

## **June 01 newsletter Editorial**

I was looking through the database of images for the burred K wire for the article below. Now I have 1,450 images in that clinical ACL folder. I use ACDSee to search the thumbnails on the server, which is still a little slow to go through that many images, but slightly better than the image access program. Image access works better to search the database, but you have to enter all the keywords to perform the search. That is time-consuming grunt work. But, what struck me is how much the imaging has improved in just the past couple of years. The early images were small, low resolution and not well-centered etc. I was also going through some pictures like the one below, and I had the same feeling about the landscape pictures. Digital photography has grown up and is now a force to challenge the old school of film photographers. That means you, PW.

### **ISAKOS**



The Chateau Chillon, Montreux Switzerland, where Roli Jakob hosted a medieval banquet that everyone will remember.

This was one of the best international meetings that I have attended in a long time. The venue was extraordinary, the papers were comprehensive, the symposium educational and the speakers informative and entertaining.

### **Summary of the papers from ISAKOS**

#### **The Pittsburgh experience of lateral meniscus transplantation**

Chris Harner presented the clinical outcome on 20 patients over 3.8 years follow up with lateral meniscus transplantation. The authors used fresh frozen nonradiated tissue fixed with sutures and a bony bridge technique. They use a small arthrotomy to insert the graft.

The results were:

IKDC 92% normal or nearly normal

No patients were worse after the procedure.

There was no significant joint space narrowing measured over time with standing x-rays. Functional testing shows normal or nearly normal with ADL'S. 42% had mild pain with sports activities, but only 17% had pain with ADL'S.

The indication for lateral meniscal transplantation is a symptomatic patient with a previous meniscectomy and relatively intact articular cartilage.

### **Patellar hyper pressure syndrome in athlete's – Alberto Pinnovi**

The purpose of this multi-center study is to report the outcome with 185 cases of arthroscopic realignment.

The procedure was done with local without the tourniquet. The patella was debrided with a shaver, a medial plication was done with 4-6 sutures (3 cm) and electro surgery thermal shrinking in 56%, and a lateral release was performed with electrocautery.

Rehab was started in 2 days. Crutches were used for pain only. The return to sports activity was in 4 months.

The results:

87% excellent results

10% fair results

3% poor results

This is an easy procedure with low morbidity and with good initial results. But does this last over time? The medial shift of the patella increases the Q angle and this results in an increase in the lateral pull.

### **ACL reconstruction with hamstrings – Kensei Shino**

The purpose of this study was to clarify the fate of the hamstring graft. The study was a second look procedure in 153 patients at time of hardware removal. The mean time of the second look was 17 months post op. The fixation of the hamstring grafts was with the endobutton. The second look also evaluated the meniscus repair. The pivot shift and Lachman test were negative in 87%.

The grafts were arthroscopically evaluated for tension and appearance.

66% were normal – 24% had partial tear and half of those had a substantial tear.

These patients were clinically successful and not associated with laxity. Only 4% had a pivot shift test. The partial tear of the graft may be due to uneven tension in the strands or dynamic impingement on extension by the front of the notch.

This partial tear may be a problem in the future.

### **OCD treatment with ACT treatment – Lars Peterson**

OCD is an unstable fragment with cartilage separation.

Indications for ACT depend upon the depth of bony defect. Up to 8 mm in small lesions and only 6 mm in large defects are treated. The larger deeper defects need bone graft either in one stage – the sandwich technique, or 2 stage with bone graft initially, followed by ACT.

Technique of the preparation of the small defects of depth of 6-8 mm

Prepare the base and transfer the periosteum and cells in the usual fashion.

The sandwich technique for the large deep defects is the one stage procedure

Under cut the subchondral bone plate and drill the base to get the mesenchymal cells, place the bone graft in the base, cover with periosteum, then place another

periosteal flap over this layer. The chondrocytes are inserted between the 2 layers of the periosteum.

42 patients in study – most in the medial femoral condyle, 2-16 cm in size  
14 patients follow-up for 11 years with 86% good and excellent results. Only 2 patients were considered to be a failure.

The treatment results do not seem to deteriorate over time

### **Canadian Orthopedic Association 46<sup>th</sup> Annual meeting – London On.**



The 'Team'; Sandy Kirkley and I after the ACL reconstruction demo.

