CORR Top 4 – Knee Day

Chancellor F. Gray, MD
September 20, 2019
#1- Does a Ceramic(ized) Bearing Improve Outcomes in Young TKA

Mark Coventry Award 2018

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The 2018 Mark Coventry, MD Award: Does a Ceramic Bearing Improve Pain, Function, Wear, or Survivorship of TKA in Patients Younger Than 55 Years of Age? A Randomized Trial

Young-Hoo Kim MD, Jang-Won Park MD, Jun-Shik Kim MD

Joint Replacement Center, Seoul, South Korea
Background

- Young patients have a high potential revision rate given increased lifetime demands on their TKA
- Ceramic(ized) bearings are more favorable for wear in biomechanics studies
- Ideal bearing for a young TKA is unknown

Questions:
- Do OxZr femora have higher PROs?
- Are there radiographic differences at mid-term follow-up?
- Is there a difference in polyethylene wear particles?
- Is there a difference in survivorship?
Methods

• 220 knees in 110 patients (one side is control for the other) all under age 55
• Randomized in the OR by computer
• Follow-up minimum 10 years
• WOMAC scores and films 3 mos, 1 year, then 3 years and at last follow-up
• Polyethylene wear analysis by synovial fluid aspiration
Average follow-up: 13 years (minimum 10)
Discussion

• No differences in any measured parameters
• Considerations:
  – Is it just too soon?
  – Are the detection modalities not sensitive enough?
Positive Alpha-defensin at Reimplantation of a Two-stage Revision Arthroplasty Is Not Associated with Infection at 1 Year

Linsen T. Samuel MD, MBA, Assem A. Sultan MD, Matthew Kheir MD, Jesus Villa MD, Preetesh Patel MD, Javad Parvizi MD, Carlos A. Higuera MD

Cleveland Clinic, Florida
Background

• Alpha-defensin well established as a diagnostic tool for PJI, but less is known about its role in determining treatment success after 2SR

• Questions:
  – 1) Can AD determine eradication based on Delphi-criteria
  – 2) How does the performance compare with the MSIS criteria
Methods

• Delphi criteria- treatment failure if:
  – Reoperation for infection
  – Death
  – Chronic wound problems or persistent pain
• 69 patients with relatively inconsistent inclusion criteria and 1 year follow-up
Results

• Sensitivity: 7% (many false negatives compared to true positives)
• Specificity: 89%
• 50% of reinfections were a different organism
Discussion

• Authors recommend against routine use of AD as marker for infection eradication
• Best diagnostic criteria to determine success still unknown!

Table 4
Comparison of Diagnostic Accuracy Among Previously Reported Tests Used to Determine Infection Eradication Following Staged Treatment of PJL.

<table>
<thead>
<tr>
<th>Study</th>
<th>Test</th>
<th>Gold Standard</th>
<th>Patients</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghanem 2009, CORR [13]</td>
<td>ESR (&gt;30 mm/h)</td>
<td>Tissue culture</td>
<td>109</td>
<td>65%</td>
<td>32.4%</td>
</tr>
<tr>
<td>Ghanem 2009, CORR [13]</td>
<td>CRP (&gt;2mg/dL)</td>
<td>Tissue culture</td>
<td>109</td>
<td>29.2%</td>
<td>72.5%</td>
</tr>
<tr>
<td>Kheir 2016, CORR [14]</td>
<td>Leukocyte Esterase (&quot;2+&quot;)</td>
<td>MSIS criteria</td>
<td>109</td>
<td>15.4%</td>
<td>92.2%</td>
</tr>
<tr>
<td>Frangiamore 2016, CORR [15]</td>
<td>IL-6</td>
<td>Delphi Criteria @ 1 y</td>
<td>32</td>
<td>0%</td>
<td>89%</td>
</tr>
<tr>
<td>Frangiamore 2016, CORR [15]</td>
<td>MSIS criteria</td>
<td>Delphi Criteria @ 1 y</td>
<td>32</td>
<td>0%</td>
<td>89%</td>
</tr>
<tr>
<td>Frangiamore 2016, CORR [15]</td>
<td>IFN-gamma</td>
<td>Delphi Criteria @ 1 y</td>
<td>32</td>
<td>75%</td>
<td>64%</td>
</tr>
<tr>
<td>Frangiamore 2016, JOA [16]</td>
<td>Alpha defensin</td>
<td>MSIS criteria</td>
<td>37</td>
<td>67%</td>
<td>97%</td>
</tr>
<tr>
<td>George 2016, CORR [24]</td>
<td>Frozen sections</td>
<td>MSIS criteria</td>
<td>79</td>
<td>50%</td>
<td>94%</td>
</tr>
<tr>
<td>Current study 2018</td>
<td>Alpha defensin</td>
<td>MSIS criteria</td>
<td>58</td>
<td>50%</td>
<td>92%</td>
</tr>
</tbody>
</table>

CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IFN, interferon; IL, interleukin; MSIS, Musculoskeletal Infectious Disease Society; PJL, prosthetic joint infection.
UF Experience

