

Ultrasound-Confirmed Frontal Bone Fracture

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A 21-year-old man walked into the ED complaining of mild headache after colliding with another player during a baseball game. The patient denied loss of consciousness and noted numbness over his left forehead. He denied vision change, fluid from his nose or ears, dizziness or other injury. He had normal mentation, no neck pain, and an otherwise non-focal exam. He declined pain medication.

A visible depression is noted overlying the left frontal bone. (Figure 1.) An ultrasound (US) at the bedside demonstrates an isolated comminuted fracture of the left frontal sinus with depression of one segment into the sinus and an overlying flap created by the other fragment. The CT image confirmed this (Figure 2).

The force required to fracture the frontal sinus ranges from 800-2200 lbs, more than enough to cause associated injuries.¹ Complications include: CSF leak, osteomyelitis, meningitis, brain abscess or mucopyocele, and cavernous sinus thrombosis. Operative repair is best performed by an ENT specialist using endoscopic techniques to assure good cosmetic outcome.²

Currently CT, which is the criterion reference for diagnosis of skull fractures, is most important to evaluate for inner table fractures or co-existing mid-face fractures.³ Despite the superiority of CT, US can be used in remote or austere environments. Research comparing CT to US for superficial facial fractures needs to be done to determine test characteristics.



Figure 1. Facial view showing depression of the left frontal bone

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REFERENCES

1. Nahum AM. The biomechanics of maxillofacial trauma. *Clin Plast Surg.* 1975; 2:59-64.
2. Strong EB, Kellman RM. Endoscopic repair of anterior table--frontal sinus fractures. *Facial Plast Surg Clin North Am.* 2006; 14:25-9.
3. Sun JK, Lemay DR. Imaging of Facial Trauma. *Neuroimaging Clin N Am.* 2002; 12:295-309.

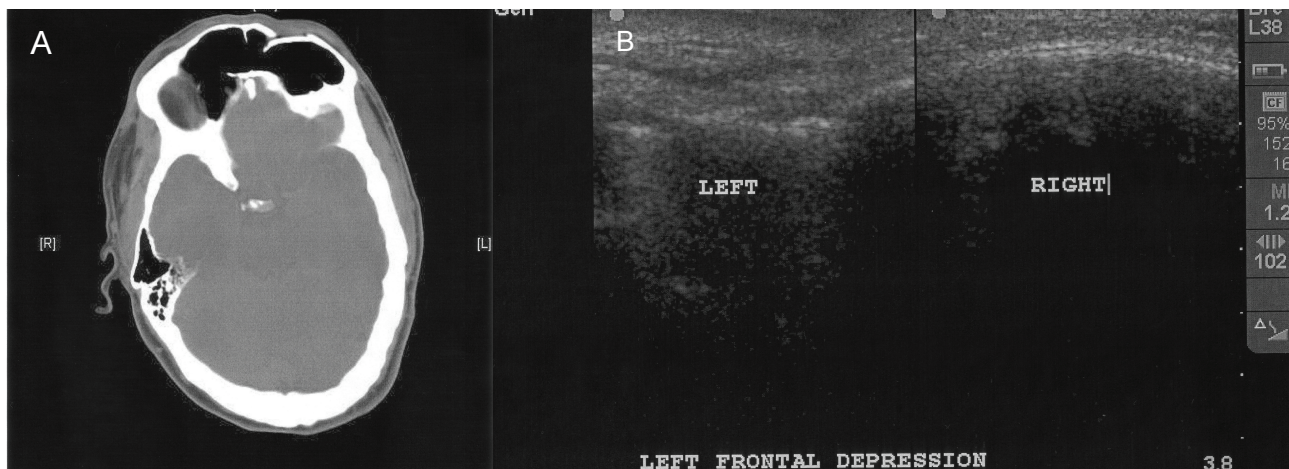


Figure 2. A) CT-facial bones, depicting depression of left frontal bone into the frontal sinus with blood in the frontal sinus. B) Ultrasound-Frontal bones, depicting depression of the left frontal bone and a normal right frontal bone.