“Assessment Inter- and Intraobserver Agreement in Two Radiological Indexes in True Lateral X-Rays View for Syndesmotic Reduction in Ankle Fractures”

Authors: Mario Abarca M, Jorge Filippi N, Jorge Briceño F, Ignacio García M, Jaime Bernal R, Pablo Mery P y Andres Villa M.

Equipo Tobillo y Pie
Departamento de Ortopedia y Traumatología
Pontificia Universidad Católica de Chile
DISCLOSURE

“The authors have no conflicts to disclose.

“Assessment Inter- and Intraobserver Agreement in Two Radiological Indexes in True Lateral X-Rays View for Syndesmotic Reduction in Ankle Fractures”
INTRODUCTION.

- Anatomic reduction is the only predictor of good functional outcome and prevent posttraumatic arthrosis.  
  Weening B. Et al, JOT 2005

- Malreduction of distal tibio-fibular syndesmosis in ankle fractures has been reported from 20% to 52% in surgically treated patients.
  Gardner et al, Foot Ankle Int. 2006.

- Current intraoperative methods, fluoroscopy and intraoperative CT, have not improved consistently this results.
  Nielsen JH et al, CORR 2005
  Davidovitch RI et al, JBJS 2013

Images from: Grenier et al, JOT, 2013
INTRODUCTION.

- Recently have been described 2 new indexes to determine the normal anatomy of the syndesmosis in a true lateral view of the ankle to evaluate the relation of the fibula with the tibia in the sagittal plane:

- **ANTEROPosterior TibiofibuLar Ratio (APTF)** Grenier et al, JOT, 2013


True lateral view of the Ankle.

**APTF** = \( \frac{A}{B} \)
- Two points in line with physeal scar.
- 1: Anterior tibial cortical
- 2: Anterior fibular cortical

**ATFR** = \( \frac{A}{TW} \)
- TW: tibial width (Articular surface)
- A: line parallel, 1 cm above, to TW (anterior cortical of fibula and tibia)

- These studies have been made in non-injured ankles.
OBJECTIVE

- The purpose of this study is to assess intra-observer and inter-observer agreement in two radiological indexes by evaluating true lateral x-ray view in surgically treated patients for ankle fractures with syndesmotic injury.

- To our knowledge this indexes have been not tested in injured ankles.
METHODS

- Retrospective study of case series.

- Forty-three consecutive patients who underwent open reduction and internal fixation for ankle fractures with syndesmotic screw were evaluated.

- The inclusion criteria were syndesmotic injury fixed with one or two screws, and having a true lateral postoperative ankle x-ray view.

- Two measurements were performed: Anteroposterior Tibiofibular Ratio (APTF) and Anterior Tibiofibular Ratio (ATFR).

- Three independent evaluators performed the measurements, with access to images randomly.

- 2 reviews of images with an interval of at least 10 days between each measurement.

- The intra-class correlation (ICC) was used to determine inter- and intra-observer agreement, through statistical package SPSS 20.
RESULTS

Study Value APTF: 0.73 (± 0.23)

Normal Value APTF: 0.94 (± 0.13)

Grenier et al, JOT, 2013
RESULTS

Study Value ATFR: 0.43 (± 0.09)

Normal Value ATFR: 0.39 (± 0.9)

RESULTS

- Correlation ATPF Inter-observer:

  Correlation: 0.862  (IC 95% 0.760-0.922)

- Correlation ATPF Intra-observer

  Observer 1: 0.762
  Observer 2: 0.971
  Observer 3: 0.997

Table for ICC:

- <0.4 Poor
- 0.4-0.75: Regular - Good
- >0.75: Excelent

RESULTS

- Correlation ATFR Inter-observer:
  
  Correlation: 0,706  (IC 95% 0.494-0.834)

- Correlation ATFR Intra-observer:

  Observer 1: 0,774
  Observer 2: 0,810
  Observer 3: 0,990

Table for ICC:

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Description</th>
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<tbody>
<tr>
<td>-Poor: 0-0,2</td>
<td></td>
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<tr>
<td>-Low: 0,3-0,4</td>
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<tr>
<td>-Moderate: 0,5-0,6</td>
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<tr>
<td>-High: 0,7-0,8</td>
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<td>-Almost perfect: &gt;0,8</td>
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CONCLUSION

- The intra-observer and inter-observer agreement in the APTF was good to very good, with intra-class correlation values between 0.77 and 0.81.

- The reproducibility of the ATFR was also good to very good, but with lower intra-class correlation values between 0.62 and 0.79.

- Intra- and inter-observer concordance in APTF and ATFR in operated ankle fractures with syndesmotic injury was similar to that reported in healthy ankles.

- The use of these indexes could be useful in ankle fractures treated surgically with syndesmosis repair. The next step is to compare these measurements made intra-operatively with a CT scan.
REFERENCES