Total Ankle Replacement

Victor Valderrabano

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SWISS ORTHO CENTER
### TAR Classification

<table>
<thead>
<tr>
<th>6 factors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Fixation</td>
<td>cemented, uncemented</td>
</tr>
<tr>
<td>- Number of components</td>
<td>2, 3</td>
</tr>
<tr>
<td>- Constraint</td>
<td>yes, semi, no</td>
</tr>
<tr>
<td>- Congruency</td>
<td>yes, no</td>
</tr>
<tr>
<td>- Components shape</td>
<td>anatomical, not anatomical</td>
</tr>
<tr>
<td>- Bearing</td>
<td>fixed, mobile</td>
</tr>
</tbody>
</table>
Modern TAR Designs
VANTAGE - Total Ankle Replacement

VANTAGE
by Exactech

FDA Approved
CE in progress

Prof. James Nunley
Prof. Mark Easley
Prof. James DeOrio
Prof. Victor Valderrabano
VANTAGE - Rational

Reduce Known Complications:

- Implant subsidence
- Implant loosening
- Bone cysts around implants
- Instability
- Pain during activity
- Polyethylene revision
Mimicking anatomy:

Approximately 2mm collapse of talus in diseased morphology

Talar height measurements

Healthy talus curvature

Diseased talus curvature
Mimicking anatomy:

- No curvature posterior of fibula to avoid impingement
- Span A/P cortex with minimal overhang
VANTAGE - Rational

Fixation – Talar component

- 2 pegs for Press-Fit Stability
VANTAGE - Rational

Fixation – Tibial component

- Vertical Cage Press-Fits for initial fixation
- Peripheral Pegs for Rotational Stability
- Cage holes to encourage through-growth for long-term stability

Pegs and cage plasma coated

Cage through-growth
VANTAGE - Rational

Tibial Stress Shielding:
Reduce stress shielding to prevent cysts
VANTAGE - Rational

Polyethylene Wear:

**Improved Polyethylene**

Fracture Toughness and Wear Performance

- Bicondylar implant is less susceptible to edge loading
- Net compression molded surfaces have lower roughness to reduce wear
- Process to manufacture the polyethylene maintains fracture toughness.

<table>
<thead>
<tr>
<th>Design</th>
<th>Average Wear Rate</th>
<th>Standard Deviation</th>
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<tbody>
<tr>
<td>Comparable Ankles</td>
<td>7.33 mg/MC</td>
<td>0.46 mg/MC</td>
</tr>
<tr>
<td>Exactech VANTAGE</td>
<td>5.63 mg/MC</td>
<td>0.54 mg/MC</td>
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</table>

Comparison of Wear Performance:

- **Comparable Ankles**: 7.33 mg/MC (0.46 mg/MC)
- **VANTAGE**: 5.63 mg/MC (0.54 mg/MC)

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**STAR**

**VANTAGE**
VANTAGE - Rational

3-component & 2-component implantation:
VANTAGE - Cases
67 F, left ankle pain fibula fracture and fracture around her knee secondary to an MVA in the 1960's.
67 F, left ankle pain fibula fracture and fracture around her knee secondary to an MVA in the 1960's

Courtesy Prof. James De Orio
VANTAGE - Cases

Patient –
K.S.

Courtesy Prof. James De Orio
VANTAGE - Cases

Patient – K.S.  Courtesy Prof. James De Orio
Thank You!

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