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CORR Insights®: Higher Pavlik Harness Treatment Failure Is Seen in Graf Type IV Ortolani-Positive Hips in Males

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Where Are We Now?

When treating patients with developmental dysplasia of the hip (DDH), the goal is to get the hip concentrically reduced and stable as early as possible with the easiest- and safest-possible means. The Pavlik harness has enjoyed great

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success in the treatment of DDH, often meeting this essential objective. In fact, the success of the harness can be as high as 95% in patients with dysplasia, subluxation, persistent laxity, and Barlow positive dislocatable hips [2]. However, the Pavlik harness is not without its limitations. The harness is purely dependent on the cooperation of parents, as well as on its proper application. Additionally, treating the dislocated hip with the Pavlik harness is quite challenging. Novais and colleagues confirmed that the success of the Pavlik harness is considerably lower in children with dislocated hips [5, 6, 8, 9] compared to those with subluxated and dislocatable hips. Similarly to previously published studies [5, 8, 9], the current study also confirmed that Graf Type IV hips (defined as an alpha angle less than 43° and a downward-displaced labrum) are at higher risk of failing to achieve and maintain concentric hip

reduction compared to subluxated and dislocatable hips.

Where Do We Need to Go?

There are several other risk factors associated with the potential failure of Pavlik harness treatment, such as age at initiation of treatment, male gender, bilaterality, degree of head coverage, initial irreducibility. Unfortunately, current studies have little consensus regarding the utility of these predictive factors. We need to find reliable criteria to estimate the chances of successful harness treatment.

Although the authors agreed with a previously published study [1] which suggested that male gender may also be a risk factor for failure, several other studies have not found a correlation between gender and failure of Pavlik harness treatment. A more comprehensive, adequately powered review is needed to resolve some of these controversies.

For the children failing Pavlik treatment, there is a dearth of well-documented nonoperative alternatives, though rigid abduction bracing has

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been tried with some good results [4]. Other alternatives include traction and closed or open reduction.

In the care of the infant with a dislocated hip, we need to be able to identify who are candidates for successful use of the Pavlik harness, and what approaches are best for those patients whose hips do not remain concentrically reduced despite appropriate treatment with a Pavlik harness.

How Do We Get There?

With the heterogeneity of current studies and difficulty in comparison, a systematic review of available evidence could be the first step to answer this question for us. Previous systematic reviews [3, 7] have looked at the factors that predict the outcome of Pavlik harness treatment. The existing data could be further explored to see if it is of sufficient quality to be able to stratify these risk factors. This risk stratification could then be validated with a prospective study. However, a prospective, likely multi-center, study to have adequate patients and homogenous data would be ideal. This could be undertaken under the auspices of the Pediatric Orthopedic Society of North America or the European Pediatric Orthopedic Society or alternatively collaborative working groups of like-minded individuals such as the International Hip Dysplasia

Institute. Alternatively this could also be accomplished using a registry system such as the arthroplasty registries that allow compilation of large volumes of data. Given the fact that there appear to be several variables that determine the success of harness treatment, creation of a nomogram, would make it easier to predict which patients would be appropriate for Pavlik harness treatment. For the patients likely to fail, we would need to further evaluate what the best form of treatment should be. Further studies could then compare different treatment methods to determine which one is the most efficacious. This would help with treatment planning as well as counseling the families about the risks, benefits and alternative treatment.

The use of the electronic medical records may facilitate this task by use of predictive analytical tools. Data sheets from all studies should be mandatory supplemental material to all publications in order to facilitate more meaningful comparative studies in the future.

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