

1. John Joyce Award Finalist LATERAL MENISCUS TRANSPLANTATION: THE PITTSBURGH EXPERIENCE. *Yram J. Groff, MD; Christopher D. Harner, MD*

Purpose: Meniscal transplantation has been proposed to delay progressive degeneration and pain following meniscectomy. Replacement of the lateral meniscus presents a greater technical challenge due to increased mobility of the lateral compartment. The purpose of this study was to report the clinical results of patients who underwent isolated lateral meniscus transplantation.

Methods: From 1993 to 1998, 20 patients underwent isolated lateral meniscus transplantation. One patient could not be located and one had moved out of the country. 16 of the remaining 18 patients completed a series of health status questionnaires (Activities of Daily Living Scale [ADLS] & Sports Activity Scale [SAS] of the Knee Outcome Survey, Lysholm Knee Scale [LYSH], IKDC, SF-36) and returned to the clinic for assessment of range of motion, functional strength (single leg hop & vertical jump) and x-rays (PA flexion weightbearing, lateral and standing long cassette). Average length of follow-up was 3.8 yrs (2.1-5.5). Average age was 27 yrs and 56% were males.

Results: All patients reported improvement following surgery: 58% were greatly improved & 42% were somewhat improved. No patients reported themselves to be worse or unchanged. The average ADLS score was 80, the SAS score was 75 and the LYSH score was 82. The SF-36 Physical Components Summary score was slightly above the population average (PCS=53), reflecting a higher than average level of physical well-being compared to the population as a whole. 92% of patients rated their level of function and activity as normal or nearly normal. 42% reported pain with light sporting activities (i.e., running, turning and twisting) but only 17% reported pain with activities of daily living. Compared to the unaffected knee, the average loss of flexion was 11° and the loss of extension was 3°. Single leg hop and vertical jump, expressed as a percentage of the contralateral normal limb were 96% and 97% respectively. Radiographs were evaluated for lateral joint space narrowing using a digital micrometer and no decrease compared to the pre-operative film was found in any knee.

Conclusion: Lateral meniscus transplantation is a viable therapeutic alternative in carefully selected patients. All patients reported improvement 2 to 6 years following surgery. Resumption of activities of daily living was more predictable than return to sports.

2. John Joyce Award Finalist ARTHROSCOPIC EVALUATION OF CARTILAGE REPAIR FOLLOWING AUTOLOGOUS CHONDROCYTE IMPLANTATION (ACI). *John A.L. Hart; Joanne Paddle-Ledinek*

PURPOSE: To evaluate the repair of articular cartilage defects in the knee joint treated by ACI using arthroscopic assessment.

METHOD: 106 articular cartilage defects in 79 knees of 77 patients were treated by ACI. The autologous chondrocytes were injected beneath a peri-osteal flap (Brittberg et al, 1994). 43.5% of the lesions involved the patella, 35.2% the femoral condyles, 16.7% the trochlea, and 4.6% the tibial condyles. Average defect size was 254.65 mm². 20% of knees had more than one defect. Associated biomechanical procedures were carried out in 88.7%. Patients were scheduled for review arthroscopy and removal of the metal implants at nine months following implantation. The ICRS rating score was used to assess articular cartilage repair.

RESULTS: 70 lesions, 58 knees and 56 patients have been assessed; 4 eligible patients have not been assessed arthroscopically. The average ICRS repair score (maximum 12) was as follows: tibial con-

dyle 11.5, 4 defects; patella 11.3, 32 defects; femoral condyle 11.0, 23 defects and trochlea 10.7, 11 defects. Synovitis was markedly reduced in all knees with well healed defects. Eleven patients developed adhesions between the peri-osteal graft and the synovium. Ten of these occurred on the patella and caused a patellar click in some patients during flexion which was relieved by arthroscopic resection. Incomplete healing occurred in one patient with a wound dehiscence, in two following a fall in the post-operative period, and in one patient with a non-contained defect. Biopsies at arthroscopy showed predominantly hyaline cartilage.

CONCLUSION: ACI is an effective method of repairing articular cartilage defects. In this series the results for the patella have matched those for the femoral condyle. This is attributed to the simultaneous biomechanical correction of patello-femoral dysplasia. Stabilisation of the articular surface results in resolution of synovitis.

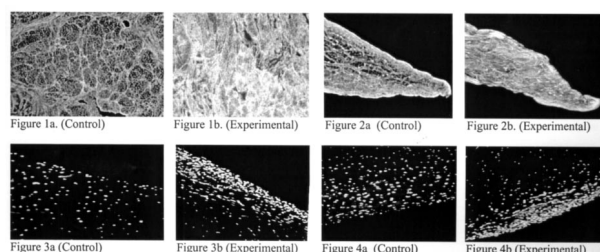
3. John Joyce Award Finalist CHANGES IN THE CELLULARITY AND SPATIAL DISTRIBUTION OF TYPE VI COLLAGEN IN THE MENISCUS OF ACL-DEFICIENT CANINE JOINTS.

Manuel Leyes, MD, PhD; Cahir A. McDevitt, PhD; John R. Matyas, PhD; Mark E. Adams, MD

Objective: To investigate the changes in cellularity and type VI collagen spatial distribution in the canine meniscus after ACL section. Our hypothesis is that type VI collagen plays a role in the remodeling of the meniscus after injury.

