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The endonasal endoscopic management of pediatric lateral frontal mucocele

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ABSTRACT

OBJECTIVES: The aim of this report is to show the usefulness of endoscopic sinus surgery in management of lateral frontal mucocele in pediatric patient.**CASE PRESENTATION:** A 14 years old girl presented with right frontal bone depression and headache. CT and MRI showed lateral mucocele occupying the right frontal sinus. The patient was managed successfully by image-guided endoscopic sinus surgery and she was well after two years follow up.**DISCUSSION & CONCLUSION:** Frontal mucoceles in children are rare. We report a rare case of a child with lateral frontal mucocele with no known etiology, treated successfully by image-guided endoscopic sinus surgery with no recurrence after two years follow-up. This case shows the usefulness of image-guided endoscopic sinus surgery in treatment of lateral frontal mucocele in children.© 2020 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Mucoceles are benign slowly growing, pseudo-cystic, mucus containing lesions that found in the paranasal sinuses. They are lined by respiratory epithelium. Mucoceles can cause bony resorption and displacement of nearby structure. presentation of mucoceles is depending on their location. CT scan is the modality of choice for diagnosis. Treatment is either by endoscopic or external surgical approach [1–3]. Mucoceles are rare in pediatrics. There are only a few data in literature regarding to Endoscopic management of mucoceles in pediatrics [1–3]. We are reporting a child with lateral frontal mucocele with no known etiology, treated successfully by endoscopic sinus surgery with no recurrence after two years follow-up. This case was diagnosed and managed at a tertiary care hospital in Al-Dammam, Saudi Arabia.

2. Case report

A 14 years old girl presented to the ENT clinic with one-month history of right frontal bone depression and headache. The patient had no other complain. No prior history of facial surgery, sinus infection or facial trauma and was otherwise healthy. Her past medical and surgical history was unremarkable. ENT and ophthalmic examination were normal. Computed tomography of the paranasal sinuses showed a low attenuation lesion filling the lateral aspect of the right frontal sinus. It is associated with thinning and resorption of the anterior, lateral and posterior walls. The anterior wall shows posterior depression suggestive of fracture (Fig. 1). This was further evaluated with magnetic resonance imaging. It showed the mass to have cystic characteristics with thick enhancing wall (Fig. 2). There is no intracranial extension or thickening of the adjacent pachymeninges.

The patient and her family were fully counseled about the nature of the disease, the surgical management, treatment plans and recurrence. The patient underwent marsupialization of the right frontal mucocele with endoscopic sinus surgery procedure performed by A. A (rhinologist). Draf IIa frontal sinusotomy was performed (Fig. 3a). Mucocele was identified by 45-angled endoscope (Fig. 3b). Image guided adequate marsupialization was done (Fig. 3c) and the anterior inferior thick wall was removed. Postop-

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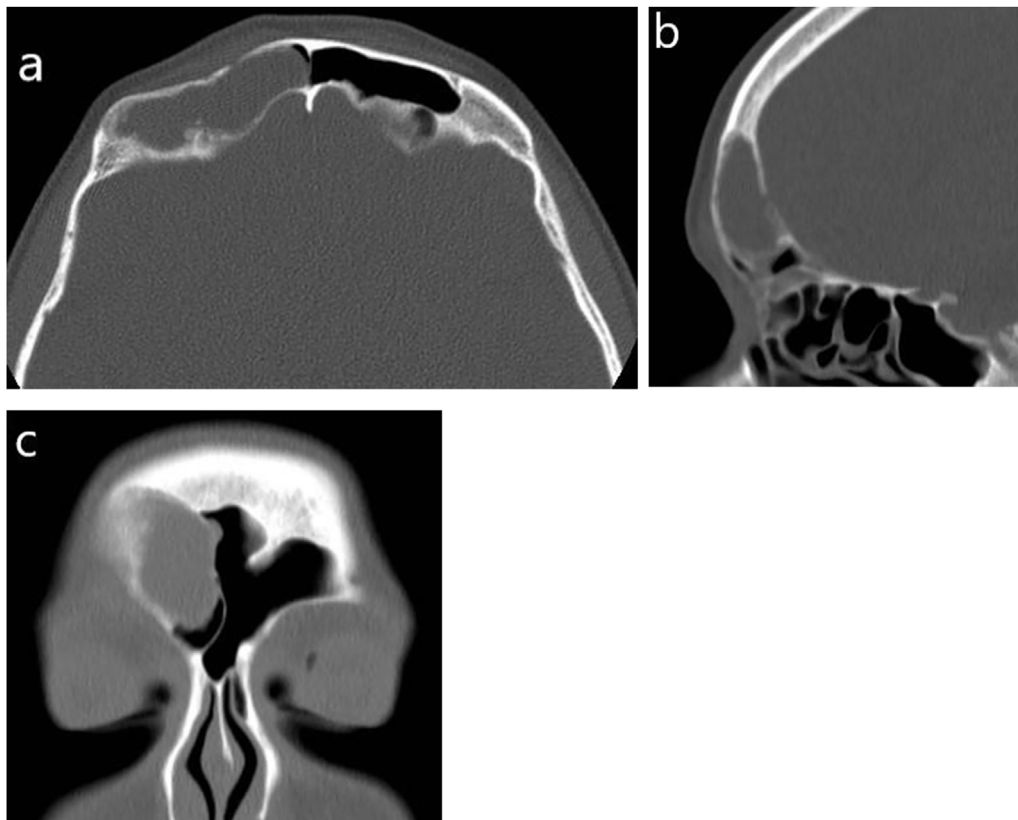