Everything, except the weather, cooperated for the Canadian Orthopedic meeting in London, Ontario. The AV was outstanding, and they even accommodated me when I gave them my empty jewel CD case. I had left the CD at home in another computer and I was giving the presentation in 15 minutes! So much for having confidence in the computer guru. Sandy Kirkley and I did a live demonstration of an ACL reconstruction with hamstrings. The audience had touch pads, and could be polled on every aspect of the procedure. How many would scope the knee first before harvesting the graft?, how many would repair this meniscus ?, how many would do a bony notchplasty? etc. I think that this is an excellent way to cover many controversial aspects of ACL surgery. It is amazing that most of us are pretty much on the same page for ACL reconstruction. Too bad the shoulder guys can't say as much.

**The Sports session** – Chaired by Rich Hawkins and Paul Wright

#### **Tunnel Widening in Hamstring ACL reconstruction**

This study has been previously reported, and presented as a poster at the academy. The paper was not actually presented, but was discussed and quoted. Tunnel widening was compared with endobutton, cross pin fixation with bone mulch screw, BioScrews and metal screws. There was more tunnel widening with the BioScrews aperture fixation. The message is that there must be another factor, that as yet, we don't understand. As with the other studies, the tunnel widening did not correlate with the clinical outcome. I think that one of the

explanations was that the bioabsorbable screw is measured as part of the tunnel, and is not in fact tunnel expansion.

Tunnel widening

BioScrews - 122%

Metal screws – 89%

Bone mulch screws 76%

Endobutton – 36%

### **MRI Analysis of Anatomic Variables In the Etiology of ACL injuries in Female Athletes** – Kevin Willis Sandy Kirkley Peter Fowler

Kirkley et al used the MRI to measure the notch width and unlike Shelbourne's study, showed no relationship to increased ACL injury in females. However, the smaller x-sectional area of female ACL did relate to an increased ACL injury rate.

### **Hamstring ACL reconstruction fixed with BioScrews: 2 year results** Ari

Pressman Don Johnson

The 3-5 mm side to side difference by KT measurement was 27% without any additional femoral fixation or tunnel dilation. The improvements to using the screw alone is to use an endopearl, and dilate the tunnels. The tunnel widening seen in 20% of the cases did not correlate to the outcome or the clinical measured laxity with the KT. The tunnel widening was seen in both tunnels. This makes the aperture fixation theory a little weak.

### **Intra-articular Drain versus no Drain After Arthroscopic ACL reconstruction: A prospective randomized clinical trial** Bob McCormack

The use of a post op drain reduced the hemarthrosis in the first week, but the outcome was the same with or without the drain. Based on this study, they recommended no drain for ACL reconstructions. This also eliminates the inconvenience of the patient returning for the pulling of the drain the next day

### **Patient Administered Bupivacaine Infusion Following ACL reconstruction: Extra-articular analgesia directly into the infra-patellar fat pad**

Bill Stanish, Hall Chew

The drain for the pain pump was put into the fat pad through the defect in the patella tendon harvest site. The 0.5% marcaine showed the best pain relief, compared to .25% marcaine. There were no controls and the study was not randomized. This is yet another study to recommend the use of local in and around the knee when doing ACL reconstruction. Of course, if you did hamstrings, you wouldn't have that big defect to fill up with local.

### **A prospective randomized clinical trial comparing biodegradable meniscal arrows to inside out suturing for meniscal repair.** Sandy Kirkley

This was a randomized clinical trial with multiple surgeons showing that there was no significant difference in outcome between sutures and arrows for meniscal repair.

### **Meniscus repair and ACL reconstruction – Johnson/Pressman**

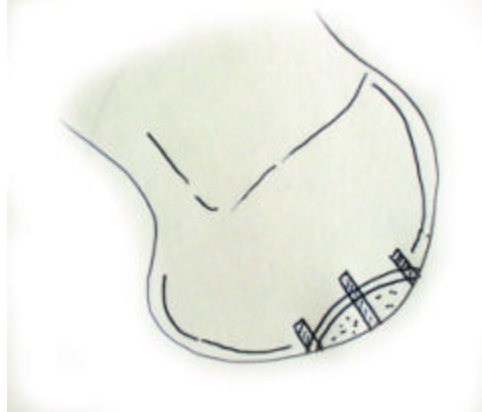
This was a retrospective review of meniscal repair showing the failure rate for bioabsorbable fixators was 4%, for hybrids 12% and for sutures 25%. The repair rate doubled in the mid 90's with the introduction of bioabsorbable meniscal fixators. The increased use of these fixators did not adversely affect the repair rate. In fact, with the judicious use of the fixator, they had the best results. The fixator in this series was only used for small tears in the posterior horn of the meniscus.

