The Broken Wing Sign: A Novel Clinical Test for Diagnosing Gluteus Medius Tears and Atrophy

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INTRODUCTION:
Gluteus medius tendon tears and associated muscle atrophy significantly impair patient function and quality of life, presenting diagnostic challenges, especially preoperatively. We developed and evaluated the Broken Wing Sign, a novel clinical test designed to detect gluteus medius pathology, assessing its accuracy compared to MRI and intraoperative findings.
METHODS: We prospectively assessed 75 hips (59 patients; mean age 69.5 years; 48 women) presenting with suspected gluteus medius pathology. The Broken Wing Sign involved patients lying prone, knee flexed to 90°, actively extending the hip; external rotation lag ≥10° indicated a positive result. MRI was used as the reference standard, categorizing tears and fatty infiltration severity (Goutallier grades). Diagnostic metrics (sensitivity, specificity, PPV, NPV, and diagnostic odds ratio [DOR]) were calculated.
RESULTS: The Broken Wing Sign demonstrated high diagnostic accuracy for identifying gluteus medius tears (sensitivity 81.8%, specificity 80.0%, PPV 91.8%, NPV 61.5%, DOR 17.8). Extreme external rotation (≥30°) indicated a tear with 100% specificity and PPV, albeit lower sensitivity (27.3%). The sign was highly sensitive for severe muscle atrophy (Goutallier ≥3; 88.0% sensitivity) and massive tears without fatty infiltration (100% sensitivity). External rotation magnitude significantly correlated with MRI tear severity and fatty infiltration ($r = 0.498$, $p<0.001$).
DISCUSSION AND CONCLUSION: The Broken Wing Sign is a valuable clinical examination tool for diagnosing gluteus medius tendon tears and associated muscle atrophy. Its strong predictive value for severe and massive tears supports its integration into preoperative assessment, guiding appropriate MRI utilization and surgical planning.