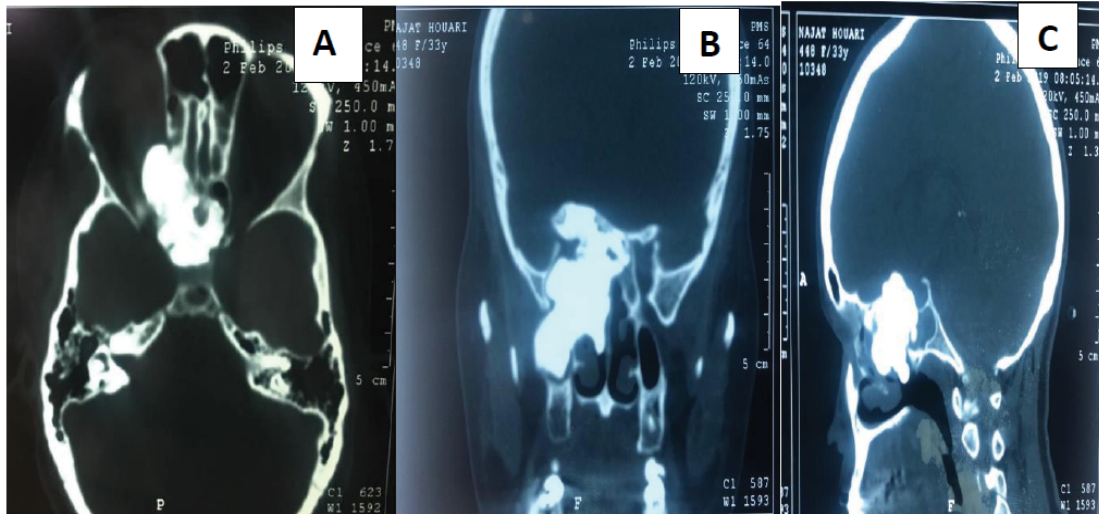


Figure 5: (A) Axial view showing a bony mass with lateral displacement of the right orbital contents (B) Coronal view demonstrating involvement of nearly the entire right nasal cavity (C) Sagittal view showing the endocranial extension.

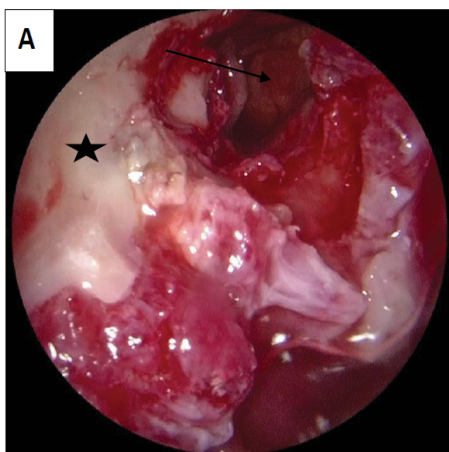


Figure 6: Endoscopic peroperative view showing the drilled osteoma in the lateral wall (star) and the sphenoidotomy (black arrow).

Case 4 : Frontoethmoidal osteoma with orbital extension

An 18-year-old male was referred to our institution, with no relevant medical or family history, who has presented right exophthalmos, intermittent frontal headaches and decreased vision in the right eye evolving for 24 months .

His eye examination revealed the right diplopia, limited eye movement and Visual acuity was 09/10 OD.

During our clinical examination, we noted minimal septal deviation to the right and hypertrophy of the lower left turbinate.

CT scan of the sinuses showed a well-limited, polylobate hyperdense, right fronto-ethmoidal process, measuring 45*35mm, with endo-orbital extension through the lamina papyracea resulting in displacement of the eyeball and the internal oculomotor muscle. Without erosion the anterior frontal sinus wal (Figure 9).

Surgery was performed under general anesthesia, using a 0° and 45° nasal endoscope, and after installation of the neuronavigation

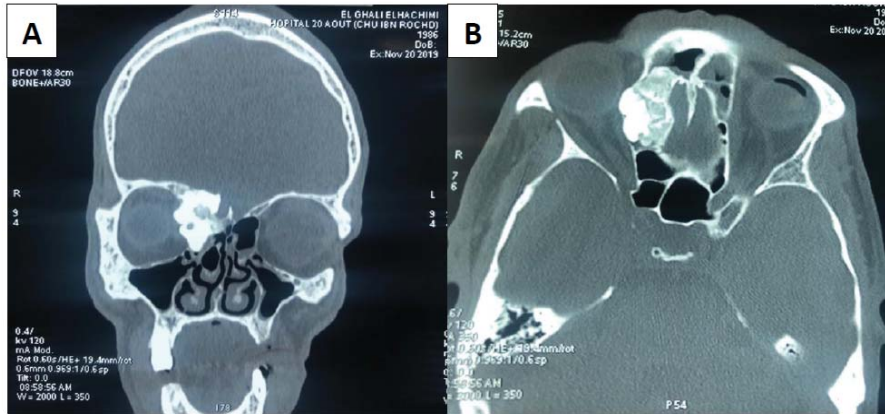


Figure 7: Preoperative CT coronal and axial view (figure A and B) of osteoma located in ethmoid cells with extension to the orbit.