• Similar number patients, published simultaneously (JOA vs. CORR)

• Sensitivity 50%, Specificity 92%

• Negative predictive value of 96%
#3- Home Exercise vs Outpatient PT for Motion Recovery

John Insall Award 2018

2018 John N. Insall Award: Recovery of Knee Flexion With Unsupervised Home Exercise Is Not Inferior to Outpatient Physical Therapy After TKA: A Randomized Trial

Andrew N. Fleischman MD, Meredith P. Crizer BS, Majd Tarabichi MD, Shelby Smith BS, Richard H. Rothman MD, PhD, Jess H. Lonner MD, Antonia F. Chen MD, MBA

The Rothman Institute, Philadelphia
Background

• Site of therapy recognized as a primary cost driver after TKA
• Proliferation of web-based or self-directed PT programs
• Also... patients can (generally) read

• Questions:
  - 1) Can unsupervised home PT be non-inferior to formal PT
  - 2) Does a web-based platform outperform a printed manual
Methods

• 290 patients randomized to three arms:
  – Outpatient PT
  – Self-directed therapy on web-based platform
  – Self-directed therapy from printed manual
• Delayed recovery intervention if patients failing to progress
• Maximum flexion outcome of interest

• 1800 patients approached, only 290 ultimately randomized
• All patients >90 degrees of flexion, planning home discharge
Fig. 1 This is the Consolidated Standards of Reporting Trials (CONSORT) flowchart showing patient recruitment, attrition, and retention.
Results

Fig. 2 This histogram demonstrates the change in knee flexion from preoperative baseline at 4 to 6 weeks to 6 months.

Fig. 5 This figure demonstrates the change in KOOS scores from preoperative baseline.
Discussion

• For select patients, web-based or paper PT equivalent to formal outpatient PT
• Post-acute care services are the major driver of cost in TJA episode
• Limitations: selection bias?
#4- Association Between Revision Volume and Complications

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**Clinical Research**

What Is the Association Between Hospital Volume and Complications After Revision Total Joint Arthroplasty: A Large-database Study

Benjamin F. Ricciardi MD, Andrew Y. Liu MD, Bowen Qiu MD, Thomas G. Myers MD, Caroline P. Thirukumaran MBBS, MHA, PhD

University of Rochester, New York
Background

• Clear literature showing benefits of high volume centers for primary TJA outcomes
• Revision TJA more complex and risky than primary TJA

• Questions
  – 1) Are readmissions more likely at low vs. high volume revision TJA hospitals?
  – 2) Are in hospital complications more likely at low volume centers?
  – 3) Is there a difference in mortality rates depending on volume?
Methods

• Queried New York SPARCS database
  – All payers, all hospitals must submit data annually
• Included all MS-DRG 466-468
• ~25,000 patient encounters
• 138 hospitals, 929 surgeons

• 14,000 revision THAs and 11,000 revision TJAs
### Results

Table 4. Multivariate estimates examining the association between hospital volume of revision surgeries and outcomes of care

<table>
<thead>
<tr>
<th>Hospital volume quartile</th>
<th>90-day all-cause readmissions</th>
<th>90-day reoperations</th>
<th>In-hospital complications</th>
<th>90-day complications</th>
<th>30-day mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio with 95% CI</td>
<td>p value</td>
<td>Odds ratio with 95% CI</td>
<td>p value</td>
<td>Odds ratio with 95% CI</td>
</tr>
<tr>
<td>Quartile 1</td>
<td>Reference</td>
<td></td>
<td>Reference</td>
<td></td>
<td>Reference</td>
</tr>
<tr>
<td>Quartile 2</td>
<td>0.86 (0.63-1.17)</td>
<td>0.33</td>
<td>1.10 (0.51-2.40)</td>
<td>0.81</td>
<td>0.56 (0.31-1.03)</td>
</tr>
<tr>
<td>Quartile 3</td>
<td>0.91 (0.67-1.24)</td>
<td>0.56</td>
<td>1.30 (0.61-2.78)</td>
<td>0.49</td>
<td>0.50 (0.28-0.90)</td>
</tr>
<tr>
<td>Quartile 4 excluding top 5 percentile</td>
<td>0.77 (0.56-1.05)</td>
<td>0.10</td>
<td>0.99 (0.46-2.14)</td>
<td>0.98</td>
<td>0.45 (0.25-0.81)</td>
</tr>
<tr>
<td>Top 5 percentile</td>
<td>0.61* (0.43-0.88)</td>
<td>0.01</td>
<td>0.77 (0.34-1.74)</td>
<td>0.53</td>
<td>0.47 (0.25-0.91)</td>
</tr>
</tbody>
</table>

* Significant at p < 0.05
† Significant at p < 0.01
‡ Significant at p < 0.001
§ Significant at p < 0.0001
Discussion

• Should revision surgeries be regionalized to centers of excellence?
• How will that affect care access?
• Will some surgeons become revision-only specialists?
Thank You