ENHANCING LONG-TERM MEMORY

UNDERSTANDING INSTEAD OF
MEMORIZING LE FORT FRACTURES

Lea Alhilali
MD
HonorHealth
Phoenix, Arizona
@teachplaygrub

Saeed Fakhran
MD
Radiology Partners
Phoenix, Arizona
Learning Objectives

- Understand
  - the concept underlying facial buttresses

- Apply
  - facial buttresses to the framework of midface anatomy

- Master
  - LeFort classification using the concept of facial buttresses
To understand LeFort, you need to understand **facial buttresses**. They are not true anatomic structures but a way of **understanding facial structure**.

Facial bones support the facial structures like a table supports food.

Vertical buttresses are like **table legs** and horizontal buttresses like a **table top**.
In the face, the two main structures the buttresses support are the **orbits** & the **alveolar ridges** of the maxilla & mandible supporting the **teeth**.
Unlike tables, the forces upon the face are not just gravity. There is also the **upward force from the mandible from chewing**.

And this upward force of mastication is actually **much stronger** than the force of gravity.
Mastication sends force from the mandible through the maxilla & this force is transferred all the way to the skullbase.
Buttresses are the horizontal & vertical supports (tables) resisting the **downward pull of gravity** & the **upward force of mastication**.
There is one horizontal buttress (table top) for each structure that needs to be supported.
Horizontal Buttresses

Maxillary
Upper
Transverse

Supporting the orbit

Supporting the maxillary teeth

Supporting the mandibular teeth

Mandibular
Lower
Transverse

Supporting the mandible itself

Mandibular
Upper
Transverse
Vertical buttresses are organized exactly how you would organize the pillars of a house to support the roof.
Vertical Buttresses

Three supporting the maxilla and going all the way to the skullbase (sphenoid or frontal bone)

Posterior Vertical

One supporting the mandible going all the way to the skullbase (glenoid fossa)

Medial Maxillary

Lateral Maxillary

Posterior maxillary
Vertical buttresses act as **suspension wires for the maxilla**, suspending it from the skullbase. They are what keep your face on!
LeFort fractures are when your face (maxilla) gets separated or taken off!

To do that we must cut all of the suspension wires holding it to the skull base.
This is why the **pterygoid plate** (posterior attachment) is **ALWAYS** fractured in LeFort fractures.

If we don't cut the posterior attachment, then the maxilla will **sag** not separate.
So for every LeFort...

You have to cut the anterior two suspension wires.....

And the posterior suspension wire
Where we cut the other two vertical buttresses determines what type of LeFort fracture it will be.

Posterior buttress/suspension wire (pterygoid) always must be cut or the maxilla sags and does not separate.
Cut Low = LeFort 1

Case: Francis Deng rID: 90041
Cut Middle = LeFort 2
Cut High = LeFort 3

Case: Mostafa El-Feky rID: 90795
Vertical buttresses are like **suspension wires** holding up the maxilla. To detach the maxilla in a LeFort, you must cut all 3 maxillary suspension wires.

Posterior wire/buttress (pterygoid plate) must **always** be cut or the maxilla sags but doesn't separate.

Where the other two wires/buttresses are cut (low, middle, or high) determines which type of LeFort fracture.
So just think of cutting the suspension wires to the maxilla....

...and you'll never have to memorize the LeFort classification again!