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內文：

Abstract

1. The osteomas are osseous lesions with slow and asymptomatic growth that most of the times is a finding in radiological exams requested for other reason.
2. It's the most common benign neoplasm of the paranasal sinuses.
3. The osteomas are located mainly in the frontal sinus *(37–80%)*, followed by the ethmoidal sinuses (20%), maxillary sinuses and rarely in the sphenoid sinus.
4. Although osteomas are benign tumours, they may enlarge progressively and produce complications.
5. Their resection is not free of risks, so there is some controversy about the management of asymptomatic patients.
6. Endonasal surgery reduces the morbidity of the treatment but the location and size of the lesions do not allow to employ this technique in all cases.
7. Although osteomas may occur at any age, they are most frequently found in people over 40 years old.
8. Some authors have reported that the tumour is more common in young adults, with peak incidence from 10 to 20 years.
9. Male–female ratio ranges from 2:1 to 3:1.
10. The greater preponderance of sinus osteomas in men is attributed to men's greater exposure to trauma and the large size of their sinuses .
11. They usually appear as sporadic individual lesions, but they can also be part of the clinical manifestations of Gardner Syndrome, in which case they are usually multiple and tend to be found on the mandible, the cranium and the long bones

Aetiology and pathology

1. From an aetiological viewpoint, these lesions have been correlated to abnormal enlargements of embryonal tissues, previous craniofacial trauma, and chronic inflammatory process of nasal and sinus structures, but a specific cause–effect relationship between osteomas and the triggering event still remains to be defined.
2. The embryological theory postulates that osteomas arise at the junction of the embryonic cartilaginous ethmoid and membranous frontal bones.
3. Osteoma is usually classified into three histologic types according to bone formation:
   (1) eburneous type (hard laminated): Ivory type lesions contain compact, usually lamellar bone, with scant or no intertrabecular spaces.
   (2) cancellous type (spongy): In the cancellous type, the ratio of bone volume to intertrabecular space decreases and the morphology becomes similar to normal trabecular bone tissue.
   (3) mixed type (combining features of the eburneous and cancellous type)
4. No significant practical differences are found between these forms of morphology when diagnostic techniques, treatment and prognosis are considered.

Clinical features

1. Three variants of osteoma can be distinguished:

(1) Central: arise mainly from endosteum
(2) Peripheral: originate from the periosteum, quickly produces swelling, asymmetry and erosion of the surrounding structures
(3) Extraskeletal: resides within a muscle

2. Osteomas are benign, generally slow-growing, bone forming tumours limited almost exclusively to craniofacial and jaw bones.
3. They can be subdivided into bone surface tumours (or exostoses) that primarily involve the cranial vault, mandible, and external auditory canal and the more common paranasal sinus osteomas
4. The clinical presentation of paranasal osteomas covers a broad spectrum.
5. When they produce symptoms, headache or facial pain localised over the area of osteoma is the most common one followed by epistaxis.
6. The most frequent symptom in patients with osteomas of ethmoidal sinuses is frontal headache or facial pain (53%), frequently secondary to ostium obstruction or infection of the sinus.
7. Sphenoid sinus osteoma's most common clinical presentations are, in decreasing order, headache, invasion and deformity of the orbit, pneumocephalus with possible rhinorrhea and meningitis, and, rarely, abscess formation.
8. Initially, the osteoma takes the form of the paranasal sinus in which it originates, and with increasing size it invades adjacent orbital and intracranial cavities leading to variety of symptoms and serious complications.
9. These can be divided into:
   (1) orbital: proptosis, exophthalmos, diplopia, ptosis, vision changes, epiphora and dacryorrhea.
   (2) intracranial cavities/neurologic: headache, meningitis and brain abscess, intracranial pneumotocele, CSF leak, intracranial hypertension.
   (3) nasal: anosmia, rhinorrhoea, nasal obstruction, sinusitis and paranasal sinus cyst, mucocele.

Investigations

1. Paranasal sinus osteoma is detected incidentally in 0.0018~1% of plain sinus radiographs and in 3% of sinus computed tomographic images
2. Computed tomography (CT) scan is the suggested method for determining the regional anatomy and the extent of the lesion
3. Radiographically, osteomas typically manifest as homogenously calcified, lobulated, sharply defined tumours that tend to form polypoid intracavitary growths.
4. They characteristically arise within a sinus, conform to the internal contour of the sinus margin and may have a bosselated surface.
5. The differential diagnosis of a solitary osteoma includes periosteal osteosarcoma, osteochondroma, periosteal osteoblastoma, ossified periosteal lipoma, and myositis ossificans.
6. Fibrous dysplasia, ossifying fibromas, clival chordomas, cranial base meningiomas and other types of bone tumours must be considered in the differential diagnosis.
7. It should also include parosteal osteosarcoma – that presents as painful destructive masses with rapid growth, exostoses–bony excrescences considered as hamartomas that stop growing after puberty, but osteomas may continue growth after puberty
8. These different lesions may have a similar radiological appearance, but their borders are usually less well defined than those of osteomas.

