Lateral Femoral Condyle Pathology: A Systematic Review

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Introduction. Knee trauma impacting the lateral femoral condyle (LFC) may result in the lateral femoral notch sign (LFNS) or bone bruise/contusion findings indicates an impaction injury with potential damage to cartilage or bone. Despite historical associations with anterior cruciate ligament (ACL) tear, a comprehensive review is needed to explore LFC pathology associations with other injuries, long-term outcomes, and indications for procedures.

Methods. A systematic literature review following PRISMA guidelines was conducted. We searched PubMed, CINAHL, and Cochrane databases using specified keywords related to LFC pathology.

Results. This review encompassed 54 studies, five case reports, and one surgical technique paper. Diagnostic investigations revealed LFNS depth (1.0mm) as a reliable predictor of ACL injury, with deeper LFNS (>1.8mm) indicating high positive predictive value for concomitant ACL/ALL rupture. ACL injury rates varied among different LFC pathologies, including kissing contusion and bone bruise, with associations to cartilage outcomes, knee stability, and patient-reported outcomes. Concomitant injuries linked to LFNS, bone bruise, and femoral impaction were explored in 19 studies, revealing relationships with lateral meniscus injury, posterolateral corner injury, medial meniscal ramp lesion, anterolateral ligament injury, and medial collateral ligament injury. Four case studies demonstrated effective surgical treatment for LFNS (>5mm).

Conclusions. Various LFC pathologies, including bone bruise, LFNS, and BMELs, serve as diagnostic tools for ACL injury, exhibiting different rates among populations and injuries. These signs correlate with cartilage, knee stability, and patient-reported outcomes, as well as meniscus, ALL, and MCL injuries. Cartilage damage negatively impacts outcomes, while surgical treatments for LFNS (>5mm) shows positive results.