



## **Results of Transphyseal Anterior Cruciate Ligament Reconstruction Using Patellar Tendon Autograft in Tanner Stage 3 or 4 Adolescents With Clearly Open Growth Plates. Shelbourne KD, Gray T, Wiley, BV.**

**Background:** Drilling across the physes for intra-articular anterior cruciate ligament reconstruction is considered risky for skeletally immature patients.

**Hypothesis:** Skeletally immature patients with clearly open growth plates can safely undergo intra-articular anterior cruciate ligament reconstruction with patellar tendon autograft without suffering growth plate disturbance.

**Study Design:** Retrospective review of prospectively collected data.

**Methods:** Surgery involved drilling tunnels through the tibial and femoral physes, the bone plugs were placed proximal to the physes, and button fixation was placed on the cortex. Of 272 skeletally immature patients, 16 had clearly open growth plates. Tanner stage of physical development was evaluated. Follow-up evaluation included objective and subjective data.

**Results:** At the time of surgery, 7 patients were Tanner stage 3 and 9 were Tanner stage 4. Clinical follow-up (mean, 3.4 years after surgery) showed that the mean growth after surgery was  $11.7 \pm 4.2$  cm for boys and  $6.6 \pm 2.3$  cm for girls. No patients had growth plate disturbances, gross leg deformities, or gross leg-length discrepancies. Subjective results (mean 5.6 years after surgery) showed a mean total score of  $97.6 \pm 2.9$  for the modified Noyes survey and  $95.4 \pm 6.9$  for the International Knee Documentation Committee survey. All patients returned to competitive sports after surgery.

**Conclusion:** In 16 skeletally immature patients with clearly open growth plates who were Tanner stage 3 or 4, an intra-articular anterior cruciate ligament reconstruction was performed using a patellar tendon autograft with no gross growth disturbance; however, the surgical technique was meticulous for placing the bone plugs proximal the physes, and the graft was not over tensioned.

**Keywords:** anterior cruciate ligament (ACL); open physes; skeletally immature