Dual Mobility Cups

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“All good things in life come from France”
Gilles Bousquet 1979 + Rambert (SERF)
Inventions Bousquet - Rambert

ICONOGRAPHIE DES INVENTIONS DE G. BOUSQUET ET A. RAMBERT
26 ANS DE TRAVAIL ET D'AMITIE

[Various diagrams and illustrations related to medical devices and tools, each with a year label from 1972 to 1978]
Inventions Bousquet - Rambert
“those who denigrate us don’t understand a thing and we are right”.

1979-1995
The risk of revision due to dislocation after total hip arthroplasty depends on surgical approach, femoral head size, sex, and primary diagnosis.

An analysis of 78,098 operations in the Swedish Hip Arthroplasty Register.

Hailer, Acta Orthop 2012
No. of revisions due to dislocation over time
An increased risk of revision due to dislocation was found for the diagnoses femoral neck fracture (RR = 3.9, CI: 3.1-5.0) and osteonecrosis of the femoral head (RR = 3.7, CI: 2.5-5.5)
Indications for dual mobility

- Primary THA
  - Low demand
  - Non compliant
- Femoral Neck fractures
- (Isolated) acetabular Revisions
- Revision for instability
Non compliant patient
Low Rate of Dislocation of Dual-mobility Cups in Primary Total Hip Arthroplasty.

22 dislocations ( = 0.88 %)
15 larger articulation
7 dislodgement smaller articulation

Combes, CORR 2013
Conversion ORIF to THA
Conversion ORIF to THA
62Y, neglected dislocation
Fracture dislocation
Fracture dislocation
Dual mobility cups hip arthroplasty as a treatment for displaced fracture of the femoral neck in the elderly

Three patients (1.4%), operated through a posterior approach, presented one postoperative dislocation, all of which were posterior.

Adam, Orthop Trauma Surg Res 2012
Relevance of a press-fit dual mobility cup to deal with recurrent dislocation of conventional total hip arthroplasty: a 29-case series.

N = 29

9 previous procedures for dislocation
1 redislocation (3.4%)

Saragaglia
Europ journal orthop surg 2013
A dual-mobility cup reduces risk of dislocation in isolated acetabular revisions.  

Civinini, CORR 2012
Isolated Cup Revision
Isolated Cup Revision
Revision total hip arthroplasty using a reconstruction cage device and a cemented dual mobility cup.

N = 96

cemented fixation of dual mobility cups in cages appears to be a reliable short-term option

Schneider, Orthop Traumato Surg Res, 2011
Isolated Acetabular Cup Revision
Cementation of a dual-mobility acetabular component into a well-fixed metal shell during revision total hip arthroplasty: A biomechanical validation

Wegrzin, J Orthop Research 2013
Cementing dual mobility liners

In conclusion, a dual-mobility acetabular component cemented into a well-fixed metal shell could constitute a biomechanically acceptable alternative to acetabular shell removal or PE liner cementation.
Isolated Acetabular Cup Revision
Surgery

Bone reaming
Removal of (non-functional) bone, precisely as planned

With 3D visualisations in mind

Using bone model of the pelvis
Surgery

Bone reaming
Check with prepared bone model and trial implant
Superficial local reaming, shallow depth, small bone surface area.
Implant insertion

Insert implant. Fit along full perimeter & depth. Hammering. Check surface contact on all flanges and in depth of acetabulum. OK. **Good intimate bony contact established. Unique and very stable position obtained!**
Surgery

Personalised fixation
Screw planning is based on the patient’s bone quality.
Surgery

Screw fixation

Cup screws: 6.5mm spongiosa screws
Flange screws: 4.5mm bicortical screws
Drill guide accuracy

Visualization: Postoperative CT scan, with contours of planned screws in overlay (Ilium)

even cup screws (e.g. pubic ramus) can be placed without any hesitation, correctly
Dual-mobility cups for revision due to instability are associated with a low rate of re-revisions due to dislocation.

58 prior revisions
4 re-revisions for dislocation (2 %)

N = 228

Hailer Acta Orthop 2012
Limitations

• Wear and osteolysis
• Head-liner dislocation
• Surgical Technique
• Cup stability
15 year Survival
Limitations

- Wear and osteolysis
- **Head-liner dislocation**
- Surgical Technique
- Cup stability
Femoral head dislodgement complicating use of a dual mobility prosthesis for recurrent instability

Dislodgement during closed reduction

Banzhof
Journal of arthroplasty 2013
VDA, Female 47 Y

• Dysplasia
• Primary THA age 20
• Postop brace 12 months
• Increasing stiffness and pain
6W after index operation
Intraop findings
Measuring
Trial after stem change
Final construct
Limitations

- Wear and osteolysis
- Head-liner dislocation
- Surgical Technique
- Cup stability
Surgical Technique

- Primary Press fit
- Cup orientation
- Mounting femoral head in liner
Fixation failures of dual mobility cups: a mid-term study of 2601 hip replacements.

The 8-year survival rate of press-fit, grit-blasted cups was lower than that for press-fit, grit-blasted cups fixed with screws (91% versus 100%) and for tripod fixation (98%).

Massini, CORR 2012
Dual mobility and RSA
Dual mobility hip arthroplasty wear measurement: Experimental accuracy assessment using radiostereometric analysis (RSA).

Pineau, orthop trauma surg res 2010
Conclusions

• Here to stay
• Learning curve
• Outperforms constrained liners
• Excellent to prevent and treat dislocation
  – Primary THA
  – Revision THA
• Long term Wear ????
For a perfect day