Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/21877
DOI URL: http://dx.doi.org/10.21474/IJAR01/21877

CASE REPORT

LATE INTRACRANIAL EXTENSION OF A POST-TRAUMATIC FRONTAL MUCOCELE: A RARE CASE REPORT

Ayoub Jamal Eddine Elidrissi[1], Loubna Chouaf[2,3], Nawal Adali[2,3] and Mohamed Lmejjati[1]

1. Department of Neurosurgery, Faculty of Medicine of Agadir, Ibn Zohr University Agadir, Morocco.
2. Department of Neurology, Agadir University Hospital, Agadir, Morrocco.
3.N.I.C.E. Research Team, R.E.G.N.E. Research Laboratory, Faculty of Medicine and Pharmacy, Ibn Zohr University, Agadir, Morrocco.

Manuscript Info

Manuscript History
Received: 21 July 2025
Final Accepted: 24 August 2025
Published: September 2025

Key words:
frontal mucocele, intracranial extension, late-onset focal epilepsy.

Abstract

Introduction: Mucoceles are defined as benign tumors that develop at the expense of the sinus mucosa caused by inflammatory obstruction of the sinus ostium, rarely post-traumatic or post-surgical.Despite their benign nature, these tumors have a powerful lytic potential on the bone walls of the sinuses and gradually spread to the orbit and skull, which can manifest as neurological signs, including neurological deficits or epileptic seizures.

Case report: This is a 48-year-old patient who was involved in a road accident in 1996, causingtrauma to the right frontal impact point and a fracture of the orbital roof. Twenty years after the head injury, he gradually developed frontal headaches with visual fogging on the right side and generalized tonic-clonic epileptic seizures. Clinical examination revealed a predominantly left frontal syndrome and slight right exophthalmos with downward displacement of the right eyeball.Brain MRI showed a T1 hyposignal and T2 hypersignal mass in the right frontal sinus with intracranial and orbital extension, consistent with a frontal mucocele. The EEG revealed paroxysmal abnormalities in the form of spikes and poly-spikes in the anterior hemispheres, predominantly in the right frontal lobe.The patient was placed on sodium valproate at a dose of 500 mg three times a day, and surgical treatment of the mucocele was planned.

Discussion: Mucoceles of the facial sinuses are a rare condition, corresponding to slow-growing benign pseudocystic tumors that develop at the expense of the sinus mucosa but have an aggressive and expansive course. They rarely occur post-traumatically, which is the case in our patient given the chronology of signs after the traffic accident.Clinical manifestations vary and are related to the extent of spread to neighboring structures. Intraorbital extension manifests itself as visual disturbances (such as diplopia or decreased visual acuity). As for intracranial spread, symptoms can range from a simple headache to complete intracranial hypertension syndrome. Furthermore, rare cases of focal or generalized epilepsy in the literature have revealed a diagnosis of mucocele.A CT scan or,

Corresponding Author:-Ayoub Jamal Eddine Elidrissi
Address:-Department of Neurosurgery, Faculty of Medicine of Agadir, Ibn Zohr University Agadir, Morocco.

preferably, a brain MRI is sufficient to confirm the diagnosis with an examination of the orbital-cerebral extension and a search for possible complications.Treatment is exclusively surgical, either externally or endoscopically. Long-term postoperative recurrence is not uncommon.

Conclusion: In cases of late-onset focal or generalized epilepsy associated with history of head trauma with an impact point on the sinuses, consideration should be given to ruling out a sinus mucocele with intracranial extension.

Introduction:-

Mucoceles are defined as benign tumors that develop at the expense of the sinus mucosa caused by inflammatory obstruction of the sinus ostium, rarely post-traumatic or post-surgical.Mucoceles generally develop in the frontal sinus(70 to 80%), followed by the ethmoid sinuses (25%),fronto-ethmoid sinuses (10 to 14%) and maxillary sinuses (3% orless).Despite their benign nature, mucoceles have apowerful lytic potential on the bone walls of the sinuses andgradually spread towards the orbit and skull, which canmanifest itself in neurological signs, particularly aneurological deficit or an epileptic seizure.

