الدراسات العليا

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Degree: Master of Diagnostic Radiology

Title of Thesis: **Accuracy Of Dynamic Ultrasound Imaging In Detection Of Anterior Cruciate Ligament Injuries In Comparison To Magnetic Resonance Imaging And Knee Arthroscopy Findings**

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Summary

The anterior cruciate ligament (ACL) is the principal restriction of the tibia's anterior displacement relative to the femur and also acts as a restraint of internal-external rotation. It is also the most common knee ligament injury seen in radiology and orthopedic practice.

Arthroscopy is the gold standard for diagnosing knee problems, but it is invasive, expensive, and needs a day surgery admission. MRI is now the non-invasive gold standard for diagnosing knee problems, although it is time-consuming and expensive.

Currently, ultrasound is not widely used for the evaluation of ACLs since no simple and accessible way of directly inspecting the ACL by sonographic examination has been provided. There have been few studies to date that have evaluated the use of ultrasound for the diagnosis of an ACL injury.

The purpose of this study was to compare the value of ultrasound (US) in the diagnosis of ACL full and partial tears to magnetic resonance imaging (MRI) and knee arthroscopy results as the gold standard approach.

This prospective study was conducted in the Ultrasound unit and MRI unit of Radiology Department at Fayoum University Hospital, and included 30 patients with history of chronic knee trauma and complaining of knee pain or feeling of instability with movements.

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Patients referred from the orthopedic clinic to Ultrasound Unit for US examination of knee joint followed by MRI of the symptomatic knee in all patients, then referred again to orthopedic out-patient clinic to do Knee arthroscopy and correlate with U-S\MRI findings.

In our study, we made a differentiation between complete and partial ACL tear. we made a differentiation between complete and partial ACL tear. Non visualization and discontinuity of ACL fibers were considered indicator of a complete ACL tear. Thus, a complete ACL tear was seen on MRI in 15 patients (50%) and partial tear identified also in 8 patients (27%).

In our study, we have correlated the US and MRI findings with arthroscopy in 30 patients, we found that sensitivity and specificity of US were (71%, 87%) respectively in partial ACL injury and the sensitivity, specificity in complete ACL injury were (85%, 82%) respectively, moreover sensitivity and specificity of MRI were (87.5%, 91%) respectively in partial ACL injury and the sensitivity, specificity in complete ACL injury were (100%, 88%) respectively.

Our study shows that US is accurate in diagnosing complete ACL tears with a higher sensitivity for complete ACL tears compared with partial ACL tears (85% vs 71%).

Another important finding of our study is that the diagnostic accuracy of US approaches MRI accuracy in diagnosing complete ACL tears.