Wrist Arthrodesis
Clinical and Ultrasonographic Trial

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Disclosure of Interest

Nothing to Declare
"Wrist arthrodesis results in a high degree of patient satisfaction and predictable pain relief in most patients. Most patients are able to return to gainful employment, many without impairment. Successful fusion rates have been reported in the vast majority of patients overall. Activities that require forceful gripping with the hand in a fully pronated or supinated position also may be difficult to accomplish. The most common indication for a wrist arthrodesis is advanced symptomatic arthritis secondary to a degenerative, post-traumatic, inflammatory, or postinfectious condition. Various techniques have been described for achieving a successful arthrodesis. The type of operative technique used depends on the underlying condition, quality of bone, presence of bi-lateral disease, condition of the remaining joints of the involved extremity, and surgeon's preference.”

OBJECTIVES

Primary endpoint: Evaluate the functional outcomes of wrist arthrodesis in patients with advanced symptomatic inflammatory or degenerative arthritis.
METHODS

Comparative and Retrospective Study Analysis
Level of evidence: III

✓ Total Wrist Arthrodesis between 1999 and 2009;
✓ Clinical, Radiological and Ultrasonographic evaluation;
✓ SPSS Statistics Software Version 17.0 for Windows.
  ▪ Differences were deemed to be significant at p < 0.05

Exclusion Criteria:
- Tumor resections (OGCT);
- Open fracture (2nd step)
METHODS

Functional evaluation:

- Visual Analogue Scale (VAS): [1-10]

- The Disabilities of the Arm, Shoulder and Hand Score (DASH): [0-100]


- Buck-Gramcko and Lohman Score System for Wrist Arthrodesis (BGL)
  ✔ ROM of fingers and forearm;
  ✔ Functional use of the hand;
  ✔ Pain;
  ✔ Grip power;
  ✔ Subjective evaluation

**Baseline**

Population: 38 patients (7 bilaterally) → n= 45

- n= 25 Inflammatory Rheumatic Disease (IRD)
- n= 20 Remaining Cases (RC)

<table>
<thead>
<tr>
<th></th>
<th>IRD</th>
<th>RC</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Surgery)</td>
<td>49.9± 9.3</td>
<td>50.2± 18.8</td>
<td>0.948</td>
</tr>
<tr>
<td>Gender (Female)</td>
<td>n= 24 (96%)</td>
<td>n= 12 (60%)</td>
<td>0.030</td>
</tr>
<tr>
<td>Follow-up (Years)</td>
<td>6.1± 2.6</td>
<td>3.2± 1.4</td>
<td>0.000</td>
</tr>
<tr>
<td>Laterality (Right)</td>
<td>n=16 (64%)</td>
<td>n= 9 (45%)</td>
<td>0.200</td>
</tr>
<tr>
<td>Dominant Arm</td>
<td>n= 15 (60%)</td>
<td>n=13 (65%)</td>
<td>0.731</td>
</tr>
</tbody>
</table>
**BASELINE**

Surgical Indication

- **IRD**
  - 96%
  - 4%

- **Rheumatoid Arthritis**
- **Psoriatic Arthritis**
Surgical Indication

- Degenerative: 25%
- Post-Traumatic: 40%
- Kienböck Disease: 15%
- Neuromuscular D.: 20%

RC
**Baseline**

**Surgical Technique**

- **Mannerfelt**
  - IRD: 52%
  - RC: 44%
- **AO/ASIF plate**
  - IRD: 95%
  - RC: 5%
- **Colonna**
  - IRD: 4%
  - RC: 5%
# Results

## Post-Op

<table>
<thead>
<tr>
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<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone Union (Months)</td>
<td>3.3± 0.9</td>
<td>2.9± 0.8</td>
<td>0.228</td>
</tr>
<tr>
<td>Material Extraction</td>
<td>n=5 (20%)</td>
<td>n=5 (25%)</td>
<td>0.481</td>
</tr>
<tr>
<td>Postoperative complications</td>
<td>n= 3 (12%)</td>
<td>n= 2 (10%)</td>
<td>0.832</td>
</tr>
</tbody>
</table>

- **Pull Out**: n=1 (RC)
- **Pseudarthrosis**: n=1 (RC)
- **Tendon Rupture**: n=2 (IRD)
- **Tenosynovitis**: n=1 (IRD)
RESULTS

Ultrasonographic Evaluation → IRD Group

✓ Local synovitis: n=2 (8%)
  ➢ Mannerfelt: n=1
  ➢ Plate: n=1

✓ Extensor Tenosynovitis: n=2 (8%)
  ➢ Plate: n=2

16% of US alterations → All were of low intensity and without inflammatory activity identified by power-doppler signal
## RESULTS

### Functional Outcomes

<table>
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</thead>
<tbody>
<tr>
<td>Pronosupination (80-100%)</td>
<td>n=15 (60%)</td>
<td>n= 15 (75%)</td>
<td>0.204</td>
</tr>
<tr>
<td>VAS at rest</td>
<td>2.0± 0.3</td>
<td>1.5± 0.7</td>
<td>0.832</td>
</tr>
<tr>
<td>VAS in activity</td>
<td>4.0± 0.6</td>
<td>2.5± 0.3</td>
<td>0.072</td>
</tr>
<tr>
<td>DASH Score</td>
<td>22.4± 5.6</td>
<td>13.0± 6.2</td>
<td>0.153</td>
</tr>
</tbody>
</table>
RESULTS

Functional Outcomes: BGL Score System

- Excellent or Good:
  - IRD: 8 (32%)
  - RC: 15 (75%)
  - p = 0.005

- Satisfactory or Poor:
  - IRD: 17 (68%)
  - RC: 5 (25%)
RESULTS

Functional Outcomes: VAS Pre and Post-operatively

IRD


8  2

RC


6.5  1.5

p = 0.578
## Results

### Return to Work

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
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</thead>
<tbody>
<tr>
<td>IRD</td>
<td>n=14 (56%)</td>
</tr>
<tr>
<td>RC</td>
<td>n=18 (90%)</td>
</tr>
</tbody>
</table>

p = 0.013
DISCUSSION (1)

“Old Techniques” – Good Outcomes

✓ Colonna
✓ Mannerfelt

Is there a place for this procedures?
Postoperative – Cross Match

✓ n= 5/5 complications
✓ n= 3/4 US alterations
Would be **wrist arthroplasty** a better solution?

- ✓ Case selection
- ✓ Economy
- ✓ Long Term Results
- ✓ Function
CONCLUSION

✓ **IRD-US**: Low intensity and without inflammatory activity

✓ Time for bone union and post-op. complications

✓ **VAS / DASH / Pronosupination**

✓ **RC group** - Excellent or good BGL outcomes, *p*<0,05

- Higher number return to their work, *p*<0,05
**Our Message**

**Wrist arthrodesis:**

- Very effective
- Encouraging functional outcomes and pain relief levels

*Patients with and without inflammatory rheumatic disease.*
Thank you...
Save the Date

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