Mucocele in a pneumatized pterygoid process, challenging case managed by endoscopic surgery

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Abstract

We report the first published case of a mucocele found in a pneumatized pterygoid process (PPP) managed by endonasal endoscopic surgery. This case report highlights the difficulties that can arise from PPP during functional endoscopic sinus surgery (FESS) as the one encountered here

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Email: younes.steffens@ulb.be Phone: 0032483/43.73.50**Ethics approval and consent to participate:**The scientific publication of this case report was approved by the ethics committee of CHU Saint-Pierre.**Consent for publication**Written informed consent was obtained from the patient for the publication of this case report.

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Key clinical message

Pneumatized pterygoid process can make functional endoscopic sinus surgery difficult when it is the site of pathology and can lead to per and postoperative complication.

Introduction:

A mucocele of the paranasal sinuses is a benign, encapsulated and destructive formation filled with mucous fluid and lined with respiratory epithelium. This rare lesion has typically a slow evolution, so that mucoceles are often asymptomatic. On the other hand, they may lead to visual disturbance, headache or deep orbital

pain due to compression of adjacent structures.[1] The sphenoid sinus is affected by mucocele in only 1 to 7% of all case of paranasal sinus mucoceles.[2] Before any skull base surgery, the sphenoid bone needs to be thoroughly evaluated because anatomical variations can result in intraoperative complications. The most frequently encountered anatomical variations of the sphenoid sinus are: pneumatized pterygoid process (PPP) and anterior clinoid process, unilateral or bilateral vidian canal protrusion, carotid canal and optic canal protrusion.[3]

Here, we report the case of a mucocele developing from a PPP. We describe our surgical technique and the difficulties encountered during functional endoscopic sinus surgery (FESS) .

Case presentation:

A 37-year-old woman was sent to our department for a chronic left retro-orbital headache associated with nasal obstruction. She had no medical history in the past, especially no surgery. The ophthalmological exam did not show any signs of visual impairment and the neurological exam was normal. Nasal endoscopy was only remarkable for a bilateral inferior turbinate hypertrophy without any sign of sinusitis.

Cerebral computer tomography (CT) scan showed bilateral PPP and a mass filling part of the left sphenoid sinus and extending to the sphenoid bone greater wing. This lesion was included in a bony shell and showed bony erosion laterally, inferiorly and superiorly (Figure 1).

A magnetic resonance imaging (MRI) study of the sinuses showed a T2 hyperintense and T1 hypointense homogeneous mass in the left pterygoid process without enhancement in the gadolinium enhanced phase.

A mucocele of the left PPP was suspected and endoscopic resection with inferior turbinoplasty was recommended given the risk of progression of the lesion.

*(insert Figure 1)*During the operation, we first performed a maxillary meatotomy and a sphenoidotomy for anatomical landmarking (Figure 2). Then we made an incision in the mucocele, posterior to the sphenopalatine foramen. Inspection, with a 30° optic lens, of the inner part of the cavity formed by the mucocele showed a bony defect of the greater wing of the sphenoid bone without any evidence of cerebrospinal leak.

One week after surgery the patient presented to the emergency department for left rhinoliquorrhea without pyrexia or any meningeal sign and a postoperative cerebrospinal leak was suspected. We decided to initially treat the patient with acetazolamide 500mg twice a day and cefuroxime 500mg 3 times a day. As the rhinorrhea did not resolve, we opted for a surgical repair of the cerebrospinal leak by FESS. A solution of fluoresceine 5% highlighted multiple cerebrospinal leaks (Figure 2). Due to the PPP, the site of cerebrospinal leak was difficult to access by ES and required a wider opening of the cavity caused by the mucocele.

In order to minimize the invasiveness of the surgical procedure, we did not make incisions of the posterior maxillary wall to reach the cerebrospinal leak. We repaired the leak with umbilical fat, tissue glue associated with human collagen (Tachosil®) and a septal flap mucosa (figure 2).

After the second surgery the patient did't had any complication.

(insert Figure 2)

Discussion:

The presence of PPP is not rare but can complicate endoscopic surgery especially with pathologies eroding the osteo-meningeal barrier and increasing the risk of cerebro-spinal leak like in our case.

It is also well known that the sphenoid sinus can develop different pathology and present with many anatomical variations.

However, we only found one similar case report in the literature[4]; this case was described as a mucocele of the PPP and was managed with a craniotomy-approach resection, which is much more invasive than our approach and therefore can lead to more potential postoperative complications.

Another case of lesion of the PPP was described; it was a cholesterol granuloma managed by observation[5] given the slow evolution and the absence of symptoms in this case.

In our case, we decided to perform an incision of the mucocele due to the potential of extension to the cerebral cavity and the symptoms of the patients. To our knowledge and after reviewing the English and French literature, it is the first time that an endoscopic surgical approached is describe for a lesion of a sphenoid sinus with PPP.

We believe that our experience and the description of our operating technique as well as the difficulties encountered can be useful in the future, especially with the increasing endoscopic techniques in many hospitals.

Retrospectively, due to the technical difficulties encountered during this surgery, a conservative management with clinical observation and regular imaging follow-ups can be discussed weighing the symptomatic burden of the disease, the radiation and the risk of possible extension to the cerebral cavity against the risk of surgical complications.

But in our case, taking into account the young age of the patient, the presence of symptoms and signs of bony erosion on imaging, conservative management and imaging follows-ups was considered too risky. Besides, after having explained all this to the patient, she preferred to be managed by surgery preferably in the least invasive way possible.

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Conflict of interest:

The authors declare that they have no conflict of interest

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