Is there a place for focal femoral condyle resurfacing?

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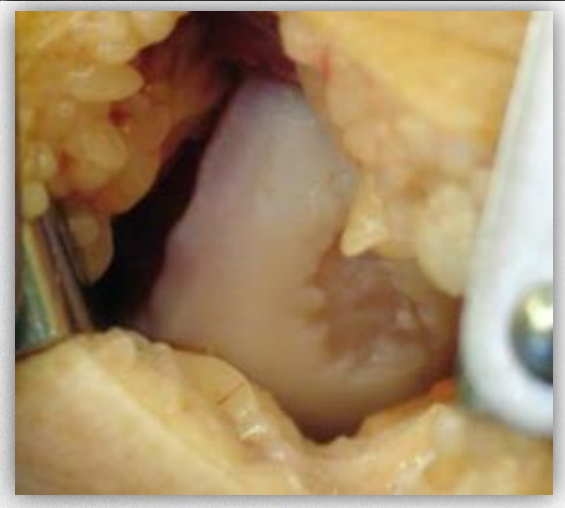
INTRODUCTION

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

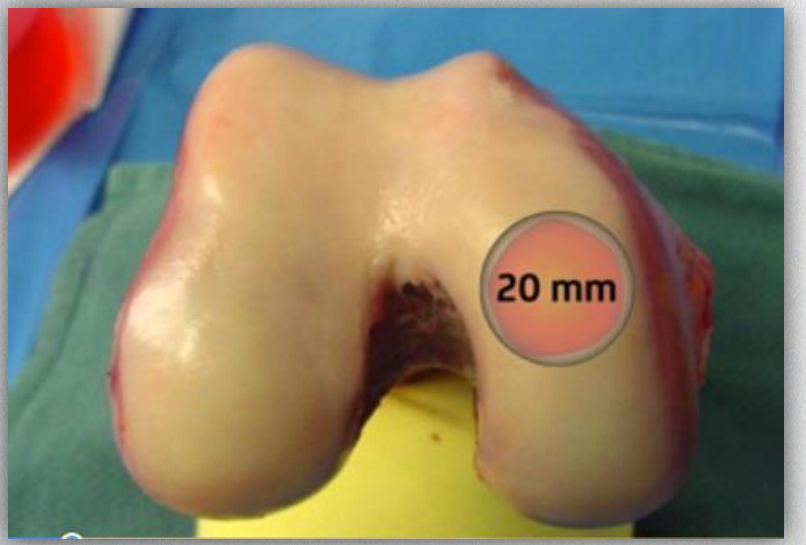
Is it a good option for treating osteochondral defects?

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 cm^2 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**

