Monoblock or Modular Stem in Hip Revision Surgery? A Registry Study of 3,647 Patients

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INTRODUCTION:
Total hip arthroplasty (THA) revision is a complex procedure, often requiring femoral stem replacement due to loosening, instability, or femoral fractures. Tapered conical stems are the current standard to enhance stability and manage bone loss. Recent design modifications have increased the taper angle to improve distal fixation and reduce the risk of subsidence. These stems are available in both modular and monoblock versions, each with specific advantages and disadvantages. However, it remains debated which configuration offers superior long-term outcomes. This study evaluates the 20-year survival and performance of monoblock versus modular tapered stems, with a focus on taper angles.
METHODS: A retrospective analysis was conducted on a large cohort of THA revision procedures from 2000 to 2021 using data from the Emilia-Romagna Registry of Orthopedic Prosthetic Implants (RIPO). Survival rates were calculated for modular and monoblock tapered stems, considering the influence of the taper angle.
RESULTS: A total of 3,647 conical stem revisions were recorded in the RIPO registry (32.4% monoblock, 67.6% modular). Failure rates were 5.1% for monoblock stems (mainly due to aseptic loosening) and 6.9% for modular stems (mainly due to instability) (p=0.005). Long-term survival analysis showed significantly better outcomes for monoblock stems, with 93.7% survival at 20 years compared to 86.8% for modular stems. Taper angle also impacted outcomes: stems with a 2° taper showed better survival than those with a 3° taper, regardless of design.
DISCUSSION AND CONCLUSION: Monoblock conical stems, particularly those with a 2° taper, are associated with improved implant survival. While modular stems offer advantages in adjusting anteversion and facilitating partial revisions, they carry a higher risk of reoperation. The choice between monoblock and modular stems should be carefully considered based on individual patient characteristics and surgeon experience.