0-4 mm). No patient had undergone or had revision surgery planned at the latest follow-up. We conclude that quadriceps tendon allograft is a suitable graft source for ACL reconstruction.

Randy S. Schwartzberg, M.D., Sean R. Dingle, M.D.

Arthroscopic Anterior Cruciate Ligament Reconstruction With Quadriceps Tendon Autograft—Minimal 4-Year Follow-up (SS-14)

Surgical reconstruction of the anterior cruciate ligament (ACL) is indicated in the ACL-deficient knee with symptomatic instability and multiple ligaments injuries. In the present study, we describe the clinical results of quadriceps tendon-patellar bone autograft for ACL reconstruction. From 1996 to 1998, the graft has been used in 38 patients. Thirty-four patients with complete final follow-up for minimal 4 years were analyzed. The average follow-up time was 62 (48 to 84) months. Thirty-two (94%) patients achieved good or excellent results by Lysholm knee rating. Twenty-six (76%) patients could return to moderate or strenuous activity after reconstruction. Twenty-eight (82%) patients had ligament laxity of less than 2 mm. Finally, thirty-one (91%) patients were assessed as normal or nearly normal rating by IKDC guideline. Twenty-five (73%) patients had less than 10 mm difference in thigh girth between their reconstructed and normal limbs. Thirty-two (94%) and Thirty-one (91%) patients could achieve recovery of the extensor and flexor muscle strength in the reconstructed knee to 80% or more of normal knee strength respectively. A statistically significant difference exists in thigh girth difference, extensor strength ratio, and flexor strength ratio before and after reconstruction. Our study revealed satisfactory clinical subjective and objective results at minimal 4 years follow-up. Quadriceps tendon autograft has the advantage of being self-available, relatively easier arthroscopic technique, and having a suitable size, making it an acceptable graft choice for ACL reconstruction. There is little quadriceps muscle strength inhibition after quadriceps harvest. There is quicker return to sports with aggressive rehabilitation. A quadriceps tendon-patellar autograft is a reasonable adequate graft choice to ACL reconstruction.

Chih-Hwa Chen, M.D., Shih-Wei Chou, Ph.D., Wej-Jer Chen, M.D., Chun-Hsiung Shih, M.D., Wen-Nung Ueng, M.D.

Quadriceps Tendon Anterior Cruciate Ligament Reconstruction (SS-15)

From April 1996 to August 2001, 302 patients underwent ACL reconstruction using a central quadriceps tendon autograft with a bone plug and bioabsorbable interference screw fixation. Fifty-seven patients were available for long-term follow-up. Associated injuries were 20 medial meniscal tears, 29 lateral meniscal tears, and 8 significant (grad 2 or higher) articular cartilage injuries. At an average follow-up of 44.4 months (range 8 to 101 months), patients were assessed for ROM, stability, swelling and pain. KT values were 0.3 mm/47 patients, 3-5 mm/5 patients, 5-10 mm/5 patients and >10 mm/0 patients. Average KT value was 1.04 mm. Five patients had pain at final follow-up while one patient had an effusion. Fifty-four patients lost 0°-3° of extension and four lost 3°-5° of extension. No patient lost more than 5° of extension. No arthrofibrosis was seen in the 54 patients in the 0°-3° extension loss group, 3 patients in the 3°-5° extension loss group, and no patients in the over 5° extension loss group. IKDC scores at follow-up were 31 normal, 16 nearly normal, 8 abnormal, and 2 severely abnormal. There was no donor site morbidity. Good and excellent results were obtained in 55 or 57 patients. We feel that the central quadriceps tendon graft offers an excellent reconstruction option which yields excellent results and stability equal to bone–patellar tendon–bone graft. Patient satisfaction was very high.

Walter R. Shelton, M.D., Shaun Holt, M.D.

Residual Pivot Shift After Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon Autograft (SS-16)

This retrospective study was performed to determine the clinical significance and the causes of residual pivot shift after ACL reconstruction using central quadriceps tendon autograft. Methods: 93 knees of 92 patients who underwent an arthroscopic ACL reconstruction using quadriceps tendon autograft were reviewed with a minimum two years of follow-up. Clinical results were evaluated by Lysholm score and Cybex dynamometer. Anterior laxity was assessed using KT-2000 arthrometer. Patients were classified into three groups by postoperative pivot shift and Lachman test; Group 1 (all negative), Group 2 (negative in Lachman and positive pivot shift), Group 3 (all positive). The radiographic analysis was performed by 1) the angle between tibial and femoral tunnel on plain A-P image, 2) the angle between tibial tunnel and anterior tibial cortex on lateral image, 3) the femoral and tibial tunnel location using Aglietti method. Postoperative knee MRIs were obtained and 1) the angle between joint line and the graft on sagittal and oblique coronal view, 2) the angle between Leo's line and femoral tunnel on axial view were measured. Results: The number of patients in each group was 75, 8, and 10 respectively. Patients in group 1 showed greatest im-