AM E-POSTER 05: Prosthetic Arthroplasty versus Arthrodesis for Osteoarthritis and Post-Traumatic Arthritis of the Index Finger Proximal Interphalangeal Joint

Category: Arthritis
Keyword: Hand
Level 3 Evidence

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**Hypothesis:** In the surgical treatment of osteoarthritis (OA) or post-traumatic arthritis (PTA) of the index finger proximal interphalangeal joint (PIPJ) the decision to perform prosthetic arthroplasty versus joint arthrodesis remains controversial. The hypothesis was that arthrodesis would result in superior pinch strength and a lower risk of complications and reoperations compared to prosthetic arthroplasty in these patients.

**Methods:** A retrospective review was conducted comparing the outcomes of patients with primary OA or PTA of the index finger PIPJ treated with prosthetic arthroplasty or arthrodesis from 1999 to 2011. Preoperative and postoperative assessments included digit range of motion (ROM), grip and pinch strength, patient-rated pain and satisfaction scores and the Michigan Hand Questionnaire (MHQ).

**Results:** Seventy-three patients (79 index finger PIPJs – 68 with OA and 11 with PTA) were followed for an average of 62 months (SD=42 months). Sixty-five patients were treated with prosthetic arthroplasty and 14 with arthrodesis. There was no significant change in ROM in patients undergoing arthroplasty (mean=4.9º, SD=31.6º, p=0.3). There was a significant loss of ROM in patients undergoing arthrodesis (mean=-28.8º, SD=21.8º, p<0.001). Patients undergoing arthroplasty experienced improvement in only opposition pinch (mean=1.8, SD=1.1, p<0.01). There was a significant improvement in both opposition pinch (mean=1.5 kg, SD=0.9 kg, p<0.01) and apposition pinch (mean=3.1, SD=1.4, p<0.01) in those undergoing arthrodesis. There were no differences between arthroplasty and arthrodesis groups with regards to pain, satisfaction and MHQ scores. Patients undergoing arthroplasty compared to those undergoing arthrodesis had a significantly higher mean number of complications per year (mean=0.4, SD=1.1 versus mean=0.3, SD=0.7 respectively, p=0.02) and mean number of complications in the first year postoperatively (mean=1.0, SD=1.3 versus mean=0.3, SD=0.7 respectively,
p=0.02). There was a 4.3 times increased risk of complication in those undergoing arthroplasty versus arthrodesis (CI=1.4 – 13.8, p=0.01).

**Summary:** Index finger PIPJ arthroplasty provided preservation of ROM, while arthrodesis provided greater improvement pinch strength. The decision for prosthetic arthroplasty versus arthrodesis in the index finger of young, active patients with OA or PTA must be made with patient goals in mind and in light of higher risk of complications associated with prosthetic arthroplasty.

**References:**
TABLE 1. Differences in Preoperative versus Final Postoperative Values for ROM and Grip and Pinch Strengths within Groups

|                      | Arthroplasty (N=65) | Arthrodesis (N=14) |  
|----------------------|----------------------|--------------------|---
|                      | N   | Mean(SD) | *p-value | N   | Mean(SD) | *p-value | **p-value |
| Change in PIP Arc (degrees) | 49  | 4.9 (31.6) | 0.29     | 12  | -28.8 (21.8) | <0.001   | <0.001    |
| Change in Grip Strength (kg)    | 17  | 0.1 (8.7)  | 0.96     | 6   | 1.2 (1.9)  | 0.18     | 0.67      |
| Change in Opposition Pinch Strength (kg) | 8   | 1.8 (1.0)  | <0.01    | 6   | 1.5 (0.9)  | 0.01     | 0.74      |
| Change in Apposition Pinch Strength (kg) | 14  | 0.9 (2.8)  | 0.22     | 6   | 3.1 (1.4)  | <0.01    | 0.10      |

* Significance assessed using Wilcoxon signed rank test, assessment that the change within a treatment group is not equal to zero (no change)

** Significance assessed using Wilcoxon rank sum test, assessing for a difference in the change between the two groups, Arthroplasty versus Arthrodesis.

Figure 1. Kaplan-Meier survival curve in which first complication was considered the end point.

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