

Cost-utility analysis of periacetabular osteotomy plus arthroscopy for hip dysplasia compared to periacetabular osteotomy alone

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INTRODUCTION: A periacetabular osteotomy (PAO) is typically performed on patients to delay or prevent the need for joint replacement surgery later on in life and improve a patient's quality-of-life. Hip arthroscopy plus PAO has been recommended in order for surgeons to address the intraarticular pathology inside the hip joint, however, it comes with increased healthcare costs. The objective of this research was to conduct a trial-based economic evaluation to assess the cost-effectiveness of PAO plus arthroscopy compared with PAO alone over a 2-year time horizon from a publicly funded healthcare system perspective.

METHODS: We conducted a cost-utility analysis based on a randomized controlled trial of 117 patients with hip dysplasia. Patients were randomized to receive PAO plus arthroscopy or PAO alone. Effectiveness was measured as quality-adjusted life years (QALYs). Costs included procedure costs, hospitalization, and physician fees associated with the surgery. A mixed model was used to estimate difference in costs and QALY and to calculate the incremental cost-effectiveness ratios (ICERs) with 95% confidence intervals (CI). Bootstrapping method was used to characterize statistical uncertainty around the cost-effectiveness estimates.

RESULTS SECTION: Sixty-two patients had PAO plus arthroscopy and 55 patients had PAO alone. The mean age was 27.9 years (SD=8.14) and the majority of patients were female (84%). The PAO plus arthroscopy led to an additional cost of C\$6,381 (95% CI C\$5,164, \$7,598) and reduced QALYs of -0.016 (95%CI -0.111, 0.079). The probability that PAO plus arthroscopy was cost-effective was 0% at the willingness to pay value of \$50,000 per QALY.

DISCUSSION: Over two years, PAO plus arthroscopy cost more and did not improve health utility compared with PAO alone. The point estimates favored PAO alone for both costs and QALYs, and at a willingness to pay of fifty thousand dollars per QALY the probability of cost effectiveness for the combined procedure was zero. Routine addition of arthroscopy is therefore difficult to justify in a publicly funded system. This interpretation is bounded by the two year horizon, variation in intraarticular work, and the absence of productivity costs. Longer follow up and predefined subgroup analyses may identify patients who benefit enough to alter the value assessment.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): For most patients with dysplasia undergoing PAO, adding arthroscopy does not deliver value at two years. Choosing PAO alone can lower system costs without loss of health utility. These results support reserving arthroscopy for clear clinical indications rather than routine use.