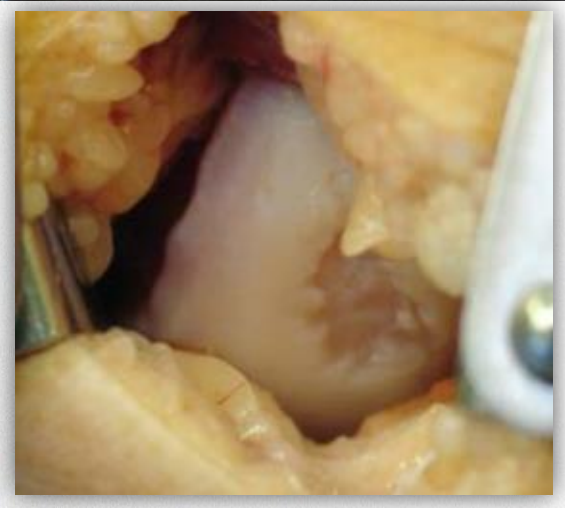


DIAMETER = SURFACE

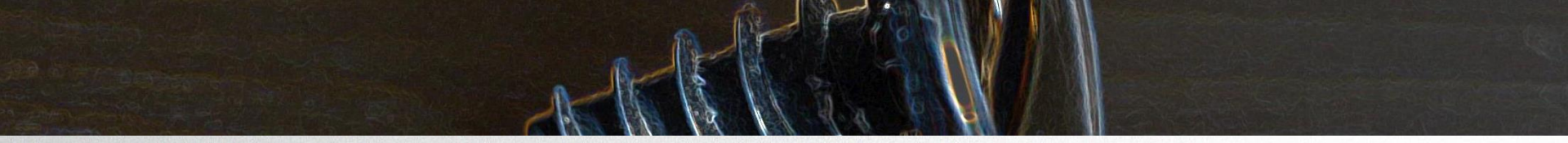
15mm = 1.77 mm^2

20mm = 3.14 mm^2

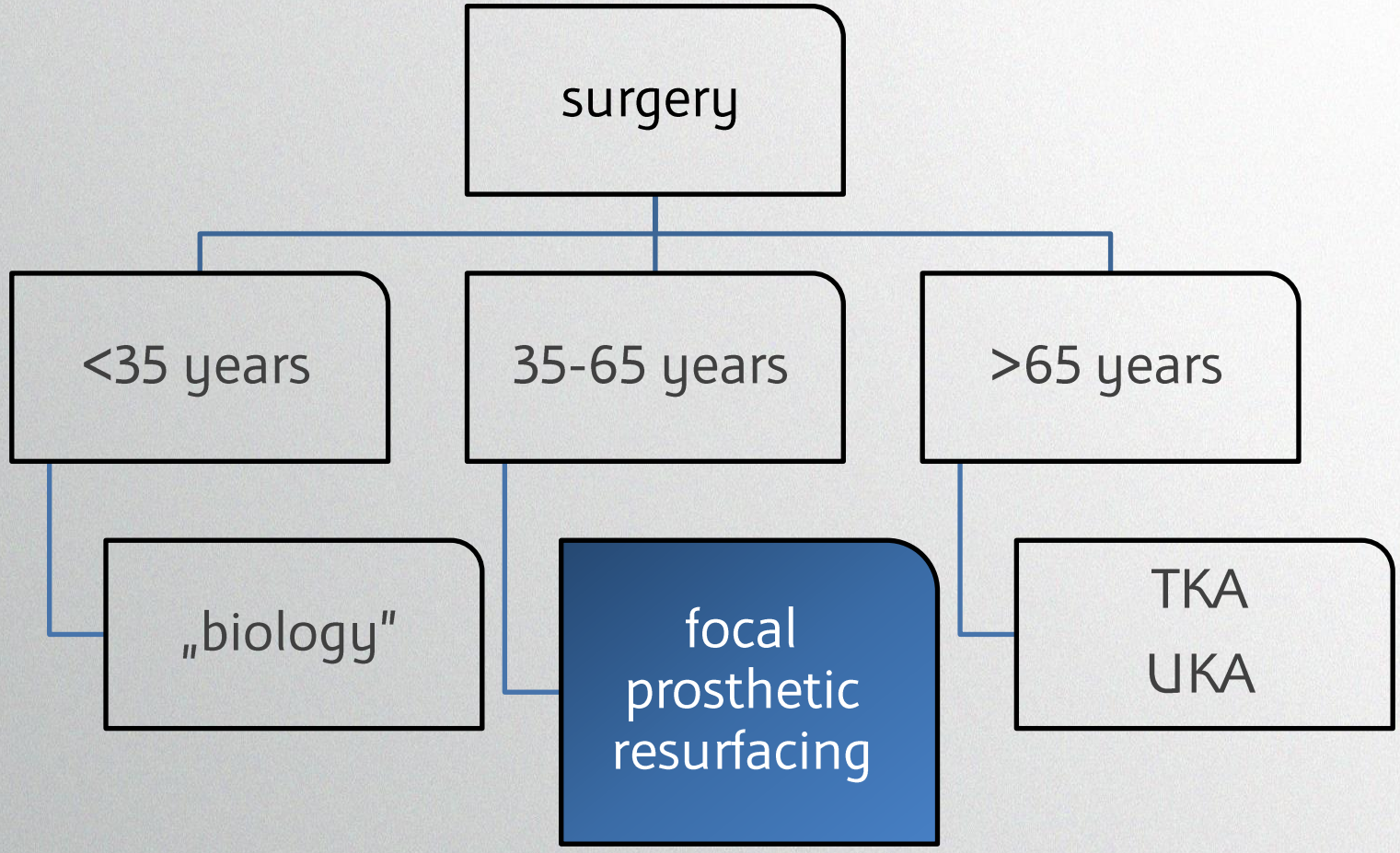
CONTRAINDICATIONS



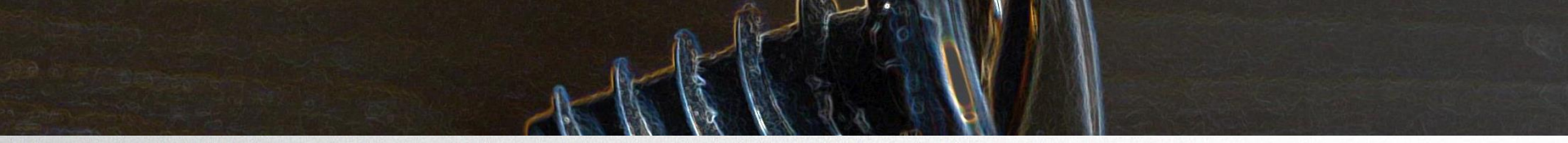
- Body mass index (BMI) ≥ 35
- Generalized degenerative or autoimmune arthritis
- Gout
- Uncorrected chronic malalignment of the patella
- Uncorrected ligamentous instability
- Kissing lesion on tibia
- More than one implant required to accommodate lesion
- Allergy (cobalt, chromium, molybdenum, titanium)



PROPOSED **ALGORITHM**



→ 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



GUIDELINES

AAOS American Academy of Orthopaedic Surgeons
American Association of Orthopaedic Surgeons

TABLE 45-7 Operative Treatment of Articular Cartilage Lesions

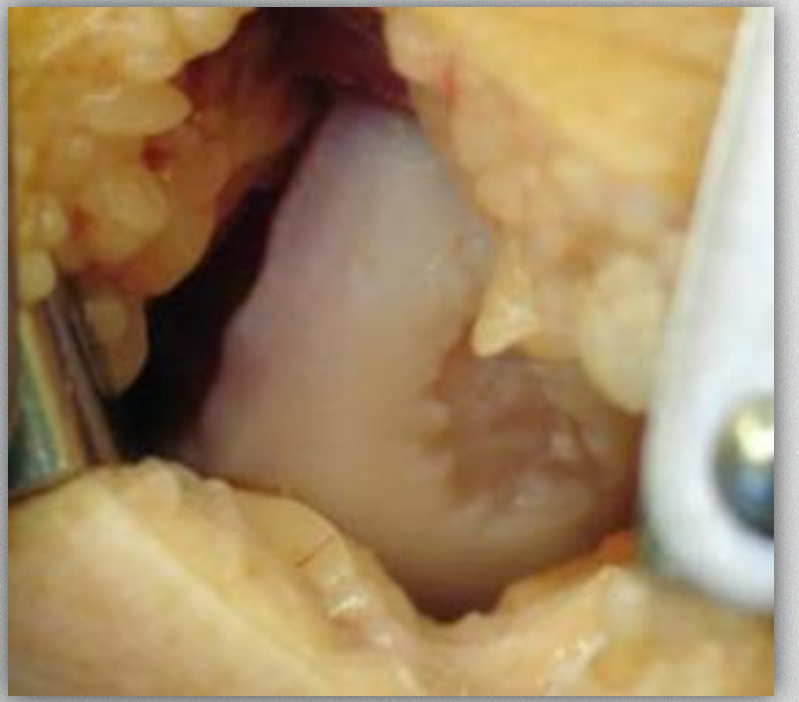
LESION SIZE	OPERATIVE TREATMENT
≤1.0 cm	Observation Abrasion chondroplasty Microfracture Osteochondral autograft transfer
1.0-2.0 cm	Abrasion chondroplasty Microfracture Osteochondral autograft transfer
2.0-3.5 cm	Fresh osteochondral allograft Autologous chondrocyte implantation
3.5-10 cm	Autologous chondrocyte implantation
Multiple (2 or 3)	Autologous chondrocyte implantation

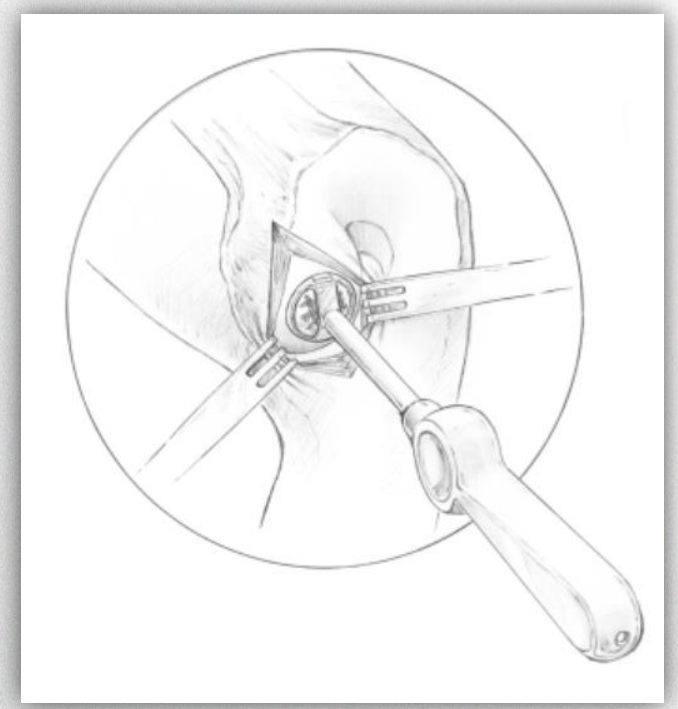
Campbell's Operative Orthopaedics, 13th Edition