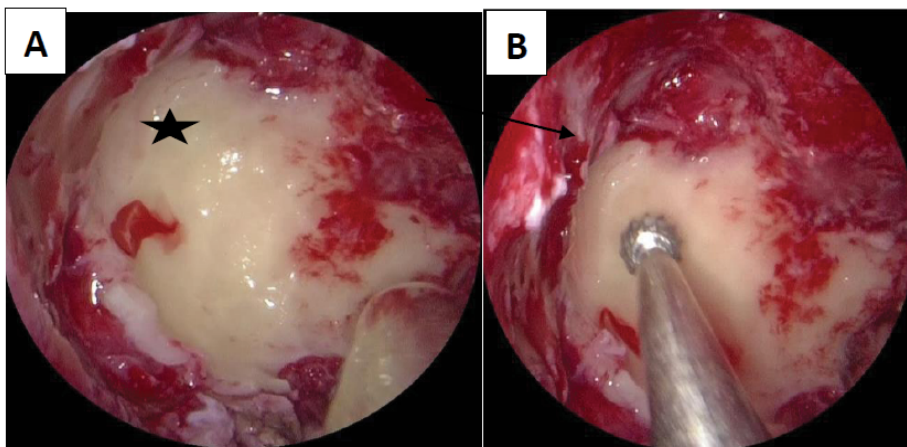


Figure 8: Endoscopic peroperative view show the drilled osteoma (star arrow) along the medial wall of the orbit (black arrow) without invasion of the peri orbite.



Figure 9: Preoperative CT, (figure A); sagittal view demonstrating ethmoidal extension of a frontal osteoma. Coronal view (figure B) osteoma strongly attached to the medial orbital wall.

system the surgical procedure was started by a septoplasty to expand the surgical field. Uncinectomy with large maxillary meotomy was performed and right anterior and then posterior ethmoidectomy was performed, with drilling of the lesion with help of a burr from the centre to the periphery of the lesion to the frontal sinus (Figure 10). The follow up has been marked by the complete regression of the diplopia.

DISCUSSION

Nasosinusal osteoma is a benign bone tumor that develops slowly and asymptotically. It tends to be an incidental finding on radiographic studies. Routine CT scans are said to reveal approximately 1% of osteoma [6].

Clinical presentation, when existing, is caused by tumor size

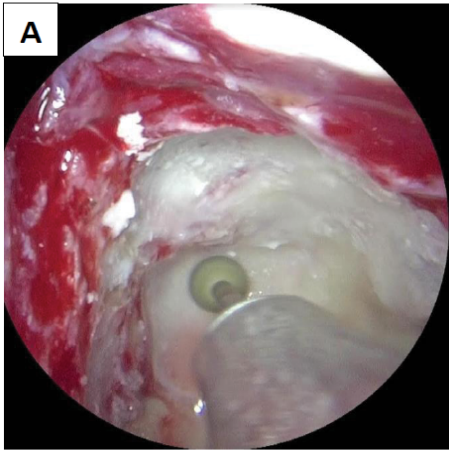


Figure 10: Endoscopic peroperative view showing the fronto-ethmoidal osteoma drilling with a diamond burr.

and its location. Indeed, the osteoma may result in blockage of sinus ostia. Problems such as chronic sinusitis and mucocele formation may arise. Moreover, Exophthalmos, decreases in vision, proptosis and diplopia can be evident after the growth of the lesion toward the orbit through the lamina papyracea [7,8].

The intracranial extension of the lesion can be responsible for different complications such as cerebral abscess, pneumocephalus, meningitis, and cerebrospinal fluid leak. Due to mass effect on the skull base [9].

In our series, 1 case of large ethmoidal osteoma was reported with meningitis complication and LCR leak.

The most frequent localization is the frontal sinus, followed by the ethmoid, maxillary and sphenoid sinus [10]. While osteomas usually range in size from 2 to 30 mm, an osteoma with a diameter > 30mm or weighing > 110 g is considered a 'large' or 'giant' osteoma [11].

Computed tomographic scan represents the gold standard for radiographic investigations, It allows to determine the exact anatomic location of the tumor and its extensions [12].

The osteoma generally appears as a well-circumscribed, dense bony structure [13].

