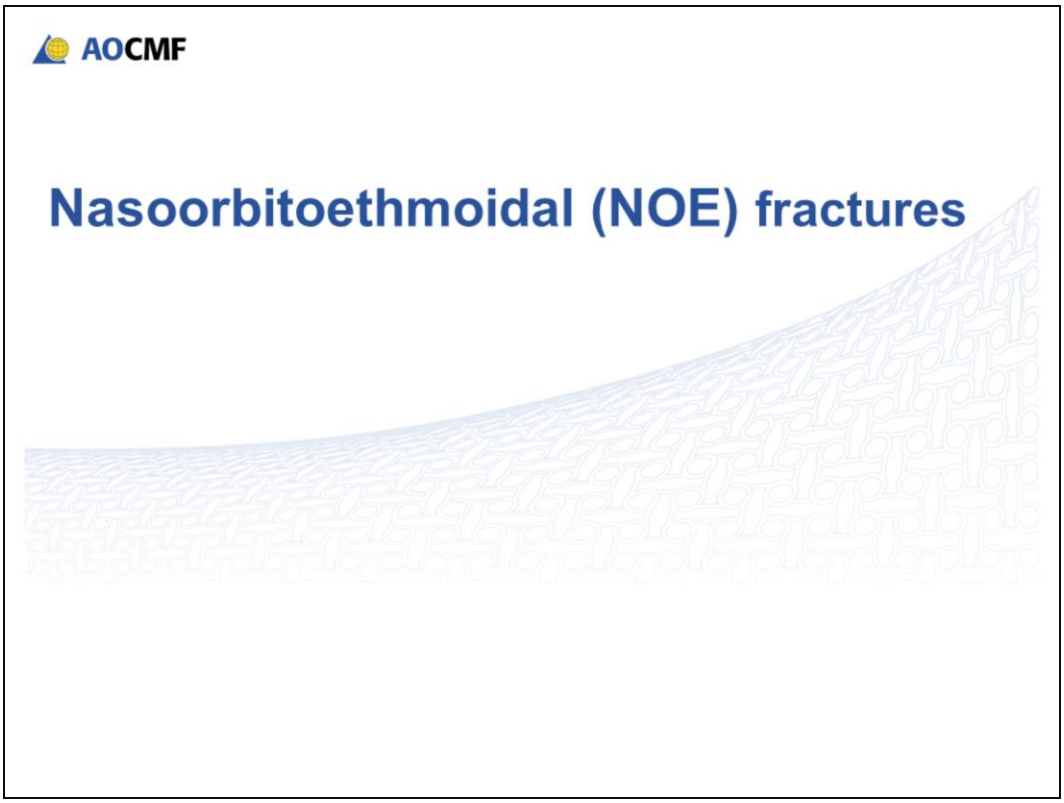


Version 2 (December 12, 2018)

Faculty can add a clinical or imaging picture of an NOE fracture

## Learning objectives

- Describe different types of NOE fractures
- Recognize signs and symptoms of NOE fractures
- Select appropriate imaging modalities and interpret the findings
- Formulate principles of management

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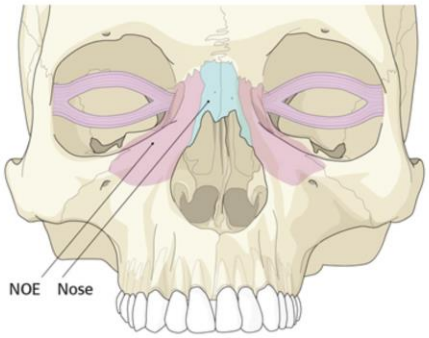
## Components of NOE

- Bone:
  - Nasal bones/septum
  - Medial and infraorbital rims
  - Medial orbital wall




- Soft tissue:
  - Skin (nasal and eyelids)
  - Medial canthus
  - Lacrimal drainage system

