Radiographic limb length difference: a predictor of stiffness and physical function post total hip arthroplasty?

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INTRODUCTION:
Limb Length Discrepancy (LLD) is a common complication following Total Hip Arthroplasty (THA). This study aims to assess the effect of post THA limb shortening/lengthening on clinical outcomes and determine a possible relationship between LLD and patient-reported-outcome-measures (PROMs).
METHODS:
This was a single-centre, multi-surgeon, prospective follow-up study of 443 elective primary THA patients. Length of stay (LOS), pre-operative/6-month/2-year Oxford Hip Score, Western-Ontario-and-McMaster-Universities-Osteoarthritis-Index (WOMAC), Mental Component Score and Physical Component Score (PCS) of the 36-Item-Short-Form-Health-Survey, patient satisfaction and fulfillment of expectations were collected by an independent healthcare professional. Immediate post-operative supine AP hip radiographs were reviewed, with LLD defined as the difference in distance from the most distal point of the pelvic teardrop to the most inferior end of the lesser trochanter, between the native and operated limb.
RESULTS:
Absolute LLD ≥ 5mm resulted in a longer LOS than absolute LLD < 5mm (5 [4,7] vs 4.5 [3,6] days, p=0.026). In particular, limbs shortened ≥ 5mm had a longer LOS than limbs shortened < 5mm (6 [4,8] vs 4 [3,6] days, p=0.011). Limbs shortened ≥ 5mm were less likely to reach minimally-clinically-important-difference (MCID) for 6-month WOMAC-Stiffness compared to limbs lengthened ≥ 5mm (27.0% vs 53.8%, p=0.032). However, limbs lengthened ≥ 5mm had worse 6-month (46.1 [33.1,51.6] vs 49.8 [41.8,55.2], p=0.021) and 2-year (50.4 [41.4,52.5] vs 53.4 [46.9,55.0], p=0.029) PCS compared to limbs shortened ≥ 5mm. When LLD was within 5mm, there was no difference in outcome between shortening or lengthening. Similarly, limbs lengthened < 5mm or ≥ 5mm performed equally. No linear relationship was found between LLD and any of the PROMS measured.
DISCUSSION AND CONCLUSION:
Immediately after operation, patients with limbs shortened ≥ 5mm may struggle to engage the operated limb fully, delaying physiotherapy clearance and discharge. Subsequently, they may rely on the longer native limb for walking, contributing to poorer 6-month improvement in stiffness. While limbs lengthened ≥ 5mm are likely to be more engaged, the altered gait mechanics result in relatively poorer physical function at 6-months and 2-years.