Fig. 1. Computed tomography of paranasal sinuses in bone algorithm in axial (a), sagittal (b) and coronal(c) planes. Right frontal sinus lesion with depressed fracture of anterior wall and resorption of the lateral and posterior walls.

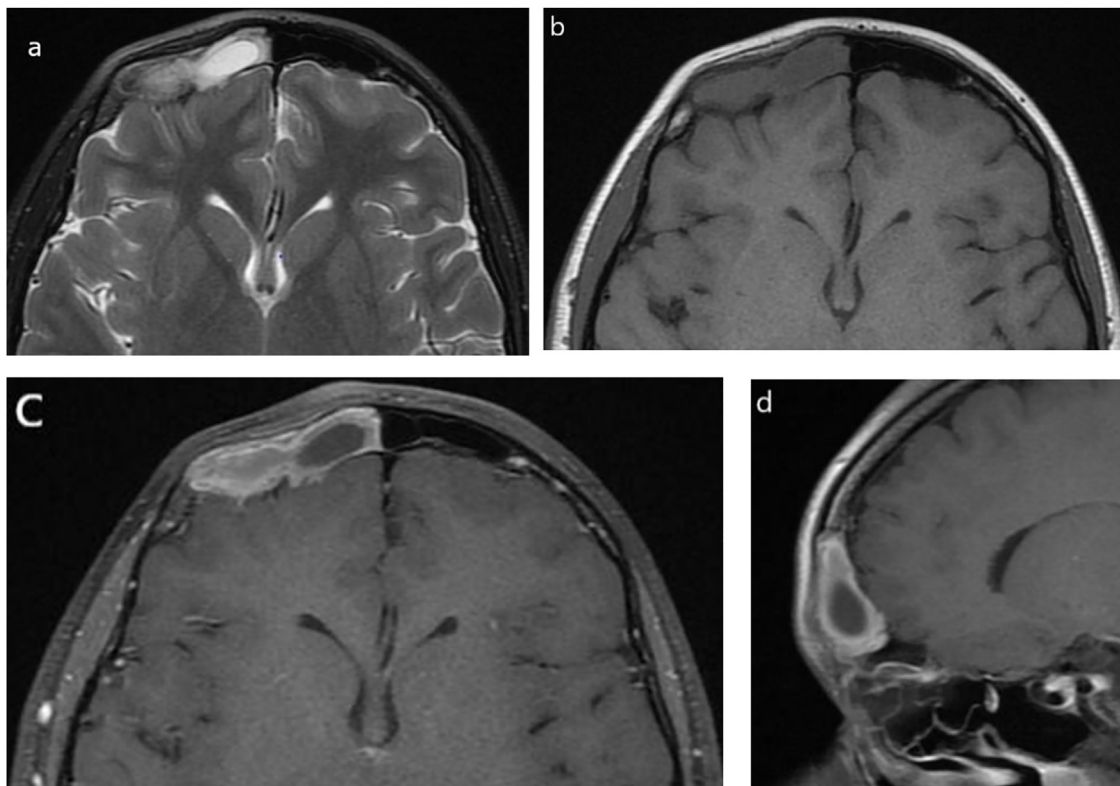


Fig. 2. MRI paranasal sinuses axial T2 (a), axial T1 pre-contrast (b) and post-contrast axial (c) and sagittal (d) T1. The right frontal sinus lesion shows intermediate to high T2 signal intensity with thick irregular wall of lower signal intensity. It shows intermediate (lateral part) to low signal intensity (medial part) on T1. Post contrast shows irregular enhancing wall with cystic center and no extrasinus extension.