NICE National Institute for Health and Care Excellence

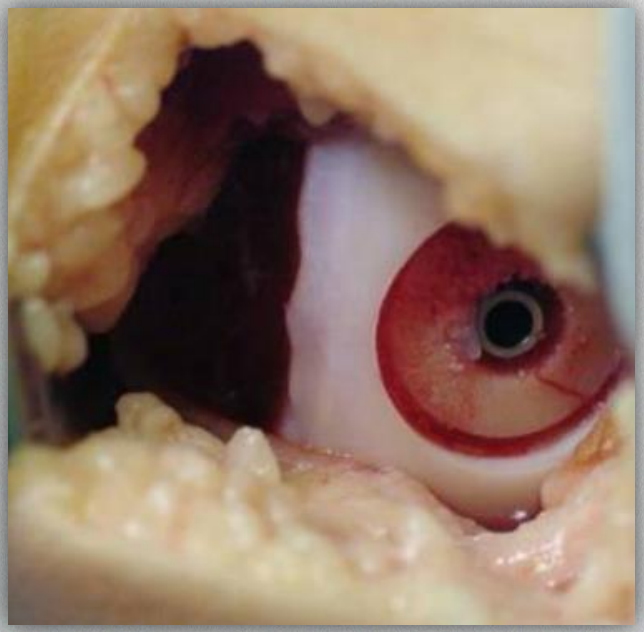
„The consensus among UK clinicians is that ACI is the only effective treatment option for defects that are over 2cm^2 when symptoms persist after non-surgical management."

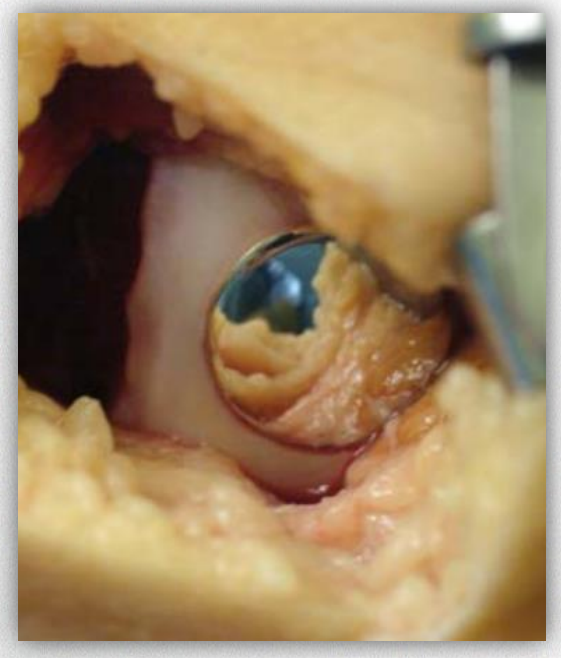
SURGICAL **TECHNIQUE**





SURGICAL **TECHNIQUE**





PITFALL – **SURGICAL** TECHNIQUE and **KISS** LESION

Knee Surg Sports Traumatol Arthrosc (2008) 16:56–63
DOI 10.1007/s00167-007-0416-7

KNEE

Effects of a contoured articular prosthetic device on tibiofemoral peak contact pressure: a biomechanical study

Christoph Becher · Roland Huber · Hajo Thermann · Hans H. Paessler · Gobert Skrbensky

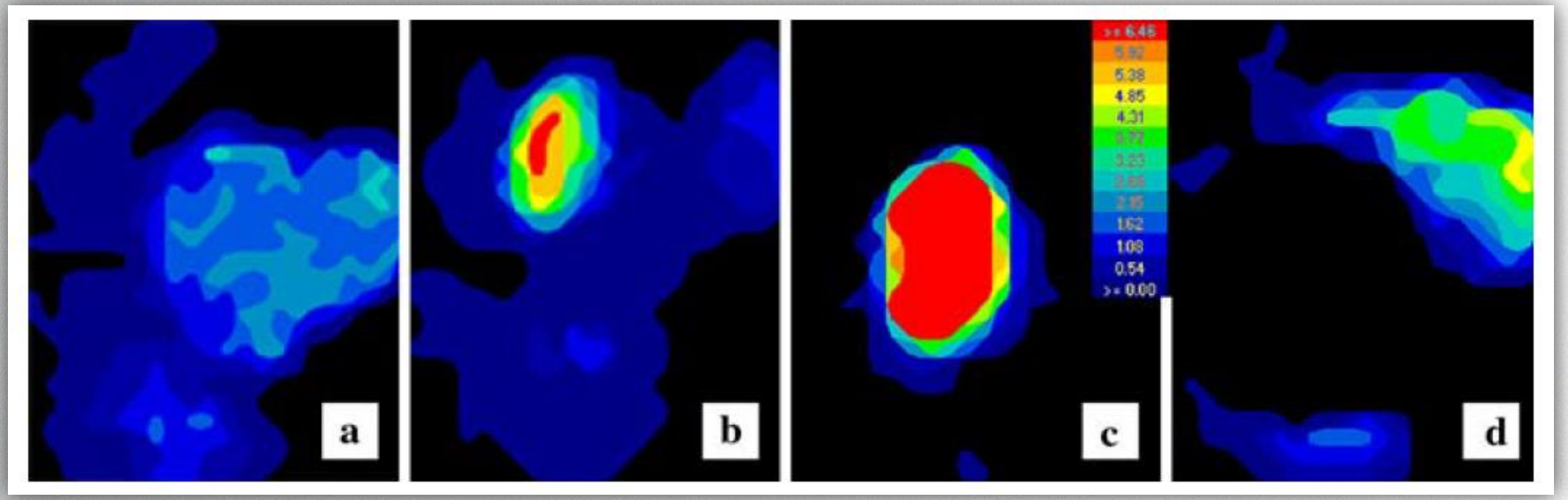
OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

Focal knee resurfacing and effects of surgical precision on opposing cartilage. A pilot study on 12 sheep