The patients who left the OR with a normal meniscus was only 44%, compared to Shelbourne who had 60% of chronic ACL reconstructions leave the OR with a normal meniscus. Shelbourne has shown the results at 10 years depend upon the state of the meniscus and chondral surface at the time of the index OR. If the patient leaves the OR with normal meniscus and articular surface, in 97% of the cases the x-ray will be normal at 10 years.

### **Autogenous osteochondral graft (mosaicplasty) for unstable OCD lesions**

Tony Miniaci, Graham Tytherleigh-Strong

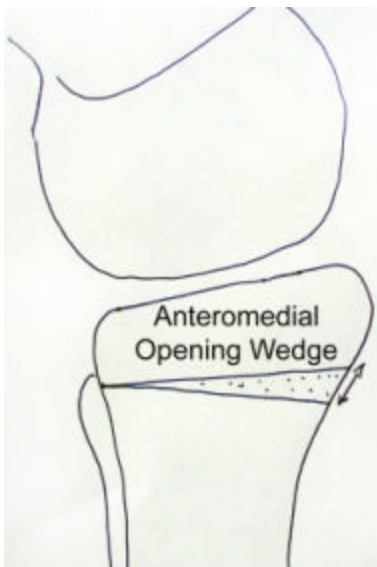
This is a unique way to fix the unstable OCD without metal. 11 patients with unstable OCD fragments were treated with multiple mosaicplasty plugs. The minimum number of plugs is 3, the average was 4.5 plugs of 4.5 mm diameter. The one plug is placed centrally and the other 2 on the edge of the lesions. The central plug stabilizes the fragment and the peripheral plugs help to heal the fragment back to the normal bone. By 6 months follow up all the patients were pain free and by 9 months had MRI evidence of healing.



### **The effect of opening wedge high tibial osteotomy in the PCL deficient knee – Peter Fowler.**

This cadaver study showed that an opening wedge osteotomy reduced the posterior translation of the tibia in the PCL deficient knee. The 10 mm opening wedge increased the posterior slope by 12°. This reduced the posterior translation when the PCL was cut, at the increased angle of knee flexion from 60-75°.

**Illustrative case of PCL deficiency.**



The diagram on the left demonstrates the concept of the anteromedial opening wedge and how this may prevent the posterior subluxation of the tibia in a PCL deficient knee. This is particularly beneficial when the patient has a varus knee due to medial compartment osteoarthritis. The x-ray on the right may be an ideal candidate for this anteromedial opening wedge osteotomy. The patient has had 3 attempts at ACL reconstruction and one attempt at PCL reconstruction, all without much success. He now has 24 mm of total ap displacement, with about 12 mm of posterior tibial translation measured on the stress radiograph. On the standing view, there is medial joint space narrowing secondary to medial compartment osteoarthritis. Maybe it's about time we look to a bony correction rather than any further soft tissue procedures.

In this patient, will the increased posterior tilt aggravate the associated ACL laxity? If this was a concern in the follow up, then consideration could be given to an ACL reconstruction.

### **Poster presentations – Sports Medicine**

#### **Combining Interference screws with the endobutton in soft tissue graft fixation – David Otto, Anthony Lu, James Rasc**

Hamstring grafts were fixed in a porcine model with 3 combinations and tested to failure in a MTS machine at 50 mm/min

<b>Fixation</b>	<b>Ultimate Load to Failure</b>
RCI screw	516N +/- 51
Endobutton with 2 #5 Ethibond	468N +/- 55
Combination of screw and endobutton	588N +/- 52

The conclusion was that the combination of screw and endobutton provides the best fixation. He has since repeated the study with a closed loop endobutton and the difference was not significant. The short closed loop endobutton probably does not need any additional fixation. This is a technique that you might consider if you have to use a long 40mm close loop endobutton.

### **Arthroscopic Debridement of Osteoarthritis of the Knee: A Critical Literature Review**

Manfred Koo, Borna Mesami J. Rod Davey, Nizar Mahomed

The conclusion of this study, which was a review of the literature, was that there was no evidence to support the efficacy of arthroscopic debridement of the knee for osteoarthritis. This is supported by the clinical study presented at the AAOS this year that showed that arthroscopic debridement was no better than a sham operation. OK folks, stop scooping those degenerative knees, except maybe for those with mechanical symptoms.

### **Comparison of the Load to Failure of a Cannulated Tack (Suretac II) and a suture anchor (Mitek) in Rotator Cuff Repair**

Anthony Miniaci Steve Myertrhall, Graham Tytherleigh-Strong, Alan Hirahara

Miniaci has reported good clinical results using the Suretac (sugar tack) for rotator cuff repair. He emphasizes that the tack must be inserted at a 45\* angle to adequately fix the tissue.

