Klinische und radiologische Ergebnisse
einer «isoelastischen» Pfanne

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Resorption of acetabular bone can be observed and is attributed to stress shielding.
significance of weak acetabular bone stock

- may predispose to migration
- early mechanical failure
- may facilitate migration of wear particles
- problems in revision surgery


- no evidence based clinical relevance

a possible solution → RM pressfit

- Elastic cup design (no stress shielding)
- Ti-particle coating for stable osseointegration
- Maximum PE-thickness results in low wear
Material and Methods

> First implantation: 15.09.2009
> prospective multicenter study (CH, NZL, A, NL, D, UK)

> 1105 cases included
  — 162 patients in Luzern

> Prospective data collection (preop., 6 wks, 6 mth, and 1, 2 and 5 yrs
  — HHS, patient satisfaction
  — complications
  — radiographic analysis
    – inclination, anteversion
    – lucent lines, osteolysis, ectopic bone formation
Demographics (Luzern)

- $n = 162$
- $m : f = 82 : 80$
- $R : L = 77 : 85$
- mean age 67.2 (range 38 to 88)
- mean BMI 27 (range 17 – 47)

- diagnosis:
  - 142 OA
  - 5 AVN
  - 2 fracture
  - 3 DDH
Results (Luzern)

162 patients included

135 patients at 2 years (completed)

73 of 129 patients at 5 yrs

( follow up on-going)
162 patients included

135 pts at 2 years (completed)

73 of 129 at 5 yrs

<table>
<thead>
<tr>
<th>HHS</th>
<th>VAS satisfaction</th>
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<tr>
<td>61 ± 13</td>
<td>3,8 ± 2,2</td>
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<tr>
<td>97 ± 5</td>
<td>9,5 ± 1,2</td>
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<tr>
<td>94 ± 6</td>
<td>9,4 ± 1,3</td>
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Complications (n=162)

> intraoperative
   — 1x fissure of femur
   — 2x fissure of greater trochanter
   — 1x cup tilted during reduction of hip
     - revised next day and secured with screws

> postoperative – follow-up
   — 4x hematoma
   — 1x deep infection
     → resolved with debridement and AB
   — 1x periprosthetic fracture of femur after fall
     → conservative treatment
   — 1x transient femoral nerve palsy
Radiographic parameters

> cup inclination (n = 162)

> cup anteversion (n = 162)
Radiographic follow-up

<table>
<thead>
<tr>
<th></th>
<th>2 yrs</th>
<th>5 yrs</th>
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<tbody>
<tr>
<td>lucent lines</td>
<td>0</td>
<td>0</td>
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<tr>
<td>osteolysis</td>
<td>0</td>
<td>0</td>
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> linear subchondral sclerosis in 3 hips
Radiographic follow-up ectopic ossifications

<table>
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<tr>
<th>Brooker</th>
<th>2 years</th>
<th>5 years</th>
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<tbody>
<tr>
<td>I</td>
<td>15</td>
<td>28</td>
</tr>
<tr>
<td>II - III</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td>1</td>
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Complications: cup revision # 1

- 1x cup tilted during reduction of hip
  - observed on postop radiograph

Images:
- 6 weeks
- 2 yrs
- 5 yrs
Complications: cup revision # 2

> Psoas impingement
  — 1. open revision after one year
  — 2. re-revised after 21 month: cup revision
aim of implant: reduce stress shielding behind implant
on average only minimal bone loss (n.s.) — compared to contralateral hip

bone loss with stiffest cup (CoCr) had greatest change
— 37% medially
— 28.6% at level 1
— 16.4% level 2
Is there a progression of BMD decrease?

- most studies cover a time period of 1 to 3 years — decrease BMD 8–33%
- prospective 10 year follow-up, uncemented metal back


  - most important loss after 1 year, stabilizes after 3 years, no further decrease
  - controlateral side decrease of BMD
    - cortical 3%, cancellous 6% at ten years
Retrospective study on cup ingrowth (n=50, 1 year f/u)

> Methods
  — visual analysis bone density
    - increase
    - rarification trabeculae
    - sclerosis

> Results
  — increase of bone density (zone DeLee)
    - 26 hips: zone I
    - 18 hips: zone I and II
    - 0 hips: zone III
  — no increase
    - 13 hips
- linear periacetabular sclerosis
- 6 patients
- CT scan show complete osteointegration
- radiologic phenomenon
Observations behaviour of acetabular bone

> isoelastic cup
> expect
  — no or little decrease in bone mineral density
> filling up gaps

preop  6 weeks  2 yrs  5 yrs
resolution of hypersclerosis

postop

12 month

5 years
Vitamys cup for difficult hips

preop  6 weeks  2 years
Summary

- clinical and radiographic results of the RM Vitamys cup at 5 years are excellent

- from a theoretical and clinical point of view the implantation of an isolelastic acetabular cup may overcome problems such as stress shielding and acetabular bone loss.

- supported by the literature *Hooper N et al. CORR 2015*

- radiographic results support the concept of bone preservation
Is periacetabular bone preservation necessary?

60 yrs male patient
THA for > 20 yrs
bicycle fall on right side

1 year