



Figure 3. Effect of injury and SB431542 on TGF- β gene expression. Bar \rightarrow $p < 0.01$.

Conclusions: This study is consistent with the hypothesis that endogenous TGF- β signaling is involved in gene expression and protein synthesis of PRG4 in response to mechanical injury. While injury significantly increased TGF- β gene expression, inhibition of the TGF- β type-I receptor suppressed PRG4 gene expression and protein release. Injury did not appear to affect the ability of the blocker to suppress PRG4 gene expression. Yet, there is a trend towards dose dependence of the ability of the blocker to suppress PRG4 protein release in the presence of injury. The PRG4 protein concentration in the conditioned medium of injured cartilage explants tracks closely with values in the literature ($\sim 0.1 \mu\text{g}/(\text{disc} \cdot \text{day})$).

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LOW-INTENSITY ULTRASOUND ENHANCES TENDON GRAFT- BONE INTERFACE HEALING IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION. A BIOCHEMICAL AND IMAGE ANALYSIS IN HUMAN

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Purpose: The present study investigates the effect of low-intensity pulsed ultrasound (LiUS) during ligation process on the healing at tendon graft-bone interface through biochemical and imaging analysis.

Methods: Sixty patients who underwent arthroscopically assisted anterior cruciate ligament (ACL) reconstruction using semitendinosus and gracilis tendon autograft were selected for the study. LiUS (200- μ sec bursts of 1 MHz sine waves with pulse repetition rates of 1 KHz and average intensity of 30 mW/cm²) was applied daily in 30 patients (study group) for 20 days, while 30 patients didn't receive LiUS (control group). Blood samples were collected pre-operatively and 1, 2, 3 and 6 weeks post-operatively. The serum levels of TGF-b1, IGF, OPG, sRANKL, procollagen I and NTx from both groups were measured using ELISA. Multiple Direction Computer Tomography (MDCT) in different time periods were used to monitor the progress of healing in both groups postoperatively. MDCT with MPR in 3 planes evaluated the direct integration by means of quantitative measurement of HU and qualitative evaluation of the degree of the cross sectional ossification.

Results: Analysis of the serum levels of all the factors showed statistically significant alterations in the study group compared

to the control group. Interestingly, IGF and OPG levels were found elevated, sRANKL was decreased and TGF-b1 exhibited a bimodal profile in the study group. Imaging analysis supported the biochemical findings, indicating a faster healing rate and a more efficient ligation process after ultrasound treatment.

Conclusions: Our results suggest that LiUS enhances the healing rate of the tendon graft-bone interface in ACL reconstruction, possibly by affecting the expression levels of significant genes

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SPECIFIC FACTORS INFLUENCE IMPROVEMENTS IN FUNCTION AND ACTIVITY LEVELS AFTER PARTIAL MENISCECTOMY

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Purpose: Partial meniscectomy is the current standard of care for torn menisci not suitable for repair. Arthroscopic partial meniscectomy is the most commonly performed orthopaedic surgical procedure. The purpose of this study was to determine what specific factors influence longevity of improvements in function and activity levels following arthroscopic partial meniscectomy.

Methods: Six hundred forty (640) knees which had undergone isolated partial meniscectomy were identified from a clinical database. One hundred ninety-three (193) knees had partial lateral meniscectomy, 342 had partial medial meniscectomy, and 105 had partial medial and lateral meniscectomy. Average age was 52 years (range, 15 to 79) with 207 females and 433 males. Patients were excluded if they had concurrent ACL reconstructions or microfracture for chondral defects. Lysholm function and Tegner activity scores were collected for a minimum of 8 years after the index partial meniscectomy.

Results: For all knees, Lysholm scores improved significantly from preoperative (54) to 1 year postoperative (76) ($p < 0.001$). Lysholm scores did not change from year 1 to year 5. At year 6, average Lysholm score decreased to 69, and by year 8, the score decreased further to 63. When comparing degenerative knees to non-degenerative knees, the non-degenerative group had greater improvement and maintained it longer. Medial meniscus patients maintained their improvement at 6 and 7 years while the lateral meniscus group showed less improvement and decreased at years 6 and 7. Anatomic location of meniscus tear (anterior, middle or posterior thirds) was not associated with changes in improvement of Lysholm or Tegner scores. Tegner activity levels improved significantly from preoperative (3.6) to 1 year postoperative (4.7) ($p < 0.001$). This improvement was maintained at years 2, 3, and 4. There was no significant difference between preoperative Tegner and year-5 Tegner scores (4.0) ($p > 0.05$). This same finding was also seen at years 6, 7, and 8. In degenerative knees, there was less improvement, and levels declined at years 6, 7, and 8.

Conclusions: Patients who undergo partial meniscectomy can expect 4 to 5 years of improved function and activity levels. Knee function continues to improve up to 5 years, but it decreases as activity levels decrease. Patients who delay treatment or have degenerative changes experience a decrease in function and activity levels sooner. Meniscectomy provides a short term improvement in function and activity levels, but long term improvement seems unlikely. Our findings confirm that specific factors such as which meniscus (medial or lateral) undergoes meniscectomy, chronicity of the tear, and preexisting degenerative changes might be expected to influence longevity of improvements after partial meniscectomy.