N. Martinez-Carranza †‡*, H.E. Berg †‡, K. Hultenby §, H. Nurmi-Sandh ‖, L. Ryd †‡, A.-S. Lagerstedt ‖

- 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

NIH U.S. National Library of Medicine

ClinicalTrials.gov

Home > Study Record Detail

Follow-up of Arthrosurface HemiCAP Implants

NOT yet available in United States

still under review by FDA

FEW QUALITY PAPERS

Arch Orthop Trauma Surg
DOI 10.1007/s00402-017-2717-8

KNEE ARTHROPLASTY

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. Becher[1] · E. B

Knee Surg Sports Traumatol Arthrosc (2016) 24:1695–1701
DOI 10.1007/s00167-016-4000-x

KNEE

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

Jens Ole Laursen[1]

Knee Surg Sports Traumatol Arthrosc
DOI 10.1007/s00167-011-1757-9

KNEE

Prosthetic inlay resurfacing for the treatment of focal, full thickness cartilage defects of the between biologics and conventio

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

Orthopaedic Proceedings

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

K. I. Eleftheriou, N. Ali, R. Thakrar, H. V. Parmar
Published 19 October 2011

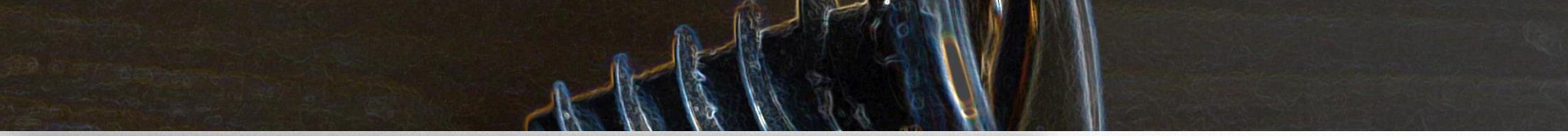
Knee Surg Sports Traumatol Arthrosc
DOI 10.1007/s00167-011-1757-9

KNEE

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 · 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 arthtroplasty



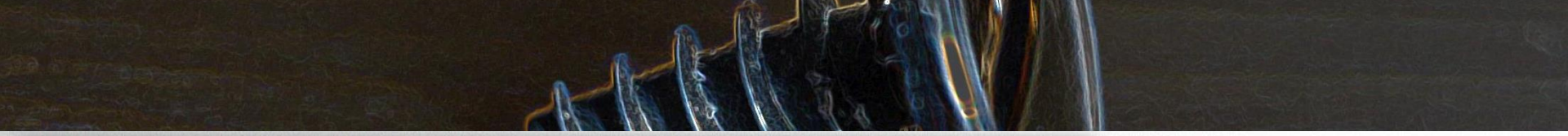
Knee Surg Sports Traumatol Arthrosc (2016) 24:1695–1701
DOI 10.1007/s00167-016-4000-x

KNEE

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

Jens Ole Laursen[1]

- 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**



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DOI 10.1007/s00402-017-2717-8

KNEE ARTHROPLASTY

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. Becher[1] · E. B. Cantiller[1]

- 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.

VERY FEW QUALITY PAPERS

CONCERNING VERY HIGH REOPERATION RATE

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. The 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.

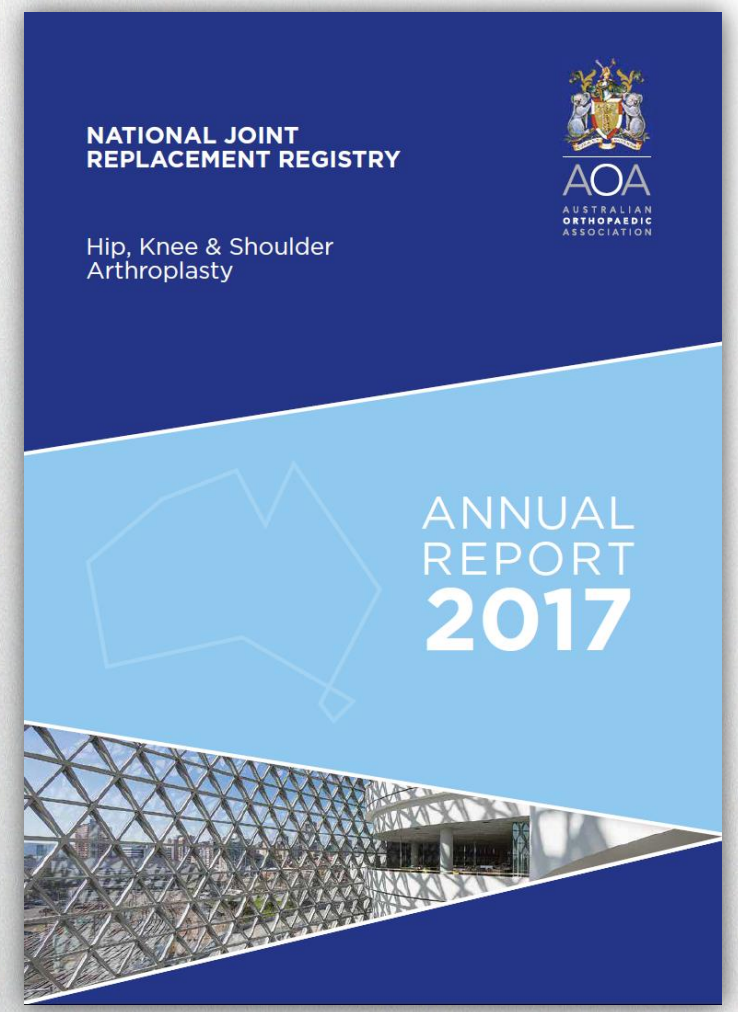
LEVEL OF EVIDENCE: IV.

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.

