CEMENT IN CEMENT FEMORAL COMPONENT REVISION: MID-TERM RESULTS USING TWO COLLARLESS, TAPERED STEMS

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Introduction

- Cement-in-cement revision of the femoral component is a widely practiced technique for a variety of indications
- Indications include correction of femoral component malposition for recurrent dislocation, leg length discrepancy, mismatch of femoral and acetabular components during revision surgery and two-stage revision for infection [1]
- Removal of the entire femoral cement mantle during revision hip arthroplasty increases the risk of complications [2]
- Clinical studies have indicated promising early and mid-term femoral component survivorship utilising this technique [3]
- No studies have directly compared the medium-term outcomes of different femoral taper fit stems used for cement-in-cement revision

Aims

We aim to report the clinical and radiological outcomes for cement-in-cement femoral revisions performed using 2 types of polished tapered stems (Exeter and C-Stem AMT)

Methods

- A prospectively collated database was analysed to identify patients undergoing revision of the femoral stem using a cement-in-cement technique from Jan 2005 to Jan 2013
- Following this search, suitable patients were then excluded by a predetermined exclusion criteria as shown below in Figure1.
- Outcomes measured included clinical outcome scores (Oxford Hip score, WOMAC and SF-12), radiographic analysis (leg length discrepancy, Barrack cement grading) and survivorship

Figure 1: Inclusion and exclusion criteria

Inclusion	Exclusion
• Single surgeon - senior author was either principal surgeon or supervising • Exeter or C-Stem AMT prosthesis	• Less than 2 years follow up

Results

Figure 2: Aetiology of cases undergoing cement-in-cement revision in both groups

Reason for cement-in-cement revision	Cumulative n (%)	Exeter n (%)	C-stem AMT n (%)
Aseptic loosening of cup	63 (65%)	35 (70%)	28 (60%)
Dislocation	18 (19%)	12 (24%)	6 (13%)
Conversion of hemiarthroplasty	8 (8%)	2 (4%)	6 (13%)
Fracture	3 (3%)	1 (2%)	2 (4%)
Component impingement	3 (3%)	0 (0%)	3 (6%)
Metal-on-metal components	2 (2%)	0 (0%)	2 (4%)

Figure 3: Patient demographics for both groups.

	Exeter	C-stem AMT	*p* value
% patients (n)	52% (50)	48% (47)	
Mean age (range)	70 (49 – 92)	67 (21 – 88)	*p*=0.181
% female (n)	39, 78%	31, 66%	*p*=0.194
Mean BMI (range)	27 (22 – 38)	29 (20 – 42)	*p*=0.422
Median ASA score	2	2	*p*=0.914

Figure 4: Radiographic analysis of both femoral components. The only significant difference was leg lengths were shorter in the Exeter group.

	Exeter	C-stem AMT	*p* value
Varus **Neutral** **Valgus**	19% 81% 0%	14% 86% 0%	*p* = 0.214 *p* = 0.336
Mean subsidence	0.5 mm (0 – 1.6 mm)	0.3 mm (0 – 1.2 mm)	*p* = 0.089
Barrack A/B	92%	98%	*p* = 0.248
Mean LLD	-4mm (range -25mm to + 13mm)	0mm (range -24mm to + 20mm)	*p*=0.032

- Clinical outcomes scores - Both groups showed improvements in OHS, WOMAC and SF-12 scores compared to pre-operative levels (p<0.001)
- No difference between groups for OHS (p=0.059), WOMAC (p=0.426) or SF-12 (p=0.938)
- Survivorship - 16/97 patients (16.5%) underwent further revision of the femoral component (7 in the C-stem AMT group and 9 in the Exeter group). No femoral components were revised for aseptic loosening

Discussion

- This is the first reported series directly comparing outcomes for cement-in-cement revision using two different collarless tapered stems
- While there is substantial evidence supporting the use of the Exeter stem as a cement-in-cement revision component, our study adds verification of this independent of results from the design centre[4]
- There is little published evidence for the C-stem AMT utilised as a cement-in-cement prosthesis. Given this limitation in evidence a comparison between the two stems was important, particularly as there are design differences between the two implants[3]
- There are limitations with this paper. Firstly, our sample size was not large. This is offset by the advantages of the study being a single surgeon series with a long follow-up period.
- Although all data was collected prospectively, there was no randomisation of patients. The stems being utilised were used as per local procurement reasons. Despite this, the two cohorts were comparable in terms of age, sex and BMI.
- The follow up period for the Exeter stem was longer reflecting the adoption of the Exeter stem for cement-in-cement revision procedures prior to the Cstem AMT. The C-stem AMT group may therefore have benefitted from greater surgeon experience with the surgical technique of cement-in-cement revision compared to the Exeter stem group.

Conclusion

- Our series shows promising long-term outcomes for the cement-in-cement revision technique using either the Exeter or C-stem AMT components.
- We found no cases of revision for aseptic loosening and significant improvements in outcome scores.
- Cement-in-cement revision using either a double or triple taper-slip design is a safe and reliable technique when used for the correct indications.

References

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