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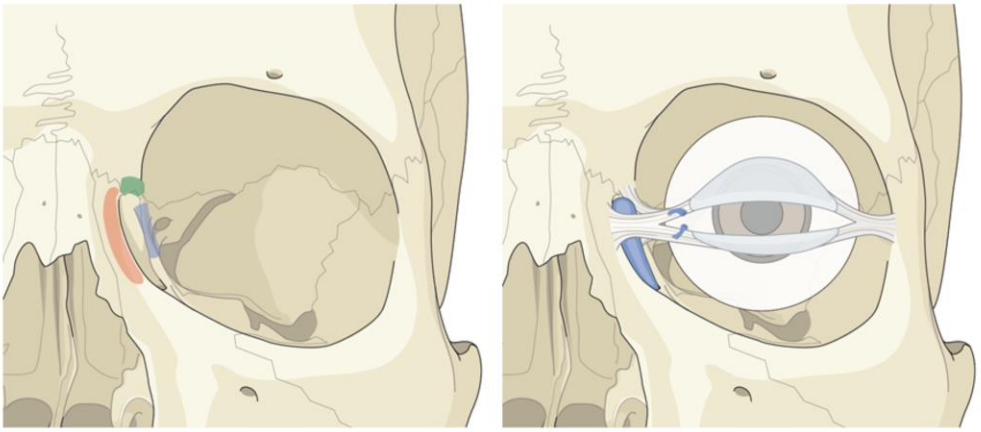

- Medial canthal tendon:
  - Three limbs—anterior, posterior, superior
- Classification of NOE fractures based on the central fragment that bears the medial canthal tendon

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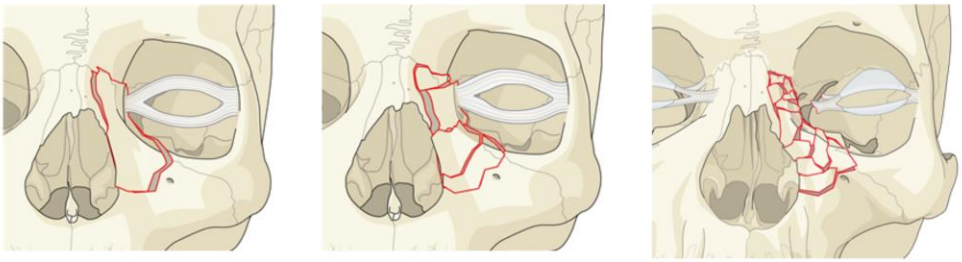
## Classification



Type I Type II Type III

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Reminder: Classification of NOE fractures based on the central fragment that contains the medial canthal tendon

Unilateral or bilateral, simple or comminuted

Frequently associated with ZMC fractures

# Examination

- Nasoseptal examination:
  - Airway
  - Anosmia
  - Cerebrospinal fluid (CSF) rhinorrhea
  - Loss of dorsal support
- Ocular examination
  - Visual acuity, EOM, and pupillary response
  - Diplopia
  - Canthal position
- Ophthalmology consultation

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# Examination

- Mobility or laxity of medial canthal tendon is indicative of NOE complex fracture

"Bow-string" or
lid traction test

Bimanual test

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## Examination

- Normal intercanthal distance
  - Female 32–33 mm
  - Male 33–34 mm
  - Rule of 1/3's: intercanthal distance equal palpebral fissure width


- Telecanthus
  - Increased intercanthal distance

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## Telecanthus deformity

- Lateral displacement of the medial canthal tendon
- Rounding of the medial palpebral fissure
- Widening of the NOE/nasal dorsum
- Transverse shortening of the palpebral fissure

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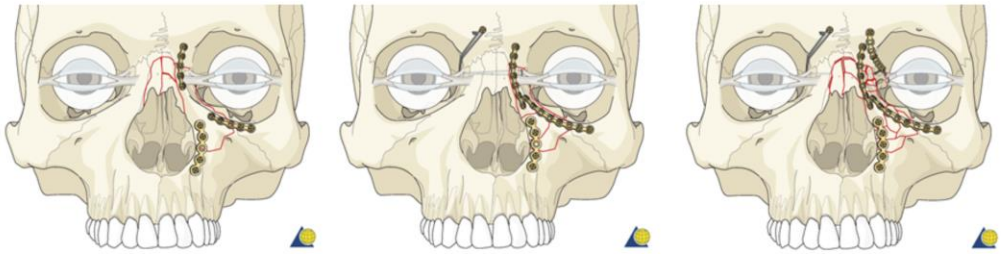
Cosmetic deformity generally results from the stigmata and sequelae of telecanthus, which results from lateral displacement of the medial canthus, rounding of the medial palpebral fissure, widening of the NOE region, and transverse shortening of the palpebral aperture.

