# Does revision to ceramic on polyethylene bearings following ceramic fracture cause catastrophic wear?

*Jonathan Barrow*

*Adeel Aqil*

*Graham Hastie*

*Henry Wynn-Jones*

# Background

- Bearing fracture is a rare complication
  - Modern ceramic bearing materials
- Revision to a hard on soft bearing (delta ceramic head and cross-linked polyethylene) is controversial
  - concerns about catastrophic wear
  - fractured ceramic particles.

# Methods

- Retrospective data collection
  - Electronic patient records
  - Revision database
  - Picture archiving and communication system (PACS)
- Templating software was used to determine wear
- Univariate analysis
  - patient demographics
  - wear rates
- Intra and inter- rater reliability of wear measurements was calculated.

# Results

- Twelve patients met the inclusion criteria
  - 9 males and 3 females
  - Average age at revision was 62 years (54 - 72)
  - 6 liner and 6 ceramic head fractures
  - Average time to revision surgery 8.2 years (1.2 - 14.9)
- All hips were revised to using delta ceramic heads and cross-linked polyethylene acetabula components.
  - The most common head size used was 32mm

- At a mean follow up of 10 months (5-16.6 months) wear was calculated at 0.17mm (0-0.3)
- At mean follow up of 19 months (14-24 months), the wear was calculated at 0.30mm (0.1-0.8)

- Intra-rater repeatability was strong
  - Correlation coefficient of 0.93
- Inter-rater repeatability was good
  - Correlation coefficient of 0.79.

- There were no instances of catastrophic failure
  - 1 hip was subsequently revised for infection

# Conclusion

- Revision to ceramic on polyethylene (CoP) bearings following ceramic fracture does not cause early catastrophic wear

- CoP bearing is safe in early follow up
  - Wear rates comparable to primary CoP bearings

- Long term follow-up is required to assess if there is later catastrophic wear.

# Does revision to ceramic on polyethylene bearings following ceramic fracture cause catastrophic wear?

NHS
Wrightington, Wigan and Leigh
NHS Foundation Trust

Ceramic fracture is a rare event in THR

0.19 - 0.3%

High Morbidity

## Gold Standard

Revise to ceramic on ceramic bearing

### Risks

- Noise generation
- Further Fracture
- Limits acetabular reconstructive options
- Expensive

### Benefits

- Less expensive
- Good Survivorship
- Good wear

### Concerns

- Catastrophic Failure
- 3rd Body Wear

## Alternative

Ceramic on polyethylene

**Theory**
Ceramic particles embed in the poly so 3rd body wear ceases

**Wear**
10 months - 0.17mm
19 months - 0.30mm

## Study

- Retrospective
- Radiological review of acetabular linear wear
- All THR CoC# revised to CoP

## Results

- 12 THR (9 men / 3 Women)
- Average age at revision - 62 years
- Revised to delta ceramic and XL poly
- 6 linear and 6 head fractures

## Outcome

Revision to CoP post ceramic fracture is safe in the short term

**Needs**
Longer term follow up


wrightington
Lower Limb Unit

*Authors: Jonathan Barrow, Adeel Aqil, Henry Wynn Jones*
*Institution: Centre for Hip Surgery, Wrightington Hospital, UK*



*Meeting: British Hip Society, Wales, 2020*


SCAN ME

Link to abstract

The John Charnley Trust