

Alternations Of Single Leg Landing Following Partial Medial And Lateral Meniscectomy. A Kinetic And Kinematic Analysis

Orthopaedics / Knee & Lower Leg / Joint Preserving Surgery & Soft-tissue Repair

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Background

It is well known that the role of the menisci in the knee joint is very important. Menisci have the role to transfer the loadings through the knee joint, they absorb shock and they improve the joint stability. Although the arthroscopic partial meniscectomy is a very common procedure in current orthopaedics, the literature regarding the post-operative functional and biomechanical outcomes remains limited. It has been reported that patients who undergo partial meniscectomies have higher incidence of osteoarthritis in the future. The shear forces into the knee joint are remarkably higher after lateral meniscectomy in comparison to the equivalent procedure to the medial meniscus. The time to return to pre injury sporting activities is reported to be significantly longer after lateral meniscectomy compared to medial meniscectomy.

Objectives

The aim of this study was to investigate the possible single leg landing alternations that occur to the lower limbs' biomechanics following arthroscopic partial medial and lateral meniscectomy

Study Design & Methods

Eight male patients (aged 28 ± 7.47) who underwent an isolated partial medial meniscectomy (17 ± 4.45 months post-op) and eight male patients (aged 27.7 ± 7.53) who underwent an isolated partial lateral meniscectomy (17.6 ± 4.22 months post-op) were recruited. A ten-camera motion analysis system and two force platforms were used to collect 3D data during single leg landings of jumps made from standing. Kinetic and kinematic data were collected from three trials. Data were averaged for each individual. A repeated measures analysis of variance was conducted to assess the impact of medial and lateral meniscectomy on lower limb biomechanics. Statistical significance considered to be 0.05.

Results

Both of study groups had significantly reduced maximum knee moments in the involved limb comparing with the uninvolved one ($p=0.002$). The affected limb of the patients who had medial meniscectomy showed reduced vertical ground reaction forces and higher

maximum knee angle comparing with the normal one ($p=0.007$ and 0.05 respectively). These findings were not present at the patients with the lateral meniscectomy. In the contrary the patients with lateral meniscectomy adopted a different strategy on the affected limb during single limb landing. They had significantly increased maximum ankle moment ($p=0.015$), which led to normal vertical ground reaction levels.

Conclusions

The patients following partial medial and lateral meniscectomy adopt different strategies during single leg landing. Specifically, patients who had lateral meniscectomy use an ankle-dominant strategy to shift demands away from the injured knee joint. On the other hand, patients with medial meniscectomy adopt a soft landing strategy. These differences acknowledge the clinical and rehabilitation differences between the two surgical interventions.