Galeazzi and Monteggia Fractures: What are the critical elements?

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• Figures and cases for this talk taken in their entirety from:
  • Raymond Pensy, M.D. (Monteggia portion)
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Galeazzi Fractures

• Described by Ricardo Galeazzi
• Radial shaft fracture
• DRUJ dislocation
Galeazzi Fractures

• Operative treatment absolutely indicated
• Anatomic reduction of radial shaft fracture required for DRUJ reduction
• Assessment of DRUJ stability after radial fixation
  • Splinting in supination usually all that is required to maintain reduction
  • Surgical stabilization of the DRUJ (ligamentous repair, ulnar styloid fixation) rarely indicated
Galeazzi Fractures

• Recognizing the injury may be difficult when subtle

• Should be suspected in all isolated radial shaft fractures, however:
  • DRUJ injury NOT present in majority of isolated radial shaft fractures (Ring, et al. Isolated radial shaft fractures are more common than Galeazzi fractures. J Hand Surg Am. 2006;31:17-21)

• Contralateral radiographs helpful in determining the presence or degree of DRUJ instability
Galeazzi Fractures

• Importance of interosseous membrane (IOM) to DRUJ stability is emphasized by contribution of distal oblique bundle (DOB), present in 40% of specimens studied (Moritomo H. The distal interosseous membrane: current concepts in wrist anatomy and biomechanics. J Hand Surg Am. 2012;37:1501–7)

• Other studies have looked at degree of radial shortening as a marker of DRUJ instability

• Key is to reassess DRUJ stability after reduction/fixation of radius

From: Atlas of Upper Extremity Trauma. W. Andrew Eglseder, M.D
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Galeazzi Fractures

• If ulnar styloid fracture present of adequate size, consider fixation

• Presence of ulnar styloid fracture does not preclude presence of soft tissue injuries involving TFCC and/or DRUJ ligamentous structures
Galeazzi Fractures

• Assessment of DRUJ stability after radial fixation can be challenging

• Conflicting literature exists regarding need for and duration of immobilization in supination

• If reduction confirmed radiographically, need for specific treatment of the DRUJ is rare
  • Open DRUJ dislocations with significant soft-tissue disruption may be one exception
Galeazzi Fractures

• Surgical approach:
  • Standard anterior approach to radial shaft utilizing interval between FCR and BR with mobilization of the radial artery ulnarly
**Fig. 23.5** Lateral antebrachial cutaneous nerve (*black arrow*) and cephalic vein (*white arrow*)

**Fig. 23.6** Perforators from the radial artery to the radial skin flap

**Fig. 23.7** Radial dorsal sensory nerve (*arrow*) exiting between the brachioradialis (BR) and extensor carpi radialis longus

**Fig. 23.8** Fascial incision along the BR, with the radial artery to be maintained ulnarly and not circumferentially dissected
**Fig. 23.9** Dorsal sensory nerve (*arrow*)

**Fig. 23.10** Interval between BR and dorsal sensory nerve radially and radial artery ulnarly
Fig. 23.14  Position of plate between the pronator teres (PT) and the flexor digitorum superficialis and flexor pollicis longus
Galeazzi Fractures

- Lag screw fixation, when possible, preferable with mini-frag (2.0 mm) screws to avoid iatrogenic commination
- Provisional mini-frag plating can also be useful
Fig. 23.21  (a) A 2.0-mm mini plate can be used for provisional fixation if needed, with pre-drilling of a hole. (b) Plate and screw positioned to create an axilla for compression. (c) Eccentrically load compression screw
Fig. 23.22 (a) Definitive plating with 3.5-mm LC-DCP. (b) Compression screw insertion. (Yes, you can compress with the mini-plate in place.) (c) Compression screw insertion. (d) Two inboard screws inserted and seated. (e) Remaining screws inserted. (f) Inboard and outboard screws inserted. (Two more screws proximally and distally would be used clinically.)
Galeazzi Fractures

• Example Case:
Galeazzi Fractures

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Galeazzi Fractures

• Example Case:
Galeazzi Fractures

• Fixation of ulnar styloid:

**Fig. 23.24** Incision to distal ulnar styloid. This incision is generally shorter, utilized in this dissection for demonstration purposes

**Fig. 23.25** Ulnar nerve, dorsal sensory branches
Fig. 23.26 Diagram of primary and deep retinacula over the extensor carpi ulnaris (ECU)
Galeazzi Fractures

- Post-operative protocol:
  - Immobilization in near-full supination in sugartong postop
  - Early conversion to Munster brace in 45-60 degrees supination
  - At 2 weeks, ROM from full supination to neutral
  - At 4 weeks, unrestricted ROM
Monteggia Fractures

• Described by Giovanni Battista Monteggia
• Ulnar shaft fracture
• Radial head dislocation
Monteggia Fractures

- Operative treatment absolutely indicated
- Anatomic reduction of ulnar shaft fracture required for radial head reduction
- Assessment of radial head reduction after ulnar fixation
  - Radiographic
  - Clinical
  - If radial head fails to reduce:
    - Confirm ulnar reduction
    - Consider interposition of annular ligament
Pathoanatomy

• Fracture of the ulna and dislocation of the radial head

• **RADIOCAPITELLAR AND PROXIMAL RADIO-ULNAR JOINT**
Definition

This lesion is defined by fracture of the ulna and dislocation of the radial head from the capitellum and the proximal radio-ulnar joint.
Bado Classification

- Bado I: Anterior dislocation radial head, fracture diaphyseal ulna
- Bado II: Posterior dislocation radial head, fracture of the ulna
  - Further subdivided by Jupiter into involvement of coronoid and ulna
Bado III: Fracture of ulna, lateral dislocation of the radial head
Bado IV: Fracture of radius and ulna, anterior dislocation of radial head
Monteggia Fractures

• Current fixation strategy:
  • Anatomic reduction, rigid fixation
  • Specific attention to the contour of the ulna

The Adult Monteggia Fracture: Patterns and Incidence of Annular Ligament Incarceration Among 121 Cases at a Single Institution Over 19 Years

Max Hamaker, MD,* Amy Zheng, BS,* W. Andrew Eglseer, MD,† Raymond A. Pensy, MD†

17% (14/81) of Bado I fractures in this series had annular ligament incarceration
Posterior Interosseous Nerve Entrapment

Posterior Interosseous Nerve Entrapment
THANK YOU!