

Effects of Preoperative Intra-articular Corticosteroid Injections on Outcomes After Periacetabular Osteotomy

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INTRODUCTION: The various movements in team and individual sports are highly dependent on the ability of the hip to move and control multiplanar actions. Consequently, hip pain of various etiologies is a common source of decreased sport participation. Injuries and pain of the hip may be exacerbated or precipitated by hip dysplasia - a condition characterized caused by inappropriate coverage of the femoral head by the acetabulum, causing hip instability. Intra-articular corticosteroid injections (IACSI) are a common measure for short-term management of progressive pain caused by hip dysplasia and femoroacetabular impingement, allowing for improved return-to-sport time in some patients. However, while IACSI may stave off hip dysplasia in the short-term, surgical intervention is often required to permanently correct hip dysplasia and prevent joint degradation. Periacetabular osteotomies (PAO) are commonly used as a more permanent treatment for hip dysplasia. However, there is a lack of evidence confirming the safety of administering intra-articular IACSI in lieu of the immediate treatment of hip dysplasia with a PAO. The objective of this study was to assess whether there was an association between receiving a pre-operative IACSI and overall improvement after PAO based on patient reports outcomes (PROs).

METHODS: A single surgeon, prospectively collected hip database was utilized for this study. Patients who received a PAO or a PAO with concomitant hip arthroscopy, as well as those who completed pre-operative and minimum 4-month post-operative questionnaire, were included. Institutional review board approval was obtained from the UTHealth Houston Committee for the Protection of Human Subjects. Informed consent was obtained from all study participants prior to their enrollment. The patient reported outcome measures that patients completed include the international hip outcome tool score (iHOT-12), hip outcome score-activities of daily living (HOS-ADL), hip outcome score- sports-specific subscale (HOS-SSS) and VAS pain scores. All outcome scores were reported on a 100-point scale. Higher iHOT, HOS-ADL and HOS-SSS scores indicate higher functionality. Additional variables extracted from the questionnaire include demographics, and whether a patient received an IACSI prior to surgery. Frequencies and percentages were calculated for categorical variables. The student's t-test was used to compare differences in hip outcome scores between surgical patients who did and did not receive a preoperative IACSI. Multivariate linear regression was used to compare the impact of follow-up time, sex, age, BMI, and IACSI administration on preoperative to postoperative changes in hip outcome scores.

RESULTS SECTION: 80 patients were included in the analysis. Patients were an average of 26.7 years old (SD=8.28), were of varying ethnicities (75.0% Caucasian, 1.25% African American, 3.75% Hispanic/Latino, 5.00% Asian, 6.25% other, 8.75% not identified), had an average BMI of 24.5 (SD=4.88), and were composed of 75 females and 5 males. 49 (61.3%) patients reported not receiving a preoperative IACSI, and 31 (38.8%) reported having an IACSI. 68 (85%) patients underwent a PAO with concomitant hip arthroscopy, while 12 (15%) only underwent a PAO. After their PAO, 14 (17.5%) patients underwent symptomatic hardware removal, and five (6.3%) patients experienced neuropathic pain. While two patients experienced a postoperative fever with negative blood cultures, no patients experienced a confirmed surgical site infection. Median follow-up time was 369.5 days (IQR=187.0, 530.3). All PRO scores showed improvement postoperatively. The mean score improvement was 37.4 (SD=20.2) for iHOT, 25.4 (SD=19.3) for HOS-ADL, 31.2 (SD=34.5) for HOS-SSS and 39.5 (SD=26.6) for hip pain. Mean change in iHOT, HOS-ADL, HOS-SSS and hip pain scores did not differ significantly between IACSI and non-IACSI groups. In a multivariate linear regression analysis controlling for sex, age, BMI, and follow-up time, preoperative IACSI administration was not significantly associated with changes in iHOT ($\beta=1.25$, $p=0.82$), HOS-ADL ($\beta=-0.10$, $p=0.98$), HOS-SSS ($\beta=2.58$, $p=0.75$) or hip pain ($\beta=1.80$, $p=0.79$). In the same analysis, follow-up time in days was significantly positively associated with change in iHOT score ($\beta=0.05$, $p=0.02$) and change in HOS-SSS score ($\beta=0.03$, $p<0.01$).

DISCUSSION: Average preoperative to postoperative hip outcome score changes did not differ significantly based on whether a patient received a preoperative IACSI. Furthermore, in a multivariate analysis controlling for patient characteristics, follow-up time, and preoperative administration of IACSI had minimal effects on changes in hip outcome scores. These results offer support for the hypothesis that IACSI are safe to administer before periacetabular osteotomies and may support delaying PAOs in favor of an initial nonoperative treatment. IACSI may be a valuable treatment option for athletes wishing to delay PAO and return to play, but more work is needed to support this hypothesis. Limitations of this study include the relatively homogenous patient sample and lack of data related to time between IACSI and PAO. Future works could analyze the dosage, number of injections, and relative degree of hip dysplasia prior to surgery to further characterize the relationship between the preoperative IACSI administration and PAO outcomes.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): In this study we found minimal difference in outcomes between patients who did and did not receive an intra-articular corticosteroid injection (IACSI) prior to periacetabular osteotomy (PAO). These findings support the safety of providing an initial IACSI for treatment of the symptoms of hip dysplasia followed by PAO, rather than immediate PAO.