

Figure 1

An 89-year-old man presented for evaluation of facial trauma after falling onto a paved surface.

An 89-year-old man presented to the ED with facial trauma due to a mechanical fall after losing his balance on uneven pavement and hitting the right side of his face. Physical examination revealed an ecchymosis inferior to the right eye and tenderness to palpation at the right maxilla and bilateral nasolabial folds. Maxillofacial computed tomography (CT) was ordered for further evaluation; representative images are presented above (**Figure 1a and 1b**).

What is the diagnosis?

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■ Answer

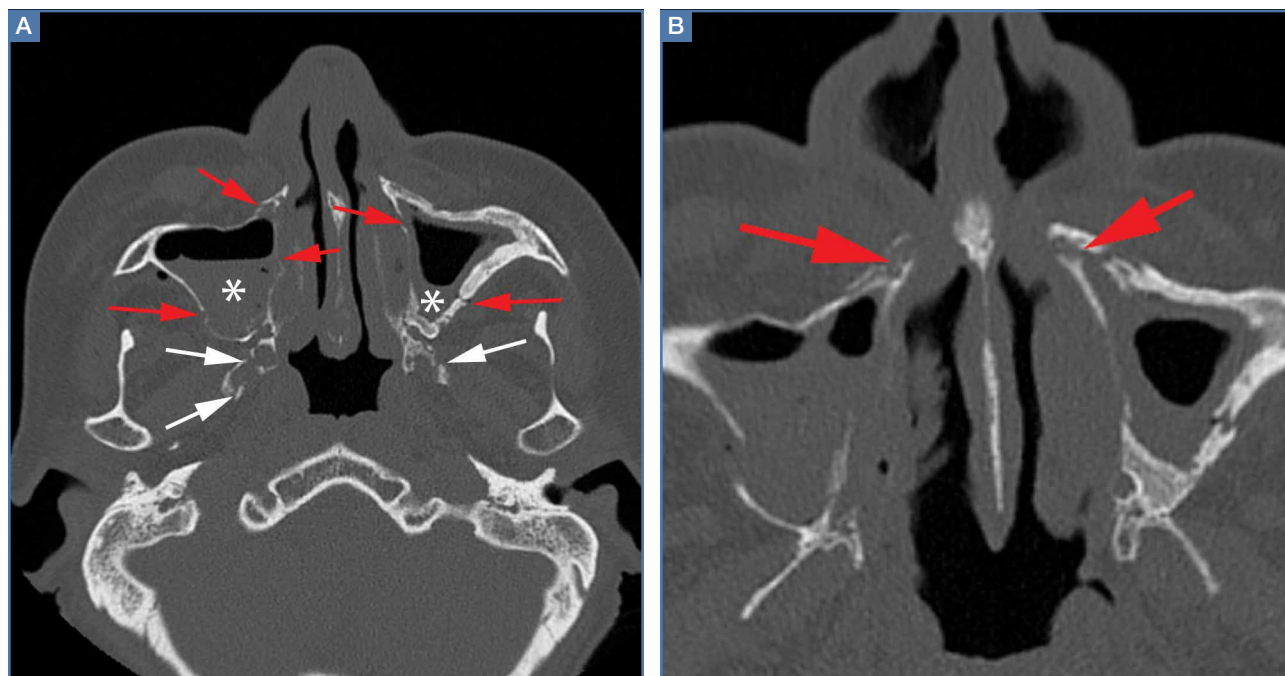


Figure 2

A noncontrast CT of the maxillofacial bones demonstrated acute fractures through the bilateral pterygoid plates (**white arrows, Figure 2a**). The fractures extended through the medial and lateral walls of the bilateral maxillary sinuses (**red arrows, Figure 2a**), and propagated to the frontal processes of the maxilla (**red arrows, Figure 2b**), extending toward the alveolar process, indicating involvement of the anterolateral margin of the nasal fossa. The full extent of the fracture is best seen on a 3D-reconstructed image (**red arrows, Figure 3**). Additional images (not presented here) confirmed no fracture involvement of the orbital floors, nasal bones, or zygomatic arches. Expected posttraumatic hemorrhage was appreciated within the maxillary sinuses (**white asterisks, Figure 2a**).