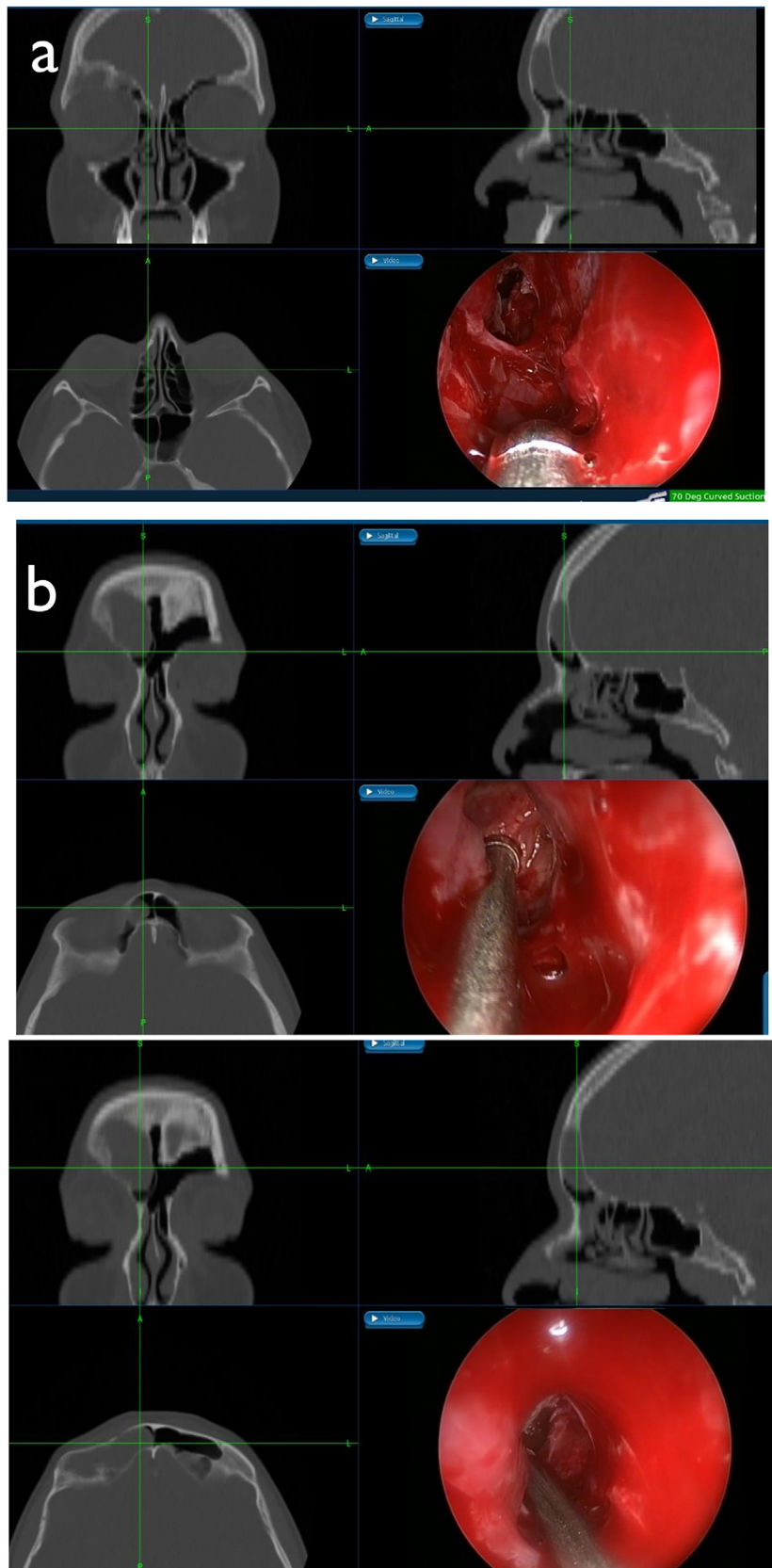


Fig. 3. Endoscopic approach to frontal mucocele: Draf IIa wide frontal sinusotomy (a), 45-angled endoscopic view of the mucocele (b), image-guided wide marsupialization of mucocele (c). Case report was structured in compliance with the SCARE guidelines (11).

erative follow-up for two years, the patient was doing well with no complications.