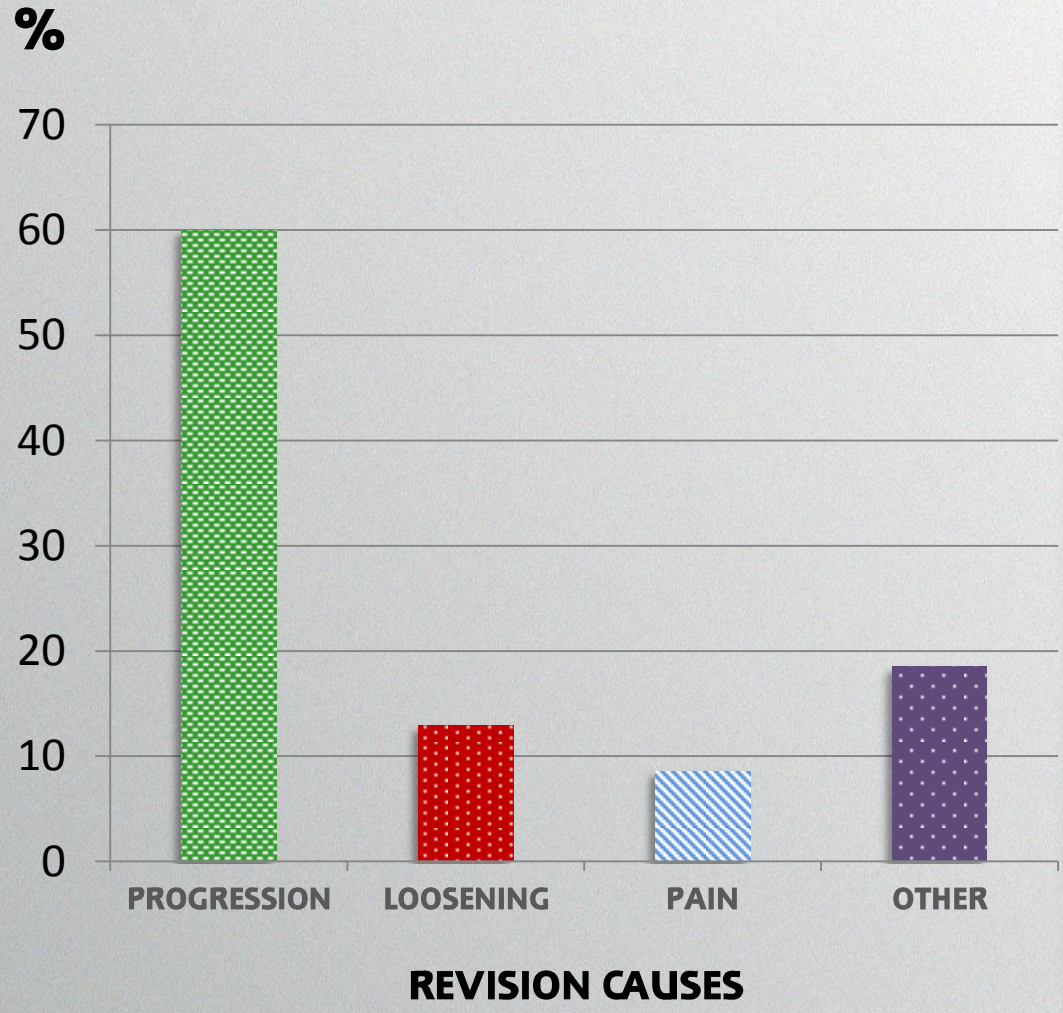
AUSTRALIAN REGISTRY

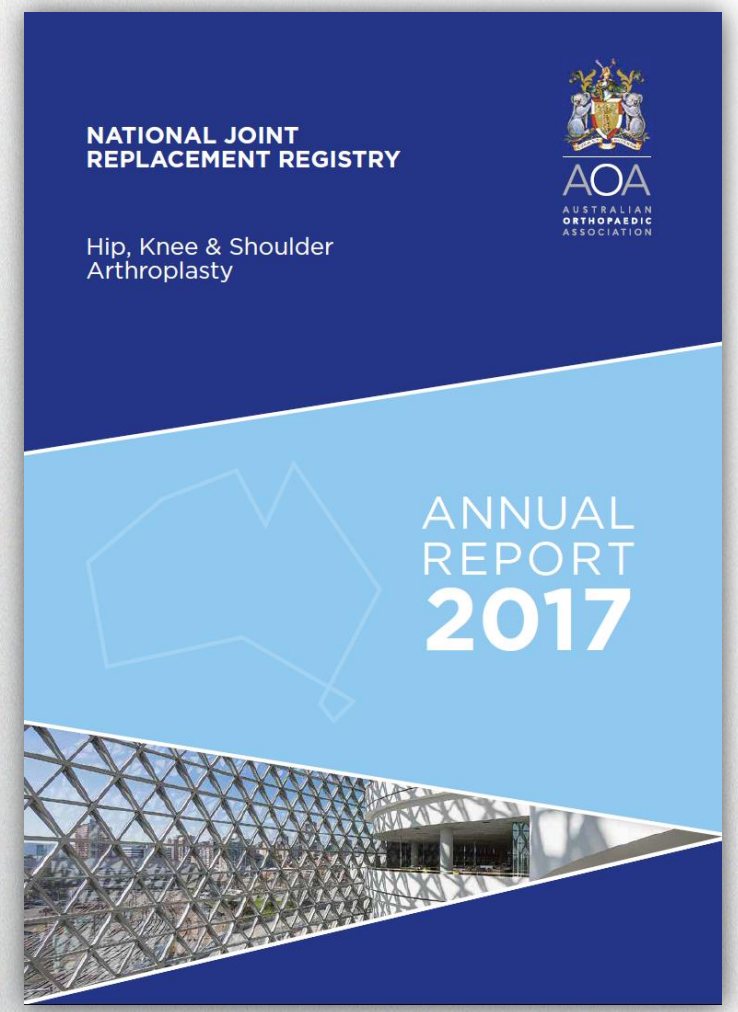
- 238 in the registry (0.4%)
- hemicap type implants
- mean age: 50.4 y
- males: 50.8%

