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Is It Possible To Reproduce Offset And The Center Of Rotation With A Short Stem? Data Of 162 Consecutive Cases

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Introduction: Patients with osteoarthritis of the hip are getting younger and therefore have higher expectations of their hip function compared to older individuals. Hip functions improve with anatomic reconstruction of offset, center of rotation and leg length. The industry is pushing bone sparing, short stems for total hip arthroplasty, which should fulfill these requirements. However data is missing to confirm or contradict its potential in bone preservation and the restoration of the patients anatomy.

Objectives: Analysis of a anatomic short stem for total hip arthroplasty to restore offset and leg length

Methods: Retrospective radiological study with 162 patients operated in five different hospitals with implantation of the optimys short stem (Mathys medical, Bettlach, Switzerland) and its corresponding cup (RM, Vitamys or other). Seven parameter were assessed: Acetabular offset (AC= horizontal distance between teardrop and center of rotation), femoral offset (FO= distance of center of rotation and longitudinal axis of the femur) and a combined offset of AC and FO. The center of rotation (COR), representing the vertical distance between teardrop and COR and leg length was measured. Additionally the alpha angle, representing the implant position in regard to the anatomic axis was measured. All measurements were performed on standard pelvic x rays; each measurement was performed three times. The arithmetic mean was taken for statistical analyzes.

Results: The difference of acetabular offset was 4.1mm (SD 5.1, range -7.0 - +4.0) compared to the healthy side. Femoral offset was -5.5mm (SD 7.0, range -23 - +12.0). Combined offset -1.4mm (SD 7.6, range -22 - + 21.0). The center of rotation was medialized 4.1mm (SD 5.1, range -20 - +11.0). The mean leg length difference was 1,9mm (SD 6.8, range -19 - +17.0). The mean alpha angle was -0.9° (SD 4.3, range -16.7 - +7.7).

Conclusions: The here investigated anatomic short stem, seems to have the potential to restore patients anatomy in regard to offset, center of rotation and leg length. Therefore short stems might be an interesting alternative to standard implants, especially in younger patients. However clinical and longterm survivorship data are missing and need further investigation.