Case report:

This is a 48-year-old patient who was involved in a road accident in 1995, resulting in trauma to the right frontal impact point and a fracture of the orbital roof. Twenty years after the head injury, the patient presented with frontal headaches and blurred vision on the right side, complicated one year prior to admission by generalized tonic-clonic seizures.Neurological examination revealed frontal syndrome consisting of apathy, executive dysfunction with depressive mood, and a left grasp reflex.The ophthalmological examination revealed slight right exophthalmos with downward displacement of the right eyeball, visual acuity of 7/10 bilaterally, and early cataract on the right. The rest of the examination including the fundus, was normal.

CT scan showed a lesion in the right frontal sinus with intracranial and orbital invasion (fig 1). Magnetic resonance imaging (MRI) of the brain showed a T1 hyposignal and T2 hypersignal mass in the right frontal sinus with intracranial and orbital extension, consistent with a frontal mucocele (fig 1). The electroencephalogram showed paroxysmal abnormalities in the form of spikes and poly spikes,predominantly in the right frontal lobe.Therapeutical ly, the patient was placed on sodium valproate at a dose of 500 mg three times a day. Surgical treatment of the mucocele was proposed but refused by the patient, who was then lost to follow-up.

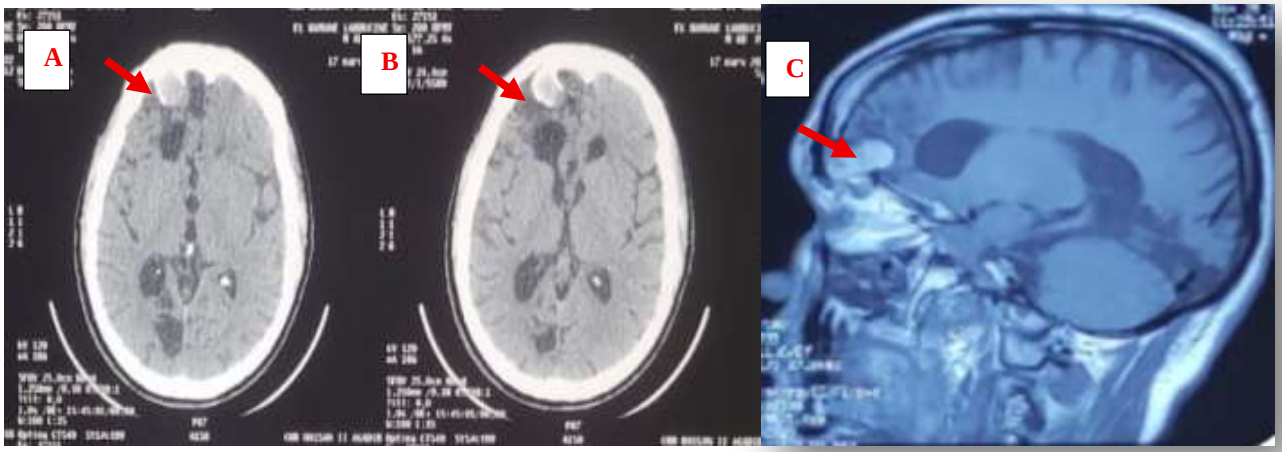

Figure 1: A, B: axial CT scan of our patient shows frontal mucocele with invasion of the right frontal lobe. C: Sagittal MRI scan of our patient, T1 weighted imagesagittal sectionshowing:filling of the right frontal sinus with orbital and intracranial invasion by the mucocele.

Discussion:

Mucoceles of the facial sinuses are slow-growing, benign pseudocystictumorsthat develop at the expense of the sinus mucosabut have an aggressive and expansive course [1].Post-traumatic mucoceles are rare [2]. In fact,only 17 cases have been reported and well documented. Theycan appear several years after thetrauma. Koudstaal et al [3]

found a widerange of incidence between 1 and 35 years after thetrauma, while other authors have reported casesup to 50 years later[4]. Due to their slow growth, mucoceles of the frontal sinuscan remain asymptomatic for a long time [5].

