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CORR Insights

CORR Insights®: The Femoro-Epiphyseal Acetabular Roof (FEAR) Index: A New Measurement Associated With Instability in Borderline Hip Dysplasia?

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Where Are We Now?

In their study, Wyatt and colleagues established the validity and reliability of a novel approach to the classification of joint instability in borderline hip dysplasia. True hip dysplasia is defined by a radiographic lateral center-edge angle (LCEA) of approximately < 20° and a borderline dysplasia between 20° to 25° [1]. Borderline dysplasia of the hip is difficult to recognize because multiplanar hip instability can be caused by any of several patterns of joint deformity.

Wyatt and colleagues compared the novel Femoro-Epiphyseal Acetabular Roof (FEAR) Index, which uses principles of bone growth to create a new radiographic parameter [2–5], with the LCEA and acetabular index. The FEAR Index was shown to have excellent reliability and it enhanced the authors' ability to distinguish unstable hips from stable hips with borderline dysplasia.

Similar to a patient's physical examination, the FEAR Index stresses the importance of ensuring proper radiographic standardized criteria are followed. Using the FEAR Index can help the clinician approach the patient with borderline dysplasia in a systematic way, much as one might want to use a systematic, well-organized physical examination. The FEAR Index is another tool the clinician can use (in addition to physical examination parameters suggestive of objective instability) when seeking to distinguish the unstable, dysplastic hip from the mildly dysplastic hip that is not clinically unstable.

Where Do We Need To Go?

Providing the patient with the proper treatment plan and accurate diagnosis in a timely manner is the primary goal in hip restoration and preservation. Wyatt and colleagues established a good outline for radiographic evidence of instability in a single plane, but

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osseous deficiency can occur in any of the three developmental ossifications that contribute to stability of the hip, which are effected in a dynamic three planar interaction.

How Do We Get There?

In order to corroborate and validate the FEAR Utility Index, future research should include multicenter studies with large cohort of patients. Inter-observer reliability must be established, which may prove difficult in multicenter studies, however Wyatt and colleagues provide the necessary guidelines to establish intra-observer reliability. Long-term prospective treatment outcomes studies will provide further evidence for the use of the FEAR Index. Until then, retrospective analyses can help determine its utility.

Future studies should also analyze the femoral torsion and the entire acetabulum for a complete analysis of multiplanar osseous deficiency and evaluation of their interactions. Incorporation of the physical examination findings will help identify and verify the clinically unstable hip with radiographic parameters. A common language and standardized technique for radiographic analyses and physical examination of the hip will advance our understanding of the borderline dysplastic hip.

The FEAR Index is a valuable tool to aid in defining a group of patients presenting with hip pain. As its utility broadens, more critical data will strengthen the scope of how we make treatment decisions. Combined with a thorough physical examination, stable versus unstable borderline dysplastic hips will receive the correct diagnosis and treatment plan.

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