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

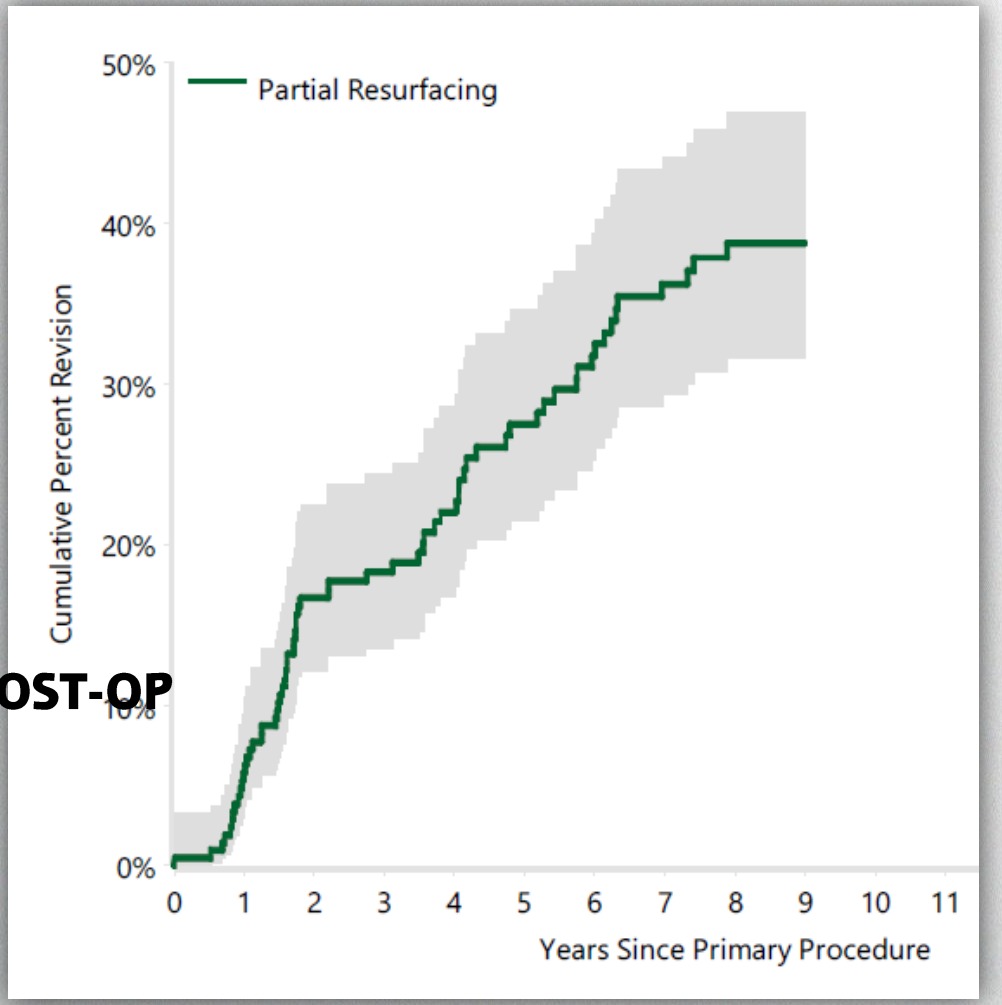


AUSTRALIAN REGISTRY



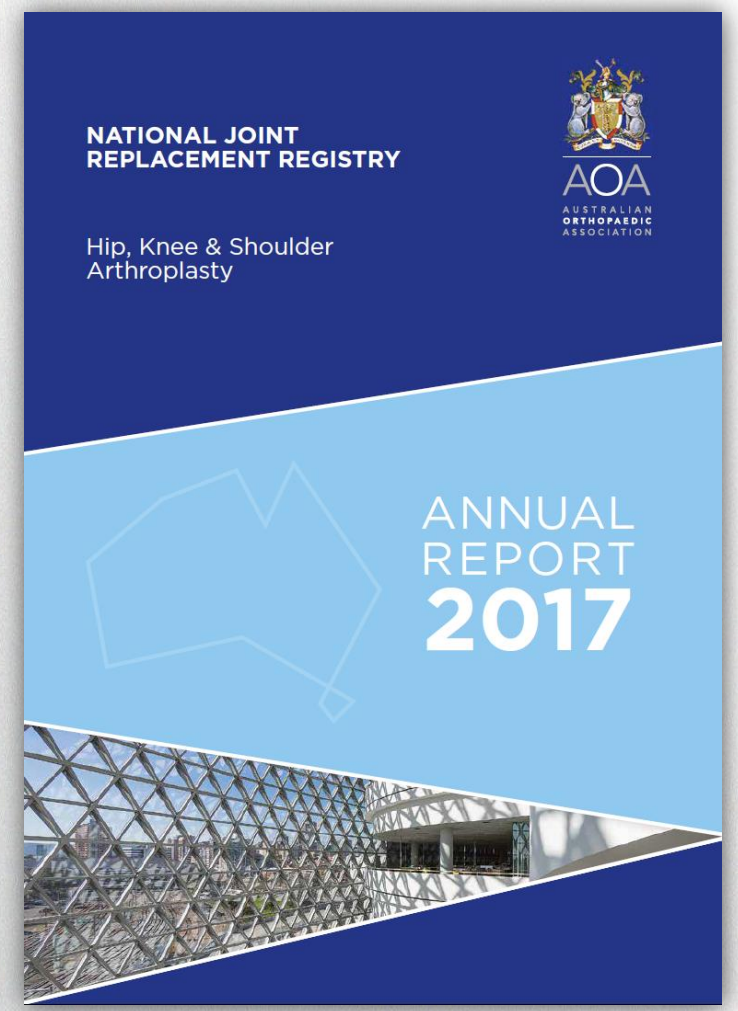


AUSTRALIAN REGISTRY



POST-OP

CUMULATIVE % REVISION



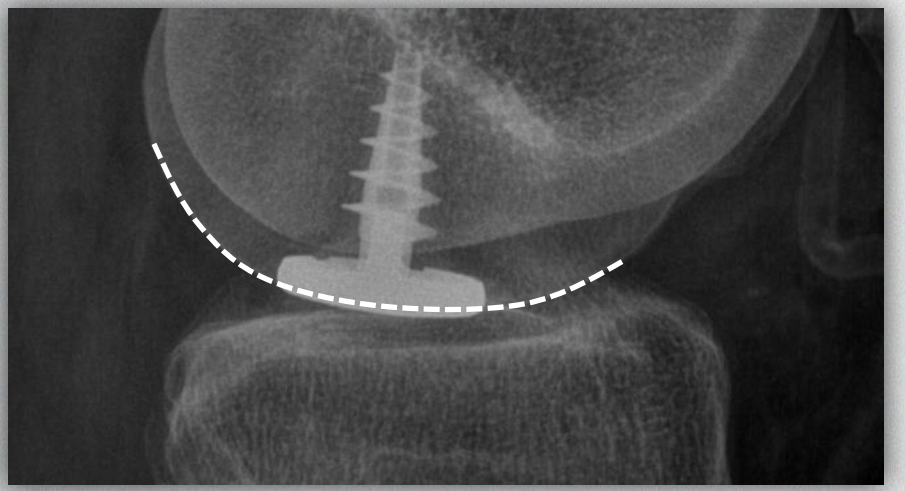
OUR **MATERIAL**

- our material comprises of 4 patients operated in 2015
- indication: focal cartillage 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

