

Does Lumbar Arthrodesis Compromise Outcome Following Hip Arthroplasty? - A Case Control Study

Orthopaedics / Pelvis, Hip & Femur / Joint Replacement - Primary

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Background

Degenerative pathology of the hip and spine often co-exist in the ageing population, a clinical scenario termed Hip-Spine-Syndrome (HSS). Management is typically directed at the primary pain generator; however, treatment of one condition may make the untreated condition more symptomatic, with the need for surgery in both the hip (i.e. total hip arthroplasty (THA)) and the spine (decompression and arthrodesis).

An important determinant of outcome following THA is acetabular component (cup) orientation. Cup orientation is significantly influenced by pelvic tilt, a measure of sagittal pelvic orientation. A change in pelvic tilt is a compensatory mechanism adopted to maintain an upright posture in patients with 1. Fixed flexion deformity of the hip or 2. Spinal sagittal misalignment 20 to spinal pathology. After decompression and fusion, the typical loss of lumbar lordosis is partially restored which would change pelvic tilt and cup orientation in patients with THA, which may lead to complications.

Objectives

The aims of this case-control study were to determine:

1. Whether the presence of a spinal arthrodesis is associated with increased complications and compromised outcome in patients with a THA.
2. Whether the outcome of THA is inferior if performed prior to SA, compared to the THA being performed 2nd.

Study Design & Methods

This is a retrospective case-control study from a single-centre. All patients that underwent decompression and SA between 2004 – 2015 were identified (n=748). 42 of those also had at least one THA at the time of review and formed the cases. There were 54 THAs in 42 patients; 30 (56%) had THA prior to SA (THA-1st Group) and 24 (44%) had THA after the SA (THA-2nd Group). The mean age at SA was 68 (SD:10) and most cases had either 1- (n=30) or 2- level (n=20) SA. The most common level of SA was L4/5 followed by L4-S1. The mean interval between THA and SA was 3.8 years (SD:3).

Outcomes included complications, revision, radiographic cup inclination and functional outcome (Harris hip score (HHS)). Outcome was compared between THA-1st Group and THA-2nd Group and between cases and controls. Controls were a group of patients (n=78) that received a THA by the same surgeons and had no previous SA. Controls were matched for age (p=0.2), and gender (p=0.1).

Results

At a mean follow-up of 6 years (SD:4), 5 of the cases had sustained a complication. No neurological complications were observed. The HHS improved from 53 (28 - 81) to 81 (45 - 100). The mean inclination was 41 (SD: 9) and mean anteversion was 22 (SD:9); 31 hips were within optimum cup zone. On average neither inclination (0° , SD:2) nor anteversion (1° , SD:4) altered with SA in the THA-1st group. More than 1 level SA was associated with greater increase in anteversion (3°) compared to 1-level SA (0°) ($p=0.02$).

Overall, there was a greater incidence of complications seen in the cases ($p=0.04$). There was no difference detected in cup orientation between the groups ($p=0.5$) The controls had a significantly better HHS at follow-up ($p=0.03$ but no difference in HHS ($p=0.1$).

There were no difference in complications ($p=0.1$), revision rates ($p=0.5$) nor cup orientation ($p=0.6$) between THA-1st and THA-2nd Groups. Greater improvement of HHS was seen in the THA-1st (HHS=41), compared to the THA-2nd group (HHS=19) ($p=0.01$).

Conclusions

This study demonstrates that patients with HSS, not requiring multi-level SA, can have good outcome following THA. Where both THA and SA are warranted, a better functional outcome may be achieved by performing the THA first.