Methods: Skeletally mature dogs underwent section of the ACL with the contralateral knee serving as control. Dogs were sacrificed at 4, 10 and 32 weeks after surgery, with 8 dogs in each group. The midsection of the medial meniscus of operated and non-operated joints was harvested and sectioned in the coronal plane. Type VI collagen and the nuclei of meniscal cells were located with a monoclonal antibody and Hoechst dye, respectively.

Results: The results were consistent at the three time intervals. In the experimental menisci from ACL deficient joints (Fig 1b and 2b), the staining for type VI collagen was enhanced and more disorganized than that evident in control tissues (Fig 1a and 2a). This change was observed throughout the whole meniscus, not only at the sites of the tears. An increase in the number of cells beneath the femoral (Fig 3b) and tibial surfaces (Fig 4b) in the outer third of the experimental menisci was also evident in the menisci of the ACL deficient joints.



Conclusions: Our findings suggest that the meniscus responds to ACL insufficiency by an increased cellularity in the superficial zones and an increased and spatially altered deposition of type VI collagen in the extracellular matrix. This remodeling response was evident as soon as 4 weeks after surgery.

4. John Joyce Award Finalist PATELLA HYPER-PRESSION SYNDROME. ARTHROSCOPIC REALIGNMENT. Luciano Quevedo, MD; Eduardo Ottolenghi, MD; Gustavo Cueto, MD; Alberto Pienovi, MD

Introduction: Pain behind the anterior patella is clinically frequent in the athletic group, especially in adolescents. Patellar hyper-pressure is one of the most frequent causes. Key factors for indicating and prognosing this pathology are: time of appearance of symptoms, radiological displacement and inclination, and the level of chondromalasia and subchondral lesion.

Method: This is a prospective multicenter study of the arthroscopic treatment, clinical results and evaluation. A hundred and eighty-six cases were studied. Eighty-three patients (44.62%) were bilateral, with a follow-up of 34.2 months. The average age was 20.6 (14 to 30). From the cases evaluated, 148 (79.56%) were women and 38 (20.43%) were men.

The arthroscopic treatment consisted on the release of the external ligament and a combined arthroscopic shift of the internal complex, the steps of this procedure are described as simple and technically effective. The thermal internal shrinkage was used in 98 (52.68%) of the cases with radiofrequency as a complement.

Results: Arthroscopies were performed in an ambulatory way and with local anesthesia. The post-operative began immediately with rehabilitation and the return to sports activity occurred within an average of 17.8 weeks. The evaluation was done according to the UCLA classification and the results were excellent or very good in 162 cases (87.10%), 18 patients (9.68%) referred to some pain and disability to practice sports and 6 (3.23) could not return to sports.

Discussion: Anterior knee pain, caused by patellar hyper-pressure is a frequent and incapacitating lesion in the young sports population, principally in the female group. The conclusion is that the arthroscopic plication of the internal retinacular complex, combined with a release of the external retinaculum, achieves a better distribution of pressure and forces over the articular surfaces of the patella with good clinical results.

5. John Joyce Award Finalist SECOND-LOOK ARTHROSCOPY OF THE MULTI-STRANDED HAMSTRING TENDON GRAFT FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION. Yuki Yoshi Toritsuka, MD, PhD; Masayuki Hamada, MD, PhD; Ken Nakata, MD, PhD; Konsei Shino, MD, PhD

PURPOSE: To clarify the fate of the intra-articularly transplanted multi-stranded tendon grafts for ACL reconstruction.

METHODS: The subjects were 120 knees in 117 patients aged 24 ± 8 who had consented to undergo 2nd-look arthroscopy at the time of hardware removal after endoscopic ACL reconstruction with 3-5 strand autogenous hamstring tendon graft using the drill hole technique. The mean period from the reconstruction to the 2nd-look was 17 months, ranging from 5 to 51 months. All the patients had a full range of motion and no complaints of subjective instability. Lachman test were negative in 105, trace in 11 and mildly-positive in 4 knees with a firm endpoint. The mean side-to-side difference at manual max. force in anterior displacement by KT-1000® was 1.2 mm, ranging from -1 to 4 mm. Arthroscopic evaluation was performed focusing tension and appearance of the graft. Chi-squared test and Mann-Whitney-U test were used for statistical analysis.

RESULTS: As for tension, 108 grafts (90%) were evaluated taut, while 12 (10%) were lax. The percentage of lax grafts tended to increase with time, while no statistical significance was found (fig.1). The 96 grafts (81%) appeared thick, while 24 (19%) showed partial tear

of 25 to 50%. The incidence of partial tear in the older grafts tended to be less than that in the younger ones, while there was no statistical significant difference (fig.2). The patients with lax grafts showed statistically greater KT values, while those with partially torn grafts did not.

Fig.1 . Tension of the grafts

	Taut		Lax	
	Count	Percentage	Count	Percentage
Less than 1 year	30	(95%)	2	(5%)
Between 1 and 2 years	41	(89%)	5	(11%)
More than 2 years	27	(84%)	5	(16%)

Fig.2 . Appearance of the grafts

	Thick		Partial tear	
	Count	Percentage	Count	Percentage
Less than 1 year	26	(61%)	16	(39%)
Between 1 and 2 years	31	(67%)	15	(33%)
More than 2 years	24	(75%)	8	(25%)

CONCLUSIONS: Twenty-four percent of the multi-stranded tendon grafts showed looseness / partial tear arthroscopically in the clinically stable knees.

SIGNIFICANCE: The subclinical partial tears or looseness of the grafts in this procedure may be the problem in the future.