Clinical manifestations are variable and related tothe extent of spread to neighboring structures.Orbital spread manifests as visual disturbances(such as diplopia or decreased visual acuity) [5].Cases of aphasia, focal neurological deficit, andeven hemiparesis secondary to intracranial envasionhave been reported [6,7]. Furthermore, rare casesof focal or generalized epilepsy in the literaturehave led to the diagnosis of a mucocele [8]. CT scan or, preferably, brain MRIare sufficient to confirm the diagnosis with a study ofthe orbital-cerebral extension and investigation ofpossible complications[9].

In the early stages, mucoceles appear ashypointense on T1-weighted images and hyperintense on T2-weighted images; in advanced stages,they appear hyperintense on both T1-weighted andT2-weighted images [10]. Treatment is exclusively surgical, either byexternal approach or endoscopic approach[11].Theendoscopic approach involves decompression, and consists of drainage and extensive marsupialization of the mucocele cavity[12,13]. Proper resection of the sinus wall must be performed to ensure proper drainage and prevent recurrence [12,13].Long-term postoperative recurrence is notuncommon[11]. Adequate primary management of frontal sinus fracturesis essential to prevent mucoceles[14].

Conclusion:

In all cases of focal or generalized late-onset epilepsyassociated with a history ofhead trauma with an impact point on the sinuses, consideration should be given to ruling out a sinus mucocele with intracranial extension.

References:

1. Chirurgie Maxillo-faciale et de ChirurgieOrale. févr2016;117(1):11-4.
2. Rosado P, de Vicente JC, Villalaín L, Fernández S, Peña I. Posttraumatic Frontal Mucocele: Journal of CraniofacialSurgery. juill2011;22(4):1537-9.
3. Koudstaal MJ, van der Wal KGH, Bijvoet HWC, Vincent AJPE, Poublon RMI. Post-trauma mucocele formation in the frontal sinus; a rationale offollow-up. International Journal of Oral and Maxillofacial Surgery. déc 2004;33(8):751-4.
4. Mandrioli S, Valente L, Galiè M. Posttraumatic Glabellar Mucocele: Case Report. Craniomaxillofacial Trauma & Reconstruction. Déc2018;11(4):320-3.
5. Avery G, Tang RA, Close LG. Ophthalmic manifestations of mucoceles. Ann Ophthalmol. août 1983;15(8):734-7.
6. Voegels RL, Balbani AP, Santos Júnior RC, Butugan O. Frontoethmoidal mucocele with intracranial extension: a case report. Ear Nose Throat J. févr1998;77(2):117-20.
7. Nakayama T, Mori K, Maeda M. Giant Pyocele in the Anterior Intracranial Fossa —Case Report—. Neurol Med Chir(Tokyo). 1998;38(8):499-502.
8. Lachanas VA, Kyrmizakis DE, Chimona TS, Karatzanis AD, Spilioti MG, Velegrakis GA. Symptomatic epilepsy due to a huge frontal sinus mucocele.Auris Nasus Larynx. mars 2005;32(1):81-3.
9. El houari.G,Baha.W, Adli.M,Karami. R, Benhmidoune.L, Rachid.R, Belhadjji.M, MUCOCÈLE FRONTALE AVEC EXTENSION ORBITO-PALPÉBRALE- CASHISTORIQUE - A Service d'ophtalmologie Adulte-hôpital 20 Aoutcasablanca. Health Sci. Dis: Vol 16 (4) October-November-December 2015
10. Alshoabi S, Gameraddin M. Giant frontal mucocele presenting with displacement of the eye globe. Radiology Case Reports. juin 2018;13(3):627-30.
11. Gross CW, Harrison SE. The modified lothrop procedure. Otolaryngologic Clinics of North America. févr 2001;34(1):133-7.
12. Arnavielle S, Vignal-Clermont C, Galatoire O, Jacomet PV, Klap P, Boissonnet H *et al*. Compressive optic neuropathy related to an anterior clinoid mucocele. Journal Francaisd'Ophtalmologie. 2010;33(3):208. e1-6
13. Garaventa G, Arcuri T, Schiavoni S, Fonzari M. Anterior clinoid mucocele: a trans-nasal endoscopic approach. Min-Minimally Invasive Neurosurgery. 1997;40(04):144-147
14. Rohrich RJ, Hollier LH. Management of frontal sinus fractures. Changing concepts. Clin Plast Surg. janv 1992;19(1):219-32.