Is there a place for focal femoral condyle resurfacing?

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INTRODUCTION

Focal femoral resurfacing fills the gap between arthroscopic repair and knee arthroplasty.

Is it a good option for treating osteochondral defects?
Indications - **LIMITED**

- Cartilage lesion that have failed prior therapy 
  (conservative or surgical)
- Symptomatic lesions classified as ICRS grade 2, 3, or 4
- Lesion size may not exceed 3.1 cm² and must be circumscribed by a 15 mm or 20 mm circle of normal or nearly normal (ICRS Grade 0 or 1) cartilage, with an overall depth less than 4 mm from the articulating surface
- Subchondral bone quality sufficient to support the implant
- Understanding and willingness to comply with the post-operative rehabilitation instructions and follow-up visits
- Age 21 years and older
Indications - **LIMITED**

**DIAMETER = SURFACE**

15mm = 1.77 mm²  
20mm = 3.14 mm²
CONTRAINDICATIONS

- Body mass index (BMI) ≥ 35
- Generalized degenerative or autoimmune arthritis
- Gout
- Uncorrected chronic malalignment of the patella
- Uncorrected ligamentous instability
- Kissing lesion on tibia
- More than one implant required to accommodate lesion
- Allergy (cobalt, chromium, molybdenum, titanium)
PROPOSED ALGORITHM

surgery

<35 years

35-65 years

>65 years

„biology“

focal prosthetic resurfacing

TKA

UKA

→ Prosthetic inlay resurfacing for the treatment of focal, full thickness cartilage defects of the femoral condyle: a bridge between biologics and conventional arthroplasty - Peter Bollars • Marc Bosquet • Bruno Vandekerckhove • Francois Hardeman • Johan Bellemans
### Operative Treatment of Articular Cartilage Lesions

<table>
<thead>
<tr>
<th>LESION SIZE</th>
<th>OPERATIVE TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1.0 cm</td>
<td>Observation, Abrasion chondroplasty, Microfracture, Osteochondral autograft transfer</td>
</tr>
<tr>
<td>1.0-2.0 cm</td>
<td>Abrasion chondroplasty, Microfracture, Osteochondral autograft transfer</td>
</tr>
<tr>
<td>2.0-3.5 cm</td>
<td>Fresh osteochondral allograft, Autologous chondrocyte implantation</td>
</tr>
<tr>
<td>3.5-10 cm</td>
<td>Autologous chondrocyte implantation</td>
</tr>
<tr>
<td>Multiple (2 or 3)</td>
<td>Autologous chondrocyte implantation</td>
</tr>
</tbody>
</table>

"The consensus among UK clinicians is that ACI is the only effective treatment option for defects that are over 2cm² when symptoms persist after nonsurgical management."
SURGICAL TECHNIQUE
Surgical Technique
• 90% to 217% increase in peak contact pressure for 1mm proud implant
• Conclusion: slightly recessed implantation
PITFALL – **SURGICAL** TECHNIQUE and **KISS** LESION

**untreated**  
**flush**  
**1 mm proud**  
**defect**

**PEAK CONTACT PRESSURE @ 15° KNEE FLEXION**
AVAILABILITY

NOT yet available in United States

still under review by FDA

ClinicalTrials.gov

Follow-up of ArthroSurface HemiCAP Implants
Focal articular prosthetic resurfacing for the treatment of full-thickness articular cartilage defects in the knee: 12-year follow-up of two cases and review of the literature

C. Becher1 · E. Friberg2 · E. Olsson1 · L. Fredriksson2

Treatment of full-thickness cartilage lesions and early OA using large condyle resurfacing prosthesis: UniCAP

Jens Ole Laursen1

Prosthetic inlay resurfacing for the treatment of focal, full thickness cartilage defects of the knee: a comparison between biologics and conventional treatments

Peter Bollars · Marc Bosquet · Bruno Vandekerckhove · François Hardeman · Johan Bellemans

A848. EARLY CLINICAL EVALUATION OF A CONTOURED FOCAL RESURFACING PROSTHESIS SYSTEM (HEMICAP®) IN UK PATIENTS


Published 19 October 2011
Prosthetic inlay resurfacing for the treatment of focal, full thickness cartilage defects of the femoral condyle: a bridge between biologics and conventional arthroplasty

Peter Bullars · Marc Bosquet · Bruno Vandekerckhove · François Hardeman · Johan Bellemans

» 19 cases

» Knee Score 42% change compared to pre-operative scores

» soft tissues and bone stock are preserved providing a delayed strategy for traditional arthroplasty
Treatment of full-thickness cartilage lesions and early OA using large condyle resurfacing prosthesis: UniCAP®

