Audit of ROTO glide implant arthroplasty for Hallux Rigidus - Early results

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Introduction

- Hallux rigidus is the second most common forefoot problem
- Affects 5-40% adult population, more in men
- Degenerative or post-traumatic
- Pain, stiffness and enlargement of joint
## Coughlin and Shurnas Classification

<table>
<thead>
<tr>
<th>Grade</th>
<th>Exam Findings</th>
<th>Radiographic Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 0</td>
<td>Stiffness</td>
<td>Normal</td>
</tr>
<tr>
<td>Grade 1</td>
<td>mild pain at extremes of motion</td>
<td>mild dorsal osteophyte, normal joint space</td>
</tr>
<tr>
<td>Grade 2</td>
<td>moderate pain with range of motion increasingly more constant</td>
<td>moderate dorsal osteophyte, &lt;50% joint space narrowing</td>
</tr>
<tr>
<td>Grade 3</td>
<td>significant stiffness, pain at extreme ROM, no pain at mid-range</td>
<td>severe dorsal osteophyte, &gt;50% joint space narrowing</td>
</tr>
<tr>
<td>Grade 4</td>
<td>significant stiffness, pain at extreme ROM, pain at mid-range of motion</td>
<td>same as grade III</td>
</tr>
</tbody>
</table>

1. Initial stage with subtle changes.
2. Progression with increased bone density.
3. Advanced stage with significant bone involvement.
4. Final stage with extensive bone destruction.
Surgical Options

**Early stages**: Cheilectomy/Osteotomy

**Late stages**: Arthrodesis

More recently *joint replacement*, either hemi- or total arthroplasty is becoming an increasingly popular option for advanced disease.
Benefits of MTPJ replacement

- Pain relief
- Maintains normal anatomy
- Maintain stable soft tissue balance
- Improve ROM
Limitations of available implants

- Ceramic designs lead to osteolysis
- Sialistic leading to fractures/synovitis
- Loosening due to toggle effect
- Some prosthesis too short
- Mismatch with the contour of the joint
Issue date: November 2005

Metatarsophalangeal joint replacement of the hallux

Understanding NICE guidance – information for people considering the procedure, and for the public
More studies are needed that look at how long the different types of artificial joint last, and what happens in people who’ve had them in place for a long time.
ROTO-glide

- First launched in 1999 in Denmark and used in the UK from 2002 onwards.

- The design which was developed in UK has remained unchanged since 2000.
ROTO-glide components
Rotoglide TRIAL

• Part of national trial performed at 4 centers in UK.

• Mr. Limaye part of the national trial

• Study started at South Tees, being currently reviewed at Oswestry.

• This study is due for presentation at BOFAS this year
South Tees Study

• Prospective study between January 2013 – May 2014

• 20 patients (24 feet) with average follow up 18.9 months
Functional Outcomes

- **VAS**
  - Pre-op: 9.9
  - Post-op: 4.05

- **AOFAS**
  - Pre-op: 30.8
  - Post-op: 82.3

- **Dorsiflexion (degrees)**
  - Pre-op: 15
  - Post-op: 20

- **Plantarflexion (degrees)**
  - Pre-op: 30
  - Post-op: 35
North Tees Experience

- Prospective study between May 2014 – May 2015
- 9 patients (10 feet)
- 2 males and 7 females
- Average age 61 years (58-66 years)
Inclusion Criteria

- Stage II & stage III Hallux Rigidus
- Failure of non operative treatment
- Patients over 40 years, not keen on fusion
- Non Inflammatory arthritis
Exclusion criteria

• DM
• Vascular compromise
• Multiple co-morbidities
• Hallux valgus
• Very stiff toe (Stage 4)
• Inflammatory arthritis
Assessment tools

Pre- & Post-operative:

• Clinical examination (including ROM)
• AOFAS scores
• X-Rays (standing)
• Post-op reviews at 3, 6 & 12 months
# AOFAS - 100 points

## Hallux Metatarsophalangeal-Interphalangeal Scale

<table>
<thead>
<tr>
<th>Pain (40 points)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>40</td>
</tr>
<tr>
<td>Mild, occasional</td>
<td>30</td>
</tr>
<tr>
<td>Moderate, daily</td>
<td>20</td>
</tr>
<tr>
<td>Severe, almost always present</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function (45 points)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity limitations</strong></td>
<td></td>
</tr>
<tr>
<td>No limitations</td>
<td>10</td>
</tr>
<tr>
<td>No limitation of daily activities, such as employment</td>
<td>7</td>
</tr>
<tr>
<td>Limited daily and recreational activities</td>
<td>4</td>
</tr>
<tr>
<td>Severe limitation of daily and recreational activities</td>
<td>0</td>
</tr>
</tbody>
</table>

| **Footwear requirements**             |         |
| Fashionable, conventional shoes, no insert required | 5       |
| Comfort footwear, shoe insert         | 3       |
| Modified shoes or brace              | 0       |

| **MTP joint motion (dorsiflexion plus plantarflexion)** |         |
| Normal or mild restriction (75° or more) | 10      |
| Moderate restriction (30°-74°)           | 5       |
| Severe restriction (less than 30°)       | 0       |

| **IP joint motion (plantarflexion)**   |         |
| No restriction                         | 5       |
| Severe restriction (less than 10°)     | 0       |

| **MTP-IP stability (all directions)**  |         |
| Stable                                | 5       |
| Definitely unstable or able to dislocate | 0       |

| **Callus related to hallux MTP-IP**   |         |
| No callus or asymptomatic callus      | 5       |
| Callus, symptomatic                   | 0       |

| **Alignment (15 points)**             |         |
| Good, hallux well aligned             | 15      |
| Fair, some degree of hallux malignment observed, no symptoms | 8       |
| Poor, obvious symptomatic malalignment | 0       |

**Total** = 100
Our standard- Erkocak et al
Foot and ankle Int Nov 2013

• 24 patients

• 29.9 months follow up

• Retrospective series
Our results

- Mean follow up: 6 months (1 ½ - 12)

- Mean pre-op range of motion:
  - 15° Dorsiflexion
  - 30° Plantarflexion

- Stiffness - 1

- Total revisions to arthrodesis - None
AOFAS SCORES

- **PREOP-AOFAS**
  - Standard: 42.77
  - Our Series: 44.77

- **POSTOP-AOFAS**
  - Standard: 88.5
  - Our Series: 83.25
VAS-SCORES

<table>
<thead>
<tr>
<th></th>
<th>STANDARD</th>
<th>OUR SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREOP-VAS</td>
<td>7.4</td>
<td>9.9</td>
</tr>
<tr>
<td>POSTOP-VAS</td>
<td>1.9</td>
<td>4.05</td>
</tr>
</tbody>
</table>
Pre & Post-op X-rays
Post-op X-rays
Post-op X-rays
1 year follow up
Future audit loop

- Longer follow up
- Working towards publications
- Early ROM on the day of surgery
NICE guidelines

• Careful patient selection

• Patient understanding what is involved

• Results to be monitored
Conclusion

• MTPJ replacement is gaining popularity
• Our results match with the national guidelines
• Provides pain relief with maintaining ROM
• Very effective option in the management of hallux rigidus
Thank you