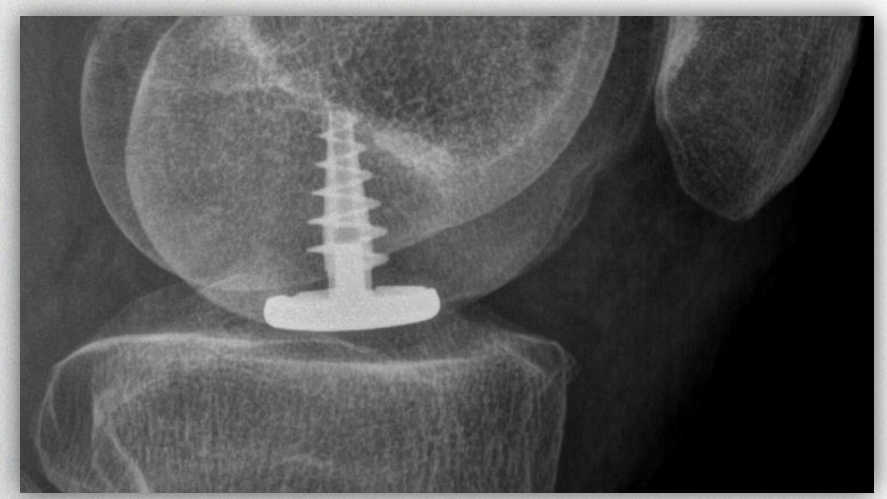
OUR **MATERIAL** | 2 year follow up

Implant	PAIN VAS	Revision	Loosening	Infection	Kissing lesion	Would recommend
	DECREASE	NO	NO	NO	NO	YES
	DECREASE	NO	NO	NO	NO	YES
	CONSTANT	YES (Oxford)	NO	NO	YES	NO
UNICAP	DECREASE	NO	NO	NO	NO	YES

