Factors influencing the stem migration rate after implantation of a short-stem hip implant

M. Schär, M. Fleck, R. Camenzind, A. Antoniadis, M. Röthlisberger, N. Helmy
Conflicts of interest

N. Helmy

- Consultant for:
  - Mathys Ltd, Switzerland
  - Medacta International, Switzerland
  - Bayer

- Royalties
  - Medacta International, Switzerland

Other authors

- none
Introduction

- **Cementless short stems** have gained popularity in total hip arthroplasty (THA)
  - more physiological load transfer
  - Possibility for less invasive surgery
Introduction

- **Aseptic loosening**
  - Most common reason for implant failure

- **Conventional THA**
  - Early migration good predictor for mechanical failure
  - **Subsidence > 1.5 mm** after 2 years predictive for late aseptic loosening

Streit et al: CORR 2016
Krismer et al: JBJSB 1999
Introduction

Aim
2 year subsidence of a cementless anatomic short-stem

Hypothesis
Short-stem shows acceptable subsidence rate that is comparable with long-stem
Methods

- Prospective single center series
- 69 consecutive patients
  - mean age: 64.5 y; range: 42.5 – 87.8 years
  - female: 25  male: 44
- Surgery between Mar 2011 and Aug 2012
Methods

### Inclusion

- Age: 18 - 85 years
  - Primary OA: 92.8%
  - Secondary OA: 4.3%
  - Congenital dysplasia: 1.4%
  - Rheumatoid arthritis: 1.4%

### Exclusion

- Revision Surgery
- Sepsis
- Cancer
- ASA >3
- Periprosthetic fracture (n=3)

### Total hip arthroplasty (n = 69)

- 2 experienced senior surgeons
- Uncemented short hip-stem (Optymis, Mathys Ltd, Switzerland)
- Anterior approach
Methods

**EBRA**
One picture x-ray analysis

- Postoperative
- 6 weeks
- 12 weeks
- 1 year
- 2 years
Methods

Total hip arthroplasty \( (n = 69) \)
- 2 experienced senior surgeons
- uncemented short hip stem (Optymis, Mathys Ltd, Switzerland)
- anterior approach

Postoperative Regimen
Full weight bearing according to patients tolerance
Primary outcome measure

Subsidence of the stem 2 years p.o. [mm]

Secondary outcome measures

Correlation between subsidence and clinical / radiographical factors
No intra- or postoperative complications except...

...3 intraoperative femoral fissures
(excluded from the study)

No revision surgery up to 24 months
No infections
Results

Subsidence after 2 yrs

2.38 +/- 1.88 mm

56% with subsidence less than 2.25 mm

n=69, mean +/- SD
Results

Subsidence over time

Subsidence (mm)

Months

n=69, mean +/- SD
Results

Learning curve

Subsidence (mm)

Mar - Mai 2011 (n=18)  |  Jun - Sep 2011 (n=19)  |  Okt - Dec 2011 (n=17)  |  Jan - Aug 2012 (n=18)

n=69, mean +/- SEM
Results

Subsidence **negatively correlated** with

stem size \( r = -0.26 \quad p = 0.02 \)

Subsidence **did NOT correlate** with

Satisfaction at last FU
Pain at last FU
Leg Length difference at last FU
Weight at last FU
Age at surgery
BMI
Harris Hip Score

Pearson Correlation, \( r = \) correlation coefficient, \( n=69 \)
Conclusion

- The short-stem hip implant shows migration up to 2y
- Undersized stem is a significant risk factor for stem migration
- Significant learning curve for new implant
- Subsidence may be higher than seen in conventional stems
Thank you

michael.schaer@spital.so.ch