Introduction

- PyroCarbon hemi-arthroplasty is a proposed treatment for trapezio-metacarpal joint arthritis of the thumb.
- This procedure’s potential benefits include:
  1. Early return of range of motion
  2. Minimal post operative pain
  3. Does not eliminate the possibility of future trapeziectomy
- Previous studies have observed a high rate of subluxation, hardware loosening and trapezial fracture leading to decreased popularity of this technique.
- The author (NFJ) has previously published his technique which focuses on strong dorsal capsular reconstruction, and post operative immobilization in abduction and extension.

Methods

- Retrospective chart review (n=20)
- Inclusion criteria:
  Any patient who underwent PyroCarbon implant hemi-arthroplasty by single surgeon (NFJ)
- Minimum 2 year follow-up
- Outcomes reviewed:
  - Implant survival
  - Grip strength
  - Pinch strength
  - Range of motion
  - Pain score pre and post
  - Complications
  - Radiographic changes over time

Results

- Twenty-one procedures (12 saddle, 7 hemispheric and 2 Ascention® Nugrip™ implants)
- 17 female & 3 male patients
- Average age 66.1 ± 7.1 years
- Follow up ranged 24 – 95 months
- All patients achieved full range of motion, Kapandji score ≥ 9 (Figure 2)
- There were no surgical revisions or implant removal.
- Complications:
  - 1 patient required operative deep suture removal
  - 1 patient required steroid injection at 3 months for De Quervain’s tenosynovitis

There were no implant dislocations or infections.

Serial radiographs show no increasing lucency or significant deterioration.

Figure 1- Pre and post operative radiographs after a hemispheric PyroCarbon hemi-arthroplasty

Figure 2- Pre and post operative range of motion 3.5 years after a hemispheric PyroCarbon hemi-arthroplasty

Conclusions

- All patients had excellent return of strength and range of motion with minimal post operative pain.
- Serial radiographs showed the implants maintained position over long term follow-up.
- There were no dorsal subluxations or dislocations.
- PyroCarbon implant hemi-arthroplasty can successfully decrease pain due to CMC osteoarthritis.
- In contrast to previous reports, this group of patients all had favorable long-term results for PyroCarbon implant hemi-arthroplasty.

Table 1- Post operative patient outcomes

<table>
<thead>
<tr>
<th></th>
<th>Operative hand (n=19)</th>
<th>Contralateral hand (n=19)</th>
<th>Percentage recovered (n=20)</th>
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<tbody>
<tr>
<td>Grip strength</td>
<td>49.6 ± 20.3</td>
<td>57.2 ± 22.5</td>
<td>89.6 %</td>
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<tr>
<td>Pinch strength</td>
<td>11.2 ± 4.9</td>
<td>14.0 ± 6.1</td>
<td>79.4 %</td>
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Value presented as mean and SD