

Comparison of Outcomes of Different Graf Grades of Developmental Dysplasia of the Hip in Infants Treated with Tubingen Splint versus Pavlik Harness - A Systematic Review

Ajay Nair¹, Jiayong Liu²

University of Toledo College of Medicine and Life Sciences, OH
ajayarjun2011@gmail.com

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INTRODUCTION: Developmental dysplasia of the hip (DDH) is a pediatric condition where the femoral head is incorrectly sitting in the acetabulum, in infants it is commonly treated by bracing. Two dynamic braces include the Pavlik harness and the Tubingen splint, which until now, the comparison of outcomes treated with the different braces has not truly been investigated, especially based on Graf classification. This systematic review was designed to compare the outcomes of the two braces against each other classified by Graf method.

METHODS: This review searched PubMed, UpToDate, and Google Scholar using keywords “DDH Tubingen versus Pavlik” and Tubingen and Pavlik separately. Included papers were ones which provided specific data regarding success and failure rate, avascular necrosis (AVN), duration, and age of intervention. The excluded studies discussed surgeries, diagnosis and mechanism, and ones that weren’t in English. A Chi-squared test was used for success and failure rate along with AVN rates, while a Student’s t-test was used for duration, age, and time per day. A significance level of $p \leq 0.05$ was used.

RESULTS: 20 papers were included for this review, resulting in 1243 Tubingen and 420 Pavlik samples. It was seen that the Tubingen splint had a statistically significant greater success rate and lower failure rate for Graf 2, D, and 3 hips, while both braces were not very successful for Graf 4 at success rates less than 60%. Tubingen also had a lower incidence of AVN. Both braces shared similar ages of intervention, duration, and time per day.

DISCUSSION: Both braces are very comparable to each other, each having better success rates for lower Graf grades, which points to the importance of bracing earlier to improve the success rates. The Tubingen splint had a higher success rate, lower failure rate, and lower AVN rate compared to the Pavlik harness. This points to the Tubingen splint potentially being the preferred option for bracing in infants. Perspective long-term randomized controlled studies on the two braces is encouraged in the future.

SIGNIFICANCE/CLINICAL RELEVANCE: This study provides very pertinent data regarding treatment of hip dysplasia in infants and how current practices can potentially change from the results obtained in the paper. The aims of the study were achieved in determining which treatment option is better for Graf grades 2-4, which could innovate and alter the treatments in place today.

IMAGES/TABLES:

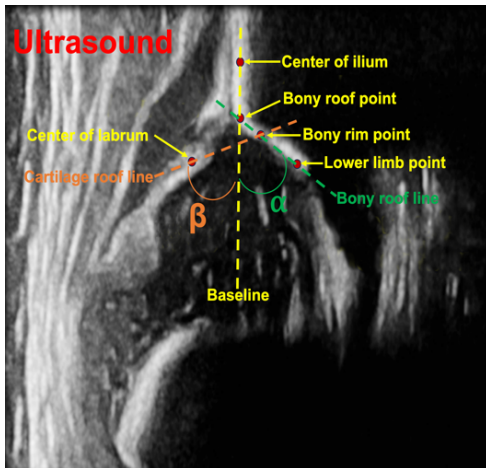


Fig 1: Alpha and Beta Angle Hip



Fig 2: Pavlik Harness

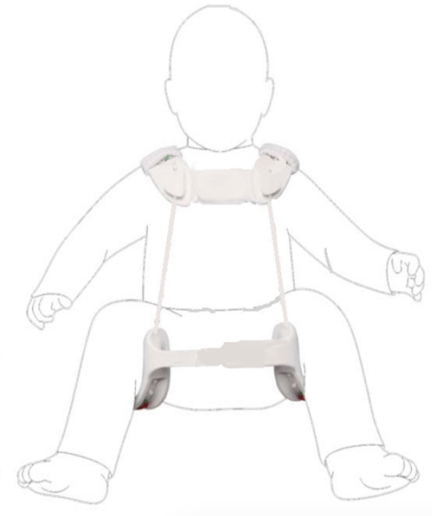


Fig 3: Tubingen Splint