Treatment

1. It is generally agreed that asymptomatic osteomas without intracranial, or orbital extension, or cosmetic deformity require no treatment. These should be followed up with serial radiographs to determine any change in size.
2. Sphenoid osteomas are exceptions to this rule and have to be removed as soon as possible due to the slow and gradual enlargement that can lead to compression of the visual pathways.
3. Smith proposed that asymptomatic and minimally symptomatic patients could be followed by serial radiographs but that surgery is indicated if the lesion fills the frontal sinus by more than 50% by volume.
4. Savic *et al*. proposed that ethmoidal sinus osteomas should be resected regardless of their size.
5. Others have proposed that osteomas should be resected when they are still small in size.
6. The osteomas which require surgery can be operated either by endoscopic surgery, open surgery or by combined method.
7. The choice must consider several factors such as tumor location, extension, dimension and the experience of the surgeon.
8. The surgical approach must protect the vital structures especially optic nerves and cribriform plate, while optimizing the ability to totally excise the osteoma with minimal cosmetic deformity.
9. Indications for surgery in paranasal osteomas include sphenoid osteomas, irrespective of size, presence of significant symptoms like unexplained headache, recurrent sinusitis, ocular symptoms, neurological symptoms, enlargement seen radiographically, extension beyond confines of the sinus, filling of more than 50% of the volume of the frontal sinus, location near the frontal sinus ostium and cosmetic deformity.
10. Endoscopic surgery can be carried out when osteoma is based on the inferior part of the posterior frontal sinus wall, limited to sinuses without evidence of orbital or intracranial extension.
11. Advantages of endoscopic surgery are excellent cosmetic results without any external incision, shorter duration of operative time, early discharge from hospital, closer and more direct visualisation during operation, minimal soft tissue dissection, and the absence of facial bony disruption.
12. Limitations of endoscopic surgery are difficult management of intraoperative complications, such as bleeding and inadequate control of the margins of the lesion.
13. The advantages of these open approaches are good visualisation and open access to the frontal sinus that also allows easy obliteration of the sinus if the nasofrontal duct is compromised.
14. Disadvantages of open surgery are permanent scar formation, blood loss, mucocele formation, CSF leak, post-operative frontal pain, parasthesia or anaesthesia from supraorbital nerve damage, frontal bossing and fracture of the bone flaps penetrating the anterior cranial fossa and/or damage to the Superior Longitudinal Sinus.
15. For large osteomas of the frontal sinus, the bicoronal approach is recommended.
16. This approach provides an excellent surgical exposure, allowing the complete excision of the lesion, limiting the intra- and postoperative complications, reducing the recurrence rates, and giving an ideal aesthetic result.
17. The supraciliar approach is usually chosen in bald patients or those with little hair

and in patients with small sinuses or small osteomas located at the anterior wall of the frontal sinus.

18. From the available literature, the surgical technique with lower recurrence rate and better aesthetic results seems to be the bicoronal approach.

Conclusion

1. The osteomas of the paranasal sinuses are benign lesions generally asymptomatic but may enlarge to produce complications.
2. Asymptomatic osteoma should be followed up by serial radiographs.
3. The choice of the operative approach and extent of the osteotomy depend on the dimension of the lesion, its relation with the anterior and posterior walls of the sinus, and the dimensions of the sinus.
4. The endoscopic procedure can constitute an important part of surgery undertaken for osteomas.
5. Open surgeries are required for large osteomas.

題號	**題目**
1	下列症候群中，何者易出現骨瘤(osteoma)和多生牙(hyperdontia)的情形? **(A)** 黎蓋氏症候群 (Riegel syndrome) **(B)** 戈林症候群 (Gorlin syndrome) **(C)** 外胚層發育異常 (ectodermal dysplasia) **(D)** 嘉德耐氏症候群 (Gardner's syndrome)
答案(D)	**出處：**出處：96 年第一次高等考試 基礎(二)_3 A:facial bone defect, frontal bone 發育不足，上顎前牙先天性缺牙，角膜和虹膜發育不全 B:自體顯性遺傳疾病，odontogenic keratocyst，異位性的大腦鐮鈣化，分岔的肋骨，basal cell carcinoma C:缺牙，無汗症，毛髮稀少 D: 自體顯性遺傳疾病，家族遺傳性結腸息肉，骨瘤，supernumerary teeth
題號	**題目**
2	下列骨腫瘤中，復發率最高者為: **(A)** 骨瘤(osteoma) **(B)** 造牙骨質細胞瘤(cementoblastoma) **(C)** 牙骨質-骨質化纖維瘤(cement-ossifying fibroma) **(D)** 幼年性骨化纖維瘤(juvenile ossifying fibroma)
答案(D)	**出處：**出處：94 年第一次高等考試