

## **Reduced Long-term Periprosthetic Fracture Rates with Composite Beam Stems vs. Polished Tapered Stems in cemented Hip Arthroplasty: A 10-year observational study**

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**Background:** Cemented polished-tapered-stems (PTS) used in hip arthroplasty have been shown to be problematic in frail populations due to the high rate of periprosthetic fractures (PPF).

**Aims:** This study evaluates the effect of a transition from PTS composite-beam-stem (CB) on periprosthetic fracture rates up to 10 years after primary surgery.

**Methods:** A 10-year, prospective observational study was conducted on patients undergoing cemented hip arthroplasty. There were 542 patients in the PTS group and 534 in the CB stem group. The average age was 82 years. Most patients were classified ASA 3–4 and were female. 77% underwent hip arthroplasty due to fractures. Cognitive dysfunction was present in 28%. Data on reoperations, periprosthetic fractures, prosthetic joint infections, and dislocations were collected. Cox regression analysis was performed to adjust for confounders.

**Results:** The groups were well matched. The revision rate for PTS was 9.7% and 5.2% for CB. Dislocation, periprosthetic joint infections and periprosthetic fractures were more common for PTS. In the regression model female sex (HR 2.0, 95% CI 1.2-3.1), ASA class (HR 3.2, 95% CI 1.1-8.3), cognitive dysfunction (HR 1.9, 95% CI 1.2-3.2) and the type of stem (PTS vs CB, HR 0.2, CI 0.1-0.3) were correlated with outcome.

**Conclusion:** CB significantly reduces the risk of adverse events compared to PTS in cemented hip arthroplasty in an older population. This supports the use of CB stems in order to improve patient outcomes and minimize complications.