Le Fort Fractures

The findings described above are characteristic of a Le Fort I fracture pattern. Initially described in 1901 by René Le Fort, a French surgeon, the Le Fort classification system details somewhat predictable midface frac-

ture patterns resulting in various degrees of craniofacial disassociation.¹ Using weights that were dropped on cadaveric heads, Le Fort discovered that the pterygoid plates must be disrupted in order for the midface facial bones to separate from the skull base. As such, when diagnosing a Le Fort fracture, fracture of the pterygoid plate must be present, regardless of the fracture type (Le Fort I, II, and III).²

Le Fort I Fracture. This fracture pattern (**red line, Figure 4**) is referred to as a “floating palate” and involves separation of the hard palate from the skull base via fracture extension from the pterygoid plates into the maxillary sinus walls, as demonstrated in this case. The key distinguisher of the Le Fort I pattern is involvement of the anterolateral margin of the nasal fossa.²

Le Fort II Fracture. This fracture pattern (**blue line, Figure 4**) describes a “floating maxilla” wherein the pterygoid plate fractures are met with a pyramidal-type fracture pattern of the midface. The maxillary teeth form the base of the pyramid, and the fracture extends superiorly through the infraorbital rims bilaterally and to-

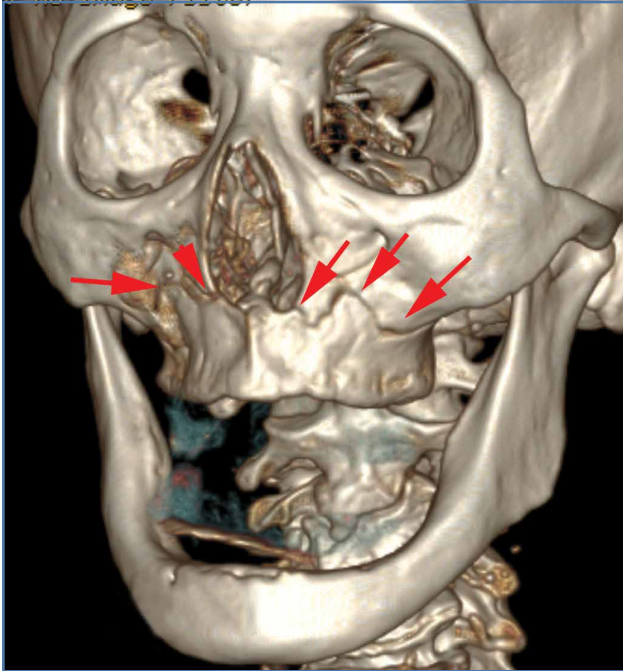


Figure 3

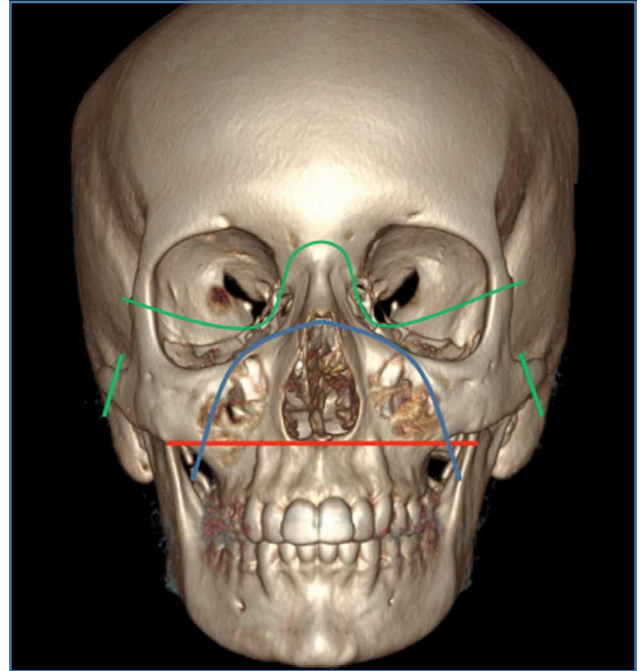


Figure 4

ward the nasofrontal suture.^{2,3} Le Fort II fractures result in the maxilla floating freely from the rest of the midface and skull base.

Le Fort III Fracture. This fracture pattern (green lines, Figure 4) describes a “floating face” with complete craniofacial disjunction resulting from fracture of the pterygoid plates, nasofrontal suture, maxillofrontal suture, orbital wall, and zygomatic arch/zygomaticofrontal suture.^{2,3}

It is important to note that midface trauma represents a complex spectrum of injuries, and Le Fort fractures only account for a small percentage of facial bone fractures that present through Level 1 trauma centers.² Le Fort fracture patterns can coexist with other fracture

patterns and also can be seen in combination with each other. For example, one side of the face may demonstrate a Le Fort II pattern while the other side concurrently demonstrates a Le Fort III pattern. Though not robust enough for complete description of and surgical planning for facial fractures, this classification system is a succinct and well-accepted means of describing major fracture planes.

References

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