REVISION CASE

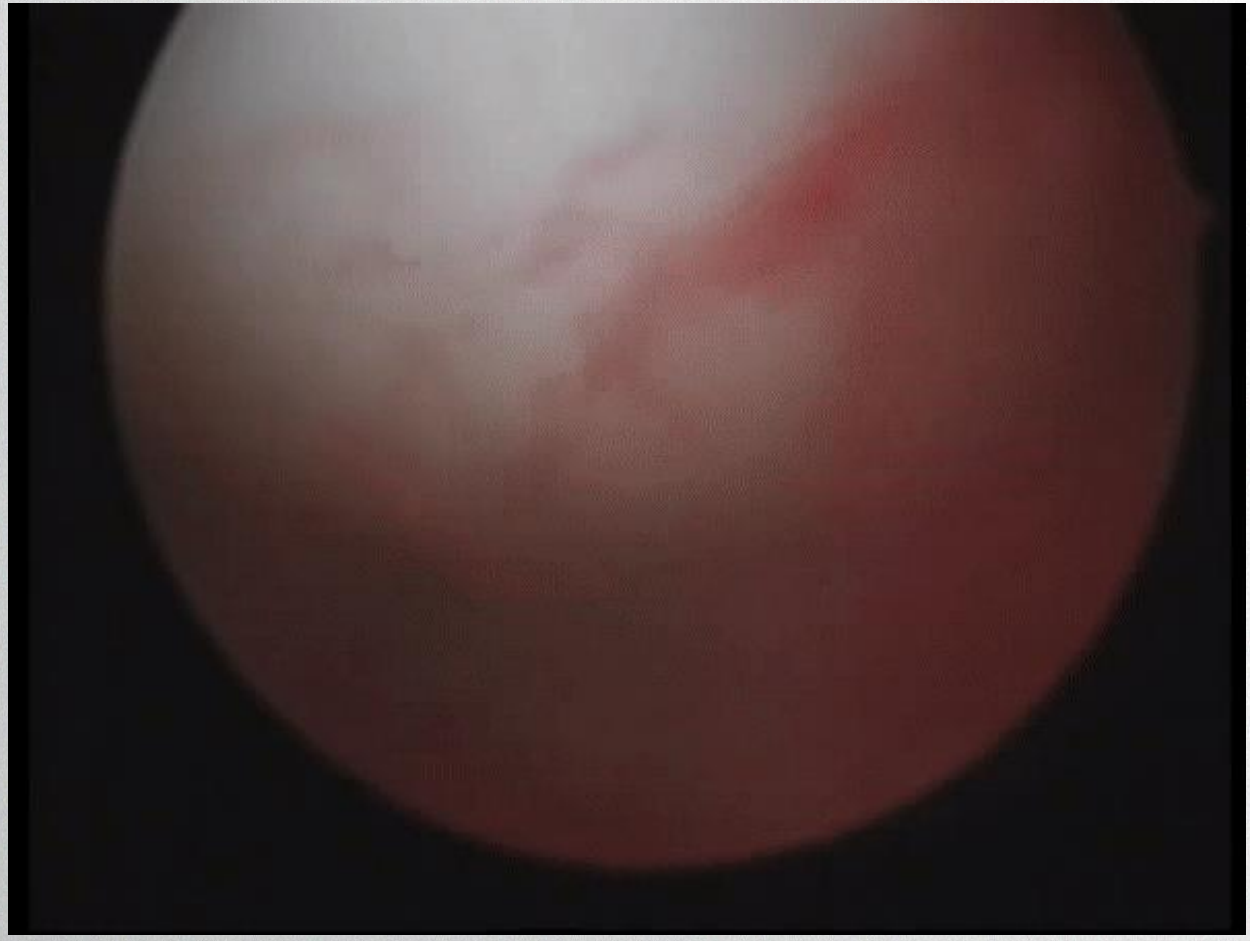


POST-OP

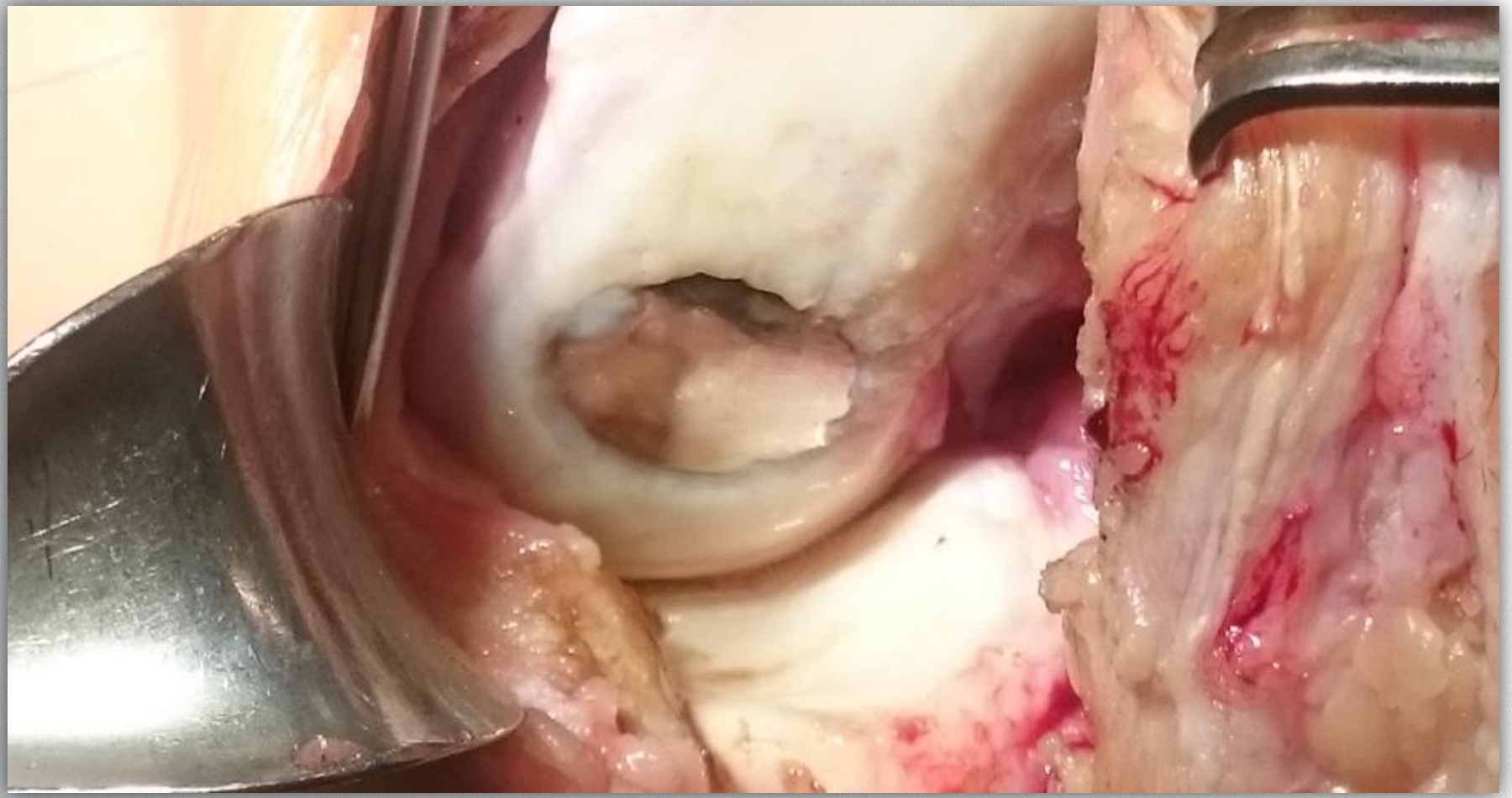


1 YEAR

REVISION CASE



FORTUNATELY REVISION IS **EASY**



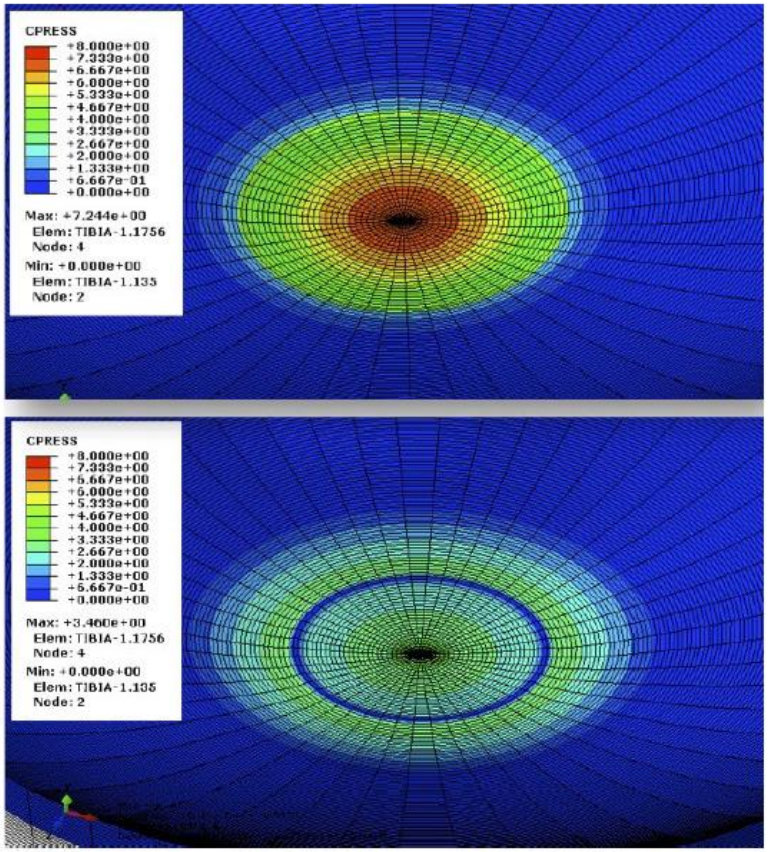
FORTUNATELY REVISION IS **EASY**

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 - 314mm^2 and BioPoly implant on tibial cartilage contact pressures, peak 3.46MPa, active contact zone loaded area - 471mm^2.

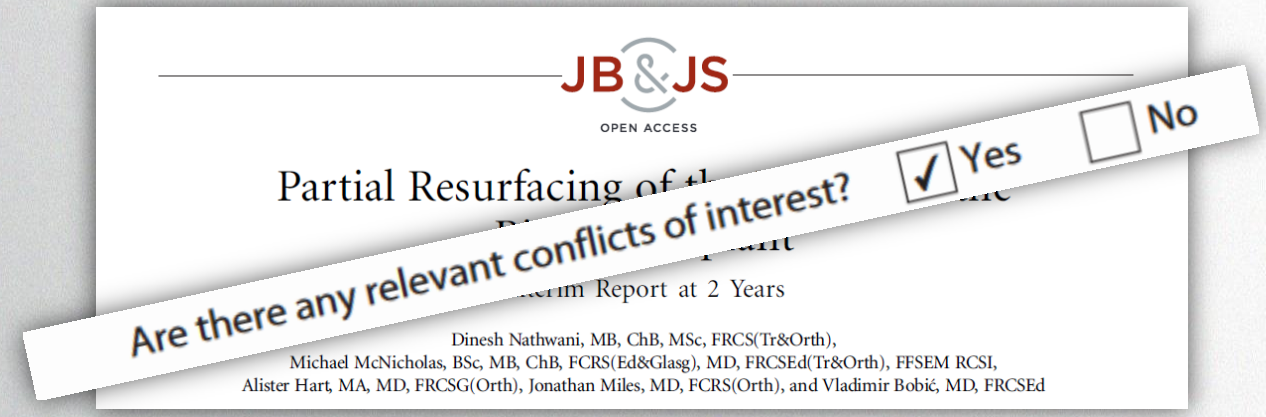
2015 ICRS Convention Abstract

19.3.3 - Focal Knee Resurfacings – Filling the void between biological resurfacing and arthroplasty. (ID 7168)

Presented May 10, 2015

Paul Jermin (Liverpool, United Kingdom) Jonathan Yates (Liverpool,, United Kingdom) **Michael J. McNicholas (Liverpool, United Kingdom)**

NEW IMPLANTS



- 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