This lab study simulated a rotator cuff repair with the tacks and anchors on cadaver shoulders. The mean load to failure of the Suretac was 247N+/- 68 and for the Mitek anchor was 215N +/-69. The difference was not statistically significant. At time zero the fixation for the Suretac is equivalent to the suture anchor.

### **A Gender Comparison of Hamstring Graft Diameter.**

Sandy Kirkley et al

The size of the composite hamstring grafts was reviewed in 121 cases of ACL reconstruction. The average size of the female grafts was 6.7mm and the males were 7.6mm. The question arises from this is whether the smaller hamstring graft is adequate for ACL reconstruction. In a study presented as a podium presentation, females had a smaller ACL, so maybe they only need a 6 mm graft.

### **Patient self-assessment of Symptomatic and Functional Disability Associated with Meniscal Injury**

Moreno Morelli, Geoffrey Dervin

The purpose of this study was to determine which symptoms were most indicative of meniscal tears. Just prior to arthroscopy of the knee, patients were asked to complete an itemized questionnaire rating symptoms and functional disability. The results showed that subjective locking and sharp stabbing pain together with a functional disability with squatting, jumping and pivoting were most commonly associated with meniscal injury.

### **The Familial Predisposition Towards ACL tears**

Peter Fowler et al

Questionnaires were given to patients with ACL tears to seek information about ACL injuries in siblings, first cousins, aunts, uncles, children and parents. The results were that there was a substantially higher incidence than previously reported, indicating a familial predisposition to ACL injury

## **The Effect of Endobutton Fixation on the Femoral Tunnel in Hamstring ACL reconstruction: A clinical analysis of the Bungy Effect**

Bill Grana, Mark Burman

In a retrospective review of 26 ACL reconstructions at 17 months the degree of femoral tunnel expansion was 2.7mm on the ap and 2.4 mm on the lateral. This tunnel widening did not correlate with any outcome measurements such as laxity, Tegner or Lysholm scores. The conclusion was that the endobutton was associated with tunnel expansion but this did not affect the clinical outcome.

## **Autograft versus Synthetic Ligament for ACL reconstruction**

Nic Duval et al

The autogenous patella tendon graft was compared to the LARS ligament in a prospective randomized trial. The LARS group showed better instrumented measurements in the 24 months of follow up. There was no subjective difference using the KOOS and the IKDC assessment at 24 months, although at 12 months the LARS group scored better. The conclusion was that the LARS was an option for ACL reconstruction when the patient wanted to return to early high level of activity.

## **Multiple Ligament Reconstructions in Knee Dislocations using LARS synthetic ligaments**

Pierre Ranger et al

This was a retrospective evaluation of 27 knee dislocations that were treated by ACL/PCL reconstruction using the LARS synthetic ligament. The evaluation was by Lysholm – 76 and Telos stress x-ray measurement. The anterior laxity was 4 mm and posterior laxity 6 mm, measured by stress radiography. There were 3 stiff knees requiring further treatment. The conclusion was that the LARS ligament reconstruction of both cruciates was a viable option of internal fixation of the dislocated knee.

## **Practical Tip**

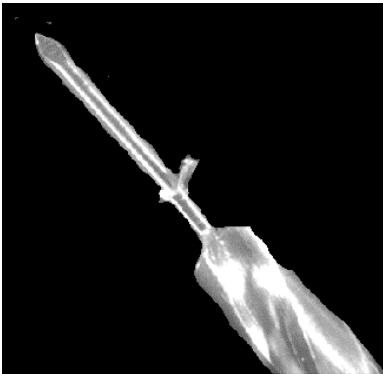
**Locating the Site for the incision for meniscal suture repair**



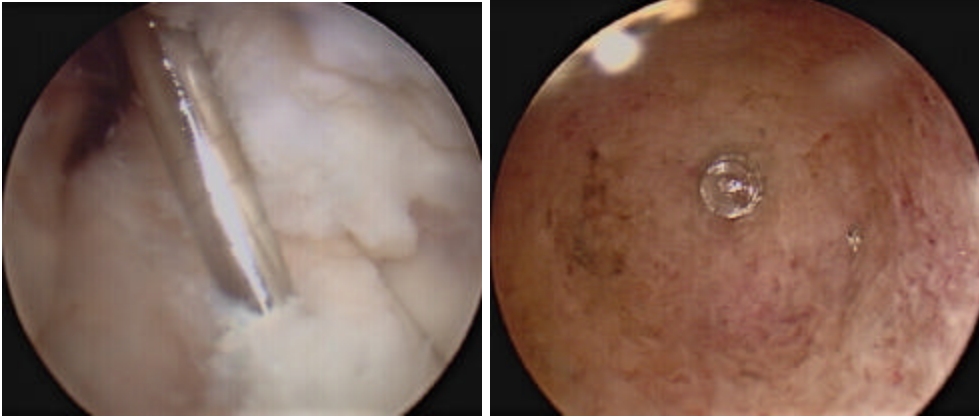
In order to make the incision in the correct position, use the scope to place the tip of the meniscus hook under the meniscus in the position of the meniscal tear. This can be palpated under the skin. The 2-3 cm long incision is made just posterior to the MCL. The subcutaneous tissue is dissected and the superficial fascia is divided. The tip of the hook can be felt if the hook is rotated. The suture needles will come out in the middle of this incision. The common mistake is to make this incision too proximal. If the hook is placed under the meniscus, this will put the incision in the correct position.

