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REVIEW

Treatment strategies for frontal sinus anterior table fractures and contour deformities

Sean W. Delaney*

Department of Otolaryngology Head and Neck Surgery, Keck School of Medicine, University of Southern California, 1540 Alcazar St, Suite 204Q, Los Angeles, CA 90033, USA

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Summary Anterior table frontal sinus fractures can result in aesthetically displeasing contour deformities. Acute anterior table frontal sinus fractures that are depressed may be reduced with an open, closed, or endoscope-assisted approach. Delayed contour deformity camouflage can be achieved using bone grafts, titanium meshes, methyl methacrylate, hydroxyapatite cement, and polyether ether ketone implants. The selection of surgical approach to repair a frontal sinus contour deformity depends on the fracture severity, chronicity, complexity, patient comorbidities, and surgeon preference and experience. Advancement in endoscopic technology and expertise has created a paradigm shift toward a less invasive approach to the frontal region, with considerably less morbidity than conventional open techniques.
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* Tel.: +1 626 688 8024.
E-mail address: Sean.delaney@med.usc.edu.

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Introduction

Frontal sinus fractures comprise 5–30% of maxillofacial fractures, with isolated anterior table fractures accounting for 33% of frontal sinus fractures.[1–4] Isolated anterior table frontal sinus fractures are generally associated with minimal complications. However, due to the prominence of the frontal sinus in the upper face, a depressed fracture in this region can result in an aesthetically displeasing contour deformity.

Factors considered in selecting the approach to repair an isolated anterior table fracture without nasofrontal outflow tract (NFOT) involvement include fracture severity, chronicity, complexity, patient comorbidities, and surgeon preference and experience. In this paper, we review the current treatment strategies of isolated depressed anterior table fractures in the acute and delayed setting.

Anatomy

The frontal sinuses develop as paired sinuses within the frontal bone (Figure 1). They are absent at birth and grow to reach adult size in late adolescence.[3,4] Asymmetry between the sinuses is common, and 10–15% of individuals have only one frontal sinus.[3–5] The anterior table of the frontal sinus is thicker than the posterior table, particularly in the region of the supraorbital buttress. The posterior table of the frontal sinus forms the anterior wall of the anterior cranial fossa. Superiorly and laterally, the frontal sinus is bounded by frontal bone. Inferiorly, the NFOT is situated medially, whereas the roof of the orbit forms the lateral floor of the frontal sinus.

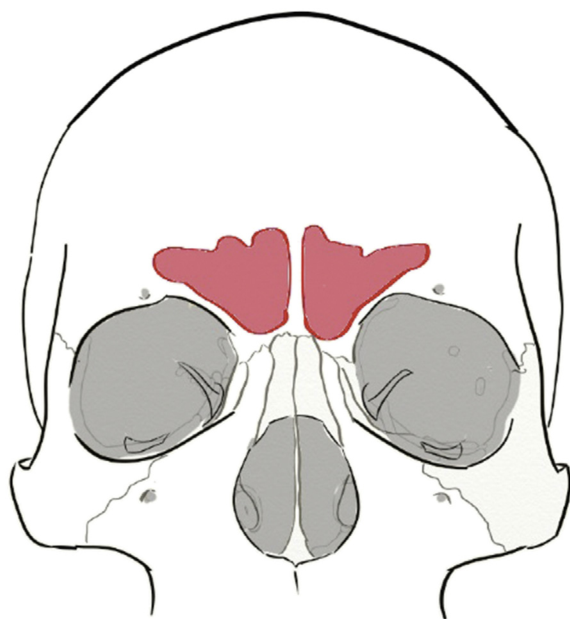

Figure 1 The frontal sinuses develop as paired sinuses within the frontal bone.

The aesthetic forehead

When divided into horizontal thirds, the ideal forehead as measured from the trichion to the glabella should have equal lengths to the middle and lower face. An aesthetically pleasing forehead imparts a gentle convexity on profile view that begins at the nasion, travels slightly anterior to form the glabella, before gently sloping posteriorly. The ideal nasofrontal angle formed between the nasal dorsum and glabella on profile should lie between 115° and 135° (Figure 2). Due to the effects of sexual hormones, males have a heavier and more prominent supraorbital ridge, but

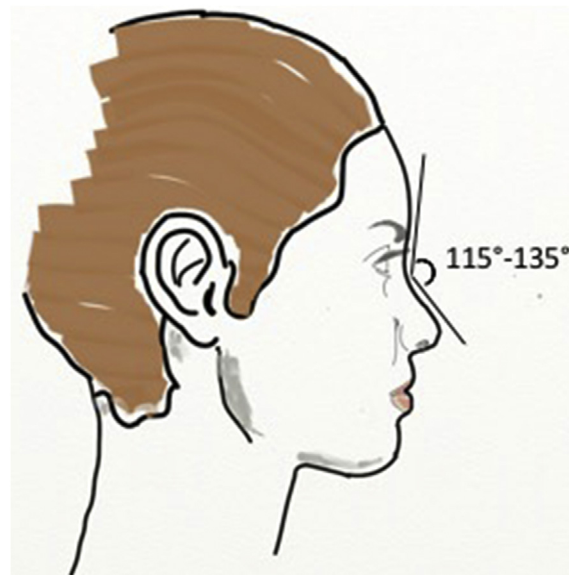

Figure 2 Ideal nasofrontal angle.

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