Ankle injuries concomitant with tibial shaft fractures

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Introduction

• Tibial shaft fractures often cause unexplained ankle pain and stiffness even when the satisfactory bony union has been achieved.

• Some previous studies reported separate posterior malleolar fractures in tibial shaft fractures.

• Orthopaedic surgeons need to recognize the concomitant ankle joint injuries and appropriately manage them.
Purpose

• Investigate

(1) classify the ankle injury patterns

(2) factors associated with ankle injuries in tibial shaft fractures
Materials and Methods

• Retrospectively reviewed consecutive tibial shaft fractures with CT exam

• Exclusion
  - previous Op, old fracture or nonunion
  - tibial plateau fracture
  - primary ankle fracture or pilon fracture

• Data collection
  - Demographic data (age, gender)
  - Location of fractures
  - Tibial fracture shape (transverse/ oblique/ spiral)
  - Presence of ankle injuries
  - Type of ankle injury
Location of fractures

Tibial fracture shape

Transverse
Oblique
Spiral

\[
\frac{A}{A + B} \times 100
\]
Ankle injuries

- AITFL avulsion Fx
- Posterior malleolar Fx
## Results

### Data summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>71</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>48.3 (SD 16.7)</td>
</tr>
<tr>
<td>Male : Female, n (%)</td>
<td>37 (52.1) : 34 (47.9)</td>
</tr>
<tr>
<td>Right : Left, n (%)</td>
<td>32 (45.1) : 39 (54.9)</td>
</tr>
<tr>
<td>Tibial fracture location (%)</td>
<td>32.5 (SD 14.3)</td>
</tr>
<tr>
<td>Fibular fracture location (%)</td>
<td>57.7 (SD 26.8)</td>
</tr>
<tr>
<td>Tibial fracture shape (spiral/oblique/transverse)</td>
<td>46/18/7</td>
</tr>
<tr>
<td>Concomitant ankle injury (tibial side, not lateral malleolar Fx)</td>
<td>40 cases (56.3 %)</td>
</tr>
<tr>
<td>PM Fx</td>
<td>16 cases</td>
</tr>
<tr>
<td>AITFL avulsion Fx</td>
<td>6 cases</td>
</tr>
<tr>
<td>PM Fx + AITFL avulsion Fx</td>
<td>17 cases</td>
</tr>
<tr>
<td>Unclassified</td>
<td>1 case</td>
</tr>
</tbody>
</table>

PM, posterior malleolus; AITFL, anterior inferior tibiofibular ligament; Fx, fracture.
Tibial shaft fracture (n=71)

- Spiral (n=46)
  - 38 Ankle injuries (83%)
    - surgical indication 25 case
  - surgical indication 25 case

- Oblique (n=18)
  - 2 ankle injuries (11%)
    - surgical indication 1 case

- Transverse (n=7)
  - No ankle injuries

Surgical indication: >2mm displacement and articular surface involvement over 25%
Conclusions

• Ankle joint injuries are frequently concomitant with spiral type tibial shaft fractures and need surgical treatment, which foot and ankle surgeons should keep in mind.

• CT exam could detect subtle ankle injuries in tibial shaft fractures.

• Posterior malleolar fractures and AITFL avulsion fractures are frequently concurrent ankle injuries in tibial shaft fractures.
Conclusions

• IntraOp syndesmotic stability might need to be checked.

• Care should be taken not to further displace the occult nondisplaced ankle injuries when fixate the tibial shaft fractures.

• PostOp rehab need to consider the concomitant ankle injuries in tibial shaft fractures.
Thank you !!