Jens Ole Laursen

- study group: 64 patients
- level of evidence IV (case series)
- **HIGH CONVERSION TO ARTHROPLASTY RATE - 47%** (7 year follow-up)
- **CONCLUSION**: temporary solution for younger patients
Focal articular prosthetic resurfacing for the treatment of full-thickness articular cartilage defects in the knee: 12-year follow-up of two cases and review of the literature

C. Becher¹ · E. B. Cantiler¹

» analysis of 2 cases and 169 in reviewed studies

» The results suggest that focal articular prosthetic resurfacing is an effective and safe treatment option in selected cases.
CONCLUSION: The present study demonstrated an improved subjective outcome and reduced pain after femoral resurfacing using the UniCAP (®) implant in a relatively large cohort of patients with symptomatic large cartilage lesions or early OA. A 47 % reoperation rate with conversion to arthroplasty was found. Femoral resurfacing implantation can be a temporary treatment for large cartilage lesions or early OA that is expected to develop into osteoarthritis. For younger patients who are ineligible for arthroplasty treatment, this implant can offer a temporary solution.

LEVEL OF EVIDENCE: IV.

Conclusion  The present study demonstrated improved subjective outcome and reduced pain after femoral resurfacing using the HemiCAP implant in a relatively large cohort of patients with symptomatic cartilage lesions. A concerning 23 % reoperation rate with conversion to arthroplasty was found. Femoral resurfacing implantation treatment can be a temporary treatment for cartilage lesions expected to develop into osteoarthritis and for younger patients not eligible for arthroplasty treatment.

Level of evidence  IV.
AUSTRALIAN REGISTRY

» 238 in the registry (0.4%)

» hemicap type implants

» mean age: 50.4 y

» males: 50.8%

The cumulative percent revision of partial resurfacing procedures undertaken for osteoarthritis is 38.7% at nine years.
AUSTRALIAN REGISTRY

% |
---|
70 |
60 |
50 |
40 |
30 |
20 |
10 |
0  |

PROGRESSION | LOOSENING | PAIN | OTHER
---|---|---|---
60% | 10% | 5% | 25%
AUSTRALIAN REGISTRY

CUMULATIVE % REVISION

POST-OP

NATIONAL JOINT REPLACEMENT REGISTRY
Hip, Knee & Shoulder Arthroplasty

ANNUAL REPORT 2017

AUSTRALIAN ORTHOPAEDIC ASSOCIATION
OUR MATERIAL

» our material comprises of 4 patients operated in 2015

» indication: focal cartilage lesion on medial femoral condyle

» 2 males, 2 females

» age: avg. 46 (42-52)

» in 1 case: subsequent ACL reconstruction

» in 1 case: UNICAP prosthesis

» 2 year follow up
## OUR MATERIAL | 2 year follow up

<table>
<thead>
<tr>
<th>Implant</th>
<th>PAIN VAS</th>
<th>Revision</th>
<th>Loosening</th>
<th>Infection</th>
<th>Kissing lesion</th>
<th>Would recommend</th>
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<td></td>
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<td>NO</td>
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<td></td>
<td>CONSTANT</td>
<td>YES (Oxford)</td>
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<td>NO</td>
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<td>NO</td>
<td>NO</td>
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</tr>
<tr>
<td>UNICAP</td>
<td>DECREASE</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
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<td>YES</td>
</tr>
</tbody>
</table>
REVISION CASE

POST-OP

1 YEAR
FORTUNATELY REVISION IS EASY
FORTUNATELY REVISION IS EASY
NEW IMPLANTS

» new generation of implants

» hydrophilic composite material

(hyaluronic acid + UHMWP)

» titanium stem

» claims to be better

» less stiffness

» even less evidence

» multicenter trials in UK
NEW IMPLANTS | BIOMECHANICS

Pressure mapping looking at metal implant on tibial cartilage contact pressures, peak 7.24MPa, active contact zone loaded area - 314mm² and BioPoly implant on tibial cartilage contact pressures, peak 5.46MPa, active contact zone loaded area - 471mm².

2015 ICRS Convention Abstract
19.3.3 - Focal Knee Resurfacings – Filling the void between biological resurfacing and arthroplasty. [5.756]
Presented May 10, 2015
Paul Jezewski (Canada), United Kingdom; Matthew Yablo (Liverpool, United Kingdom); Michael J. McNicholas (Liverpool, United Kingdom)
NEW IMPLANTS

Partial Resurfacing of the Femur
Posterupt Report at 2 Years

» 33 patients
» 2 year follow up
» significant and meaningful improvement in comparison with preoperative function
» 1 revision
CONCLUSION

RESURFACING CAN BE AN GOOD OPTION IN KNEE SURGERY

HOWEVER

LIMITED

TEMPORARY

REQUIRES FURTHER STUDIES