# Fixation methods

Goal of treatment is restoration of intercanthal distance by anatomical repositioning of medial canthal tendon

Type I | Type II | Type III



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## Management of type I

- Approaches for simple isolated fractures include:
  - Upper vestibular
  - Eyelid incisions
- Plating of nasofrontal, nasomaxillary, and infraorbital rim buttresses (not necessarily all 3)
- Consider coronal approach for significant displacement

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Consider nasal dorsum support: Depends on septal and midvault nasal support

Transnasal wiring:

- Objective is to medialize the central fragment
- Posterior to lacrimal crest

## Management of type II

- Approaches include:
  - Coronal vs direct local incisions
  - Eyelid incisions
  - Upper vestibular
- Plate bone pieces (stable to unstable)
- Transnasal wiring may be required

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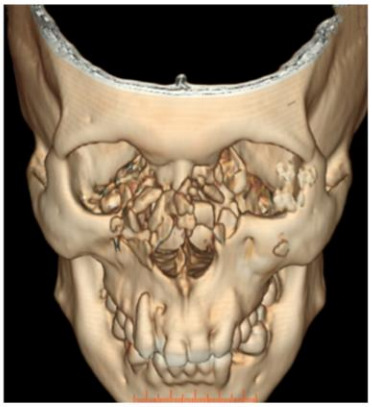
Consider nasal dorsum support: Depends on septal and midvault nasal support

Transnasal wiring:

- Objective is to medialize the central fragment
- Posterior to lacrimal crest

## Management of type III

- Wide exposure including coronal
- Repair orbital rims first
- May need to reconstruct medial orbital wall/floor
- Transnasal canthopexy
  - Transnasal wiring
  - Canthal barb/anchor



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Consider nasal dorsum support: Depends on septal and midvault nasal support

Transnasal wiring:

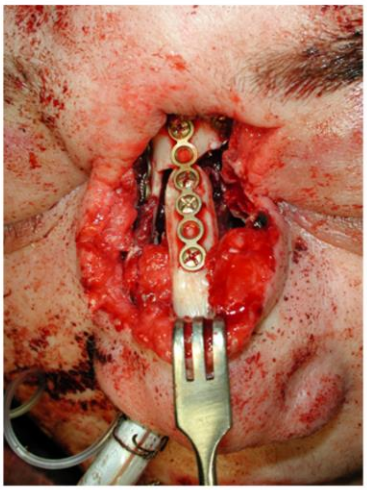
- Objective is to medialize the central fragment
- Posterior to lacrimal crest

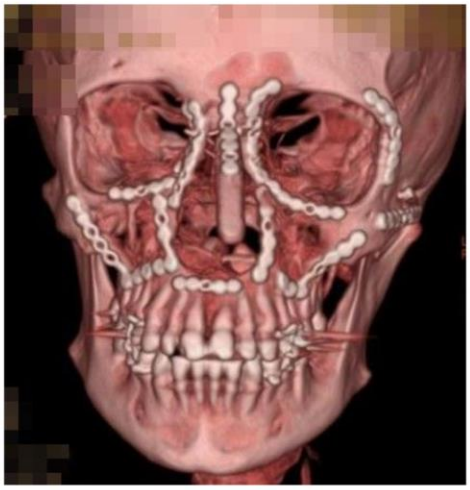
Many techniques but positioning and vector (posterior and superior to

posterior lacrimal crest) critical to all

## Bone graft

Primary bone grafting for dorsal nasal support





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Note: to clean new image

## Soft-tissue adaptation

- Postoperative nasal bolster splint
  - Reduces swelling
  - Redrapes soft tissues to underlying skeletal framework
  - Does not maintain medial canthal tendon position
  - Prevents pseudotelecanthus
  - Beware of skin necrosis

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Postoperative splinting does not address the canthal position—it is purely to address the soft-tissue draping over the nose.

## Take-home messages

- NOE complex fractures
  - Unilateral or bilateral, simple or comminuted
- Inadequate treatment leads to telecanthus
- Medial canthal tendon repair is key for success
- Bone graft for dorsal nasal support
- External nasal splints aid soft-tissue adaptation

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