The cost and time effectiveness of osseointegration compared to the traditional socket prosthesis

Research Team

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Why does my research matter?

- Over 6500 amputees registered with QALS
- 3890 are active and receiving regular services
- 120-130 new amputees per annum
Traditional Socket Prosthesis

Impact on daily living

- Heat/sweating (72%)
- Sore/skin irritation (62%)
- Inability to walk quickly (59%)
- Stump pain (51%)
- Phantom limb pain (48%)
- Lower back pain (47%)

(Hagberg & Branemark, 2001)
Osseointegration (OI)

Stage 1

• Skin and adipose tissue removed
• Muscle group rearranged to improve functionality
• Bone residuum is reshaped
• Internal component of the implant inserted
• Address any neuroma and nerve pain
• Implant is closed in layers

OI - Stage 2

Stage 2 (6-8wks post op)

- Opening the stoma
- Dual cone adaptor connected to internal stem
- Remaining components attached externally
- Start partial weight-bearing

Socket vs Osseointegration

Osseointegration significant improvements

- Walking
- Quality of life
- Increase use of prosthesis
- Walking 44% faster
- Reduced oxygen consumption during treadmill walking

(Van de Meent H et al, 2013)
Aim

• the aim of this project was to compare the differences in mean cost of services, cost of componentry and labour hours when using osseointegration compared to traditional socket-based prostheses.
Methods

• Ethical Approval USC (A/13/505)
• Retrospective data collection (QALS)
• Data collection variables:
  – cost of service,
  – labour hours,
  – cost of componentry
Participants

• n = 5 Trans Femoral Amputees
• QALS clients who have used both OI and Socket prosthesis
• Age 46.4 ± 10.1yrs
• Height 175.4 ± 16.3cm
• Mass 87.8 ± 14.0kg
• Time since stage 2: 22.0 ± 8.1mths
## Results

<table>
<thead>
<tr>
<th>Participants</th>
<th>Labour (hrs)*</th>
<th>Service Cost ($)*</th>
<th>Componentry ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Socket</td>
<td>OI</td>
<td>Socket</td>
</tr>
<tr>
<td>1</td>
<td>6.39</td>
<td>3.25</td>
<td>617.52</td>
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<tr>
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<td>5.96</td>
<td>1.03</td>
<td>751.99</td>
</tr>
<tr>
<td><strong>Means ± SD</strong></td>
<td><strong>13.3 ± 6.6</strong></td>
<td><strong>2.1 ± 0.9</strong></td>
<td><strong>1371.8 ± 121.9</strong></td>
</tr>
</tbody>
</table>

*significant differences p < 0.05
Pilot Outcome

• Significantly fewer visits to the prosthesis
• Componentry cost are similar due to the more advanced prosthetic components
• Comparable results to Haggstrom et al. (2012)
References