3. Discussion

Mucoceles are slowly growing, pseudo-cystic, mucus-containing lesion that found in the paranasal sinuses and lined by respiratory epithelium. Depending on the size of the lesion, mucoceles can be destructive and can cause bone resorption [1]. Paranasal Mucoceles are uncommon and they are rare in pediatric age group [2,3]. In adults, the most common sites of sinus mucoceles are the frontal, frontoethmoidal, and ethmoid sinuses. frontal sinus mucoceles are not common in pediatrics as in adults, possible cause is late development of frontal sinus [1–3].

Sinus Mucocele can present with various clinical manifestations depending on the site and size of the lesion. Most common symptoms of frontal mucocele are a frontal headache and facial pain. Other common symptoms are orbital symptoms like proptosis, periorbital swelling, and diplopia. Rarely frontal mucocele can be entirely asymptomatic [4]. Etiology of paranasal mucocele include a history of previous paranasal sinus surgery, trauma, chronic sinusitis or less commonly, tumor. Mucoceles can also develop spontaneously [5]. In pediatrics, mucoceles have been found strongly associated with cystic fibrosis [1]. However, two case series report a total of ten patients with paranasal sinus mucoceles, none of them have cystic fibrosis [2,3].

Radiological evaluation is an important initial step in reaching the diagnosis and in preoperative assessment of paranasal sinus mucoceles. Plain radiographs have limited role in the evaluation of paranasal mucoceles and CT scan considered the gold standard. CT scan provides the surgeon with details of bony anatomy and will show the bony erosions or destruction. Detailed knowledge of anatomy is crucial in endoscopic sinus surgery. MRI is helpful in the evaluation of the surrounding soft tissue and can be used to differentiate between mucocele and neoplasm [2,6].

Paranasal sinus mucocele can be managed by endoscopic or by external approach. recently endoscopic management is the modality of choice of paranasal sinus mucocele. It has lower morbidity rate and the recurrence rate at or close to 0% [5]. However, several studies prefer the external approach when the pathology cannot be reached by endoscope like in lateral frontal mucocele [7,8]. Moreover, some authors believe that endoscopic management is contraindicated in lateral frontal mucocele [5]. In a case series of seven patient with lateral frontal mucocele treated by endoscopic surgery, the authors found that selected cases of lateral frontal mucocele can be treated by endoscopic sinus surgery, specifically those mucoceles which extended medially to a virtual sagittal plane tangential to the medial side of the ocular globe [9]. In another retrospective study, ten patients with lateral frontal sinus lesions underwent endoscopic drainage with the help of image-guidance, Endoscopic drainage was successful in most of the patients, but one of them underwent a revision endoscopic surgery with trephination five months after the initial treatment and another patient lost the follow-up [10,11].

Pediatric sinus mucoceles have been successfully treated by endoscopic sinus surgery in several studies. Endoscopic sinus surgery is associated with lower complications, lack of external incision and less hospital stay [1–3]. However, endoscopic sinus surgery of frontal mucocele in pediatric is rarely mentioned in literature. To the best of our knowledge, this is one of the few documented cases of lateral frontal mucocele treated successfully with image-guided endoscopic sinus surgery in pediatric with no evidence of recurrence after two years of follow-up.

4. Conclusion

Frontal mucoceles in children are rare. We report a child with lateral frontal mucocele with no known etiology, treated successfully by image-guided endoscopic sinus surgery with no recurrence after two years follow-up. This case shows the usefulness of image-guided endoscopic sinus surgery in treatment of lateral frontal mucocele in children.

Declaration of Competing Interest

The authors report no declarations of interest.

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No funding was required for this research.

Ethical approval

This review is approved by the institutional review board at KFSH DAMMAM.

Consent

Written informed consent was obtained from the patients for publication of this case series and accompanying images.

Author contribution

Abdullah A Al-Shakhs: First author, study concept and design, data collection and analysis.

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Maha A. Alharbi: Co-author, study concept and design, data collection and analysis.

Fadhel Almolani: Co-author, study concept and design, data collection and analysis.

Hashim W Alshakhs: Co-author, study concept and design, data collection and analysis.

Mohammed A Alameer: Co-author, study concept and design, data collection and analysis.

Abdullah H Alawadh: Co-author, writing the paper.

Ahad M AlMohammadi: Co-author, writing the paper.

Registration of research studies

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Dr. Ali AlMomen.

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