### **Complication**

#### **How to bail out of the broken wire in the tunnel**



The burred k-wire caused by the drill bit pushing against it at an angle. Usually the lack of resistance to the forward progress and the metal debris coming out around the drill bit alerts you to the problem. You then quit at this stage and remove the drill bit. But, what happens if you don't quit drilling?



This is the view inside with the k-wire in the normal position. The right photo is the k-wire broken off in the tibial tunnel. The scope is looking up the tibial tunnel from the outside. How do you get the broken k-wire out of the tunnel?



With the scope in the tunnel, the 4.5 mm drill bit can be inserted over the end of the broken k-wire. The small drill bit is pushed into the joint and the broken wire removed. A new k-wire is inserted and the reaming and dilation carried on in the usual fashion.

### **ACL reconstruction in the skeletally immature patient**

The literature (Arnoczky) showed minimal physal change when drilling an 8 mm tunnel through the growth plate and filling the tunnel with soft tissue. The conventional wisdom now is to reconstruct the pre-pubertal active athlete who has had an ACL injury, to prevent damage to the meniscus and articular surface. In the past, it was felt that conservative bracing and activity modification was the safest treatment for the youngster with an ACL tear. Aichroft reviewed his results of his conservative treatment of 23 patients in the 80's. The overall results were disastrous, with recurrent giving way, and meniscal and chondral injuries. In the 90's, he treated 55 children with ACL reconstruction using hamstrings. 6 of these patients were pre-pubertal. 77% were grade A and B on the IKDC scale.

I saw a patient in follow up in the office this week who had an ACL reconstruction using hamstrings when he was 8 years of age. JK is an 11 year old hockey player who tore his ACL down hill skiing 3 years previously. He underwent an ACL reconstruction with a 4 bundle hamstring graft

fixed with an endobutton on the femur and a button on the tibia. There was no meniscal or chondral damage at the time of the ACL reconstruction.



This is the 3 year post op x-ray view on the left and the pre-op view on the right.



The leg lengths are equal, with no angular deformity. He has grown about a foot. His IKDC 2000 score is 94. He plays all sports without a brace and without symptoms. I think that most of us would agree this is the treatment of choice compared to prolonged brace treatment and activity modification until the end of his growth.

## Upcoming Events

### Learning Center courses –Chicago - Contact AANA

- ?? **Advanced Shoulder**, Course 816, June 8-10  
Wesley M. Nottage, M.D., Felix H. Savoie III, M.D., and Anthony A. Romeo, M.D.
- ?? **Comprehensive Knee**, Course 803, July 20-22  
Donald H. Johnson, M.D., Roger V. Larson, M.D., and Marc A. Asselmeier, M.D.
- ?? **General Shoulder**, Course 804, August 3-5  
Howard J. Sweeney, M.D., Christopher A. Aland, M.D., and Larry D. Field, M.D.
- ?? **Wrist & Elbow**, Course 822, August 18-19  
James C. Y. Chow, M.D., William B. Geissler, M.D., Daniel J. Nagle, M.D., and Felix H. Savoie III, M.D.
- ?? **Hip**, Course 830, September 14-16  
J. W. Thomas Byrd, M.D., James M. Glick, M.D., Joseph C. McCarthy, M.D., and Howard J. Sweeney, M.D.
- ?? **Foot & Ankle**, Course 821, September 22-23
- ?? **Comprehensive Knee**, Course 805, October 5-7
- ?? **Advanced Shoulder**, Course 818, October 19-21  
Stephen S. Burkhart, M.D., Joseph C. Tauro, M.D., and J. Emory Chapman, M.D.
- ?? **General Shoulder**, Course 806, November 2-4 R.  
Michael Gross, M.D., and Stephen C. Weber, M.D.