Dega, Pemberton and Salter: A Deeper Comparison of Pelvic Osteotomies for Residual Acetabular Dysplasia

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INTRODUCTION:
Residual acetabular dysplasia in pediatric patients can lead to significant hip dysfunction and premature joint degeneration. Pelvic osteotomies in young children are frequently used to correct this abnormality. However, there is limited comparative data on the outcomes of the most common pelvic osteotomies, namely Dega, Pemberton, and Salter osteotomies. This study aims to analyze and compare radiographic and clinical outcomes of these pelvic osteotomies.
METHODS:
This retrospective review included children between the ages of 18 months to 6 years treated with Dega, Pemberton, and Salter osteotomies for residual acetabular dysplasia between 2010 and January 2024. We excluded patients with syndromic conditions and those that underwent concomitant open reduction of the hip. Data was collected via chart and radiographic review, and complications were assessed using the Clavien-Dindo-Sink system. Descriptive statistics, one-way ANOVA, Tukey HSD post-hoc testing, and t-tests were performed.
RESULTS:
The study included 156 patients with most patients undergoing a Pemberton osteotomy (N=90), followed by Dega osteotomy (N=36) and Salter osteotomy (N=30). Radiographic outcomes demonstrated substantial improvements in acetabular index (AI): 14.7° in Pemberton (from 31.1° to 16.4°), 14.8° in Salter (30.1° to 15.3°), and 17.9° in Dega (33.5° to 15.6°) ($p = 0.06$). Extrusion index (EI) improved postoperatively by 4.3% in Pemberton, 9.2% in Salter, and 6.2% in Dega ($p < 0.05$). At 5 years, EI improvements were 4.5% for Pemberton, 10.6% for Salter, and 9.0% for Dega ($p > 0.05$), with a t-test showing Salter had significantly greater improvement than Pemberton ($p < 0.05$).
While radiographic improvements were notable across all groups, clinical recovery profiles were largely similar. Estimated blood loss averaged 53.5 ml (Pemberton), 67.8 ml (Salter), and 57.6 ml (Dega) ($p = 0.24$). Length of stay was 1.2–1.3 days ($p = 0.79$), and 90-day complications did not significantly differ ($p = 0.47$). However, postoperative immobilization was significantly shorter in the Dega group (4.6 weeks) compared to Pemberton and Salter (6 weeks, $p < 0.001$). Average surgical costs differed slightly, with Dega being the most expensive and Pemberton the least, which may reflect implant cost. Approximately 80% of patients that underwent a Salter osteotomy required a second procedure, mostly for hardware removal.
DISCUSSION AND CONCLUSION: Dega, Pemberton, and Salter pelvic osteotomies are comparable in terms of estimated blood loss, complications, and improvement in acetabular index. Salter osteotomy showed the greatest long-term extrusion index correction but also carried the highest reoperation burden due to hardware removal. A second operation adds additional cost, anesthetic, morbidity and recovery time. Dega osteotomy patients had the shortest immobilization period and may benefit from continued acetabular remodeling, potentially enhancing femoral head coverage over time. These findings can help guide surgical decision-making by balancing long-term correction, recovery course, and the potential for secondary intervention.