Proximal Tibiofibular Joint Dislocation as a Maisonneuve Equivalent Fracture: A Therapeutic Approach

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Introduction

- Dislocation of the proximal tibiofibular joint (PTFJ) + ankle injury: Infrequent and represents a diagnostic challenge.

- Mechanism: Pronation-external rotation.
  - The energy exits through the PTFJ instead of the proximal fibula.

- Early diagnosis and treatment: of paramount importance.
  - Chronic pain and posterolateral knee instability.
  - Peroneal nerve injury (chronic traction by the dislocated fibular head).

- Anatomical reduction of the PTFJ: Mandatory to restore the fibular length in order to obtain anatomic reduction at the ankle.

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Objectives and Methods

Objectives

1. To report three cases with PTFJ dislocation in association with ankle injury.

2. To provide a treatment guide based on the management of these patients.

Methods

• Case Report.

• Retrospective Analysis of three patients with PTFJ dislocation in association with ankle fracture.
  o Surgically treated between 2009 and 2016.

• For each case:
  o Clinical history at admission.
  o Pre and post operative radiographs and computed tomography (CT)
  o Clinical follow up
Case 1

- V.A.C.
- 45 years.
- Motor vehicle accident.

At admission:
- Pain and swelling at the left ankle.
- Pain at the proximal third of the ipsilateral leg ¿Maisonneuve injury?

Diagnosis:
- PTFJ dislocation.
- Ankle syndesmotic injury.

Treatment:
1. PTFJ open reduction + 1 positioning screw.
2. Closed reduction of the distal tibiofibular joint + 2 positioning screw
Proximal Syndesmosis
Preoperative

Proximal Syndesmosis
Postoperative
Case 2

- V.M.I
- 16 years.
- Fall from staircase.

At admission:
- Pain and deformity at the left ankle.
- Pain at the proximal third of the ipsilateral leg.

Diagnosis:
- Trimalleolar ankle fracture.
- PTFJ disslocation.

Treatment:
1. Posterolateral + Medial approach: ORIF of posterior and medial malleolus.
2. PTFJ open reduction + 1 positioning screw.
3. Closed reduction of the distal syndesmosis + 2 positioning screw.
Proximal Syndesmosis Preoperative

Proximal Syndesmosis Postoperative
Case 3

- G.M.S
- 30 years
- Blast injury
- At admission:
  - Deformity and swelling at the left ankle.

Diagnosis:
- Open tibial pilon fracture.
- PTFJ dislocation.

Treatment:
1. Removal of external fixator.
2. ORIF of tibial fracture with endomedular nail.
3. PTFJ open reduction + 1 positioning screw.
4. ORIF of distal fibula.
Discussion

- Subtle radiographic abnormalities at the PTFJ:
  - Proximal displacement of the fibular head.
  - Widening of the PTFJ space.
  - Asymmetry compared to the contralateral knee.

- CT of the knee: obtained to confirm the diagnosis in all patients.

- Anatomical reduction was obtained in all patients.
  - Checked by ankle and knee CT.

- At final follow up:
  - None of the patients had knee pain.
  - All returned to their labor and recreational activities.
Discussion

- PTFJ dislocation + ankle injury ➔ Our recommended management:

  1. High index of suspicion? ➔ CT
  2. Open reduction of the PTFJ: Identification of the peroneal nerve.
  3. Anatomical reduction checked fluoroscopically and by direct view.
  4. Fixation with one 3.5 mm cortical positioning screw from the fibula to the tibia (slightly distal to PTFJ).
  5. Closed or open reduction of the ankle injury.
The PTFJ dislocation in association with ankle fracture is an infrequent injury.

A high index of suspicion is needed and the diagnosis is confirmed with an ankle and knee CT.

Our recommended treatment:
- Open reduction and screw fixation of the PTFJ as the first step in order to allow anatomical reduction of the distal injury at the ankle.