Magnetic resonance imaging allows to eliminate the others diagnosis. Moreover, it is useful in case of intracranial or intraorbital extension of the lesion; differential diagnosis has to be posed with other osteofibrous lesions of the paranasal sinuses, in particular, with fibrous dysplasia and ossifying fibroma or malignant lesions such as osteosarcoma [12].

Etiology has not been completely clarified yet; nevertheless, there are 3 main pathogenetic theories: osteogenic, traumatic, and infectious [6]. The embryologic theory posits that the origin of the neoplasm is the junction between the embryonic cartilaginous ethmoid and the membranous tissue of the frontal bone. The traumatic and infectious theories attempt to link the onset of osteoma to previous trauma and infections by the activation of osteogenesis [14,15].

There are 3 histological types according to Fu and Perzin's classification: eburnated osteoma, osteoma spongiosum and mixed osteoma [16].

Most osteomas are solitary and usually nonsyndromic but they

can also be observed as part of Gardner's syndrome, an autosomal dominant disease characterized by intestinal polyposis, osteomas, and cutaneous and soft-tissue tumors. The colonic polyps in the Gardner's syndrome carry a 100% risk of malignancy if untreated [17,18].

The surgical removal of a benign tumor, such as an osteoma of the nasal cavity and paranasal sinuses, should take into consideration safety and efficacy of removal as well as patient morbidity and the potential for cosmetic alterations.

Endoscopic surgery, external approach or both are the main treatments for symptomatic osteomas of the sinuses.

The choice of a surgical approach depends on the location, the size and the extension of the osteoma and the surgeon's experience [19].

In our experience, endoscopic approaches remain the gold standard for treatment of only symptomatic osteoma.

But some, such as Bartlett, suggest that also asymptomatic but rapidly growing osteomas should also be removed [20].

According to Castelnuovo et al., endoscopic surgery is indicated for frontal and fronto-ethmoidal osteomas located medially but staying outside the sagittal plane passing through the medial wall of the orbit and that does not massively involve the anterior and posterior wall of the frontal sinus, and ethmoidal osteomas with no involvement of the lateral wall but the size of the osteoma is not an exclusion criteria for the endoscopic approach since cavitation techniques can facilitate endoscopic resection of large frontal and ethmoid-fetal osteomas [21].

The endoscopic drill cavitation technique by exclusively endoscopic endonasal approach allows to remove the different forms of osteoma, including the lesion with erosion of the posterior wall of the frontal sinus with a large intracranial multilobulated osteoma and lateral or superolateral orbital wall attachment of the lesion. a small anteroposterior diameter of the frontal sinus in relation to a large volume frontal sinus) [5].

Similar to our results, they found this technique feasible for removal of ethmoid osteoma of all sizes including one with orbital extension. Others such as Akmansu et al [22] have reported removing these lesions with standard endoscopic.

Our practice has been to use a surgical exclusively endonasal approach with the endoscopic drill cavitation technique that allows the complete removal of an unusual osteoma.

Cavitation technique consisted to drill out the core of the lesion to the periphery, so as to leave a thin shell at the periphery easily detachable like drill cavitation according to Pech [23].

This gentle resection of the tumor, starting from the center toward the periphery, is extremely selective and conservative for the surrounding tissues [5].

Others studies reinforce the philosophy that size of the lesion, far lateral extension of the tumor in the frontal sinus beyond the lamina papyracea, and intraorbital involvement no longer represent absolute contraindications for purely transnasal endoscopic resection [5].

Main advantages of endoscopic approaches are closer visualization of the anatomy, less damage to the surrounding structures, preserves the natural endonasal drainage pathways, or creates new ones, better cosmetic results with less morbidity and shorter hospitalization, but



requires lengthier surgical training and greater experience. [6]In the opposite side the open approaches provide control of the lesions. However, some of the disadvantages, such as permanent scars, frontal recess stenosis, mucocele formation, wound healing problems, and paresthesias, are common [24].

Endoscopic and open approaches can be combined to facilitate radical tumour removal and reduce complications [25].

CONCLUSION

Nasal Osteoma is a benign, slow-growing, encapsulated neoplasm of bone origin of the nose and paranasal sinus. that are capable of extending to surrounding structures, which may result in severe complications such as orbital involvement or intracranial invasion. They most commonly occur in the frontal sinus

Endoscopic techniques offer an alternative approach, enabling closer and more direct visualization of the anatomy as well as avoiding damage to surrounding structures.

In our study, we presented the unusual and complicated forms for paranasal sinus osteomas has treated with endoscopic approach in our institution.

Endonasal endoscopic approach provides a safe and effective alternative to open approaches, offering cosmetic advantages and lowering the morbidity. This approach could be judiciously used in large unusual complicated osteomas.

Currently, the transnasal endoscopic approach proves to be a valid alternative to traditional open surgery in the treatment of frontoethmoidal and intraorbital osteomas.

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