

Practical Arthroscopy Newsletter No 2, 2006



Editorial

The double double frenzy.

It is like ordering fancy coffee, will that be a double latte, or double ACL? We now have double bundle PCL, double bundle ACL, and double row rotator cuff repairs. Do we really need these anatomic reconstructions? What really needs to be done is a randomized trial to compare the 2 different operations. I also feel that there is probably an indication for the more anatomic procedure, but we just haven't identified the right patient. Not everyone needs double bundle ACL reconstruction.

Arthroscopic Surgery 2006 – Metcalf meeting Sun Valley 4-8 Feb 2006



Fig 1 The Sun Valley Inn.



Fig 2. The well groomed hills of River Run on Baldy Mountain.

This was my first invitation to the Metcalf meeting, hosted by Bob Burks. He does a great job in the organization of speakers and topics, but particularly with the discussion sessions. He presents cases and solicits opinions from the panel. He also involves the audience, and addresses their questions. This was a good crowd, almost 350 participants, most of who were young, and fit, and were obviously there to ski. I went down the registration list, and hardly knew anyone. The skiing was outstanding! This was the best snow year in Sun Valley in 20 years, with 200 inches over most of the mountain. The runs were groomed to perfection, with no bumps on the routine runs. It was just like a carpet. I rented new short shaped skis, and hired a guide to get used to the mountain. It was the best skiing that I have had in years. I did take one morning to skate ski with Steve Howell. I was cold, -15°C , and the skis were very sticky, but it made for a great workout.



Fig 3. Skate skiing with Steve Howell.

Knee Sessions

Chondral lesions in young athletes – Bert Mandelbaum



Fig 4. Full thickness chondral lesion.

Athletes get arthritis before they should; Galen wrote about this several thousand years ago. Bert reviewed the chondropenia index. This is a measure of the loss of volume of articular cartilage first reported by Stephan Lohmander. This is a dose response curve that shows that a partial meniscectomy increases the incidence of osteoarthritis by 22 times. If you add obesity, and female gender this is cumulative.

Chondral lesions in athletes will produce osteoarthritis in 50% of patients by 14 years. ACL injury results in a high incidence of osteoarthritis due to the cytokines that are produced with the injury to the articular cartilage. There are several modulators, such as obesity, and estrogen deficiency. There is also a predictable age related loss of articular cartilage. Elite soccer players have more osteoarthritis compared to recreational soccer players. Maybe jogging is the safest activity for your knees!

Articular Cartilage Treatment– when, why, and how. Nic Sgaglione

In chronic ACL deficiency, 10% of patients have cartilage lesions.

Guettler in AJSM 2004 reported that 10 mm is the cut off size, but shoulders and containment are also important. Size matters - 10 mm.

The degradative process with cytokine production is what really affects the joint.

Maletius in AJSM 1996 reported that 50% go on to late osteoarthritis.

Shelbourne published in the JBJS in 2003 the 10 year follow up of 10 mm chondral lesions. He found the outcome was the same whether or not they were treated. The weakness of this study was the short follow-up and the small size of the lesion. If these were taken out longer the incidence of osteoarthritis may be more significant.

At the present time in the US there are 600,000 chondroplasties, 100,000 microfractures, and 1,000 chondrocyte transplantations.



Fig 5. Microfracture of full thickness chondral lesions.

Knutsen in JBJS 2004 published the randomized clinical trial of the comparison of autogenous chondrocyte implantation versus microfracture, which showed the outcomes and histology were the same at 2 years. This has been continued on and is the same at 5 years. The 78% survival ship was identical in both groups.

MRI imaging will be the future to evaluate the treatment of chondral lesions. One should also look at the body mass index as part of the profiling of patients for treatment. Overweight patients need to lose weight to protect their articular cartilage, and especially before any specialized cartilage treatment regimes. The future is using scaffolds to fill the defects.

Next generation of articular cartilage treatment – Bert Mandelbaum.

The young patient with osteochondritis dissecans treated with chondrocyte implantation has good results, according to the follow-up Genzyme database. Which athlete does well with ACI? The young competitive soccer player does well, as do those with a shorter period of symptoms.

The conclusion that Mandelbaum draws from the Knutsen study is that ACI **ALSO** does well. It is a first generation treatment, and this will improve with newer second generation arthroscopic procedures such as Hyalograft. The adverse events seen with the Genzyme procedure have been significantly reduced. MACI is a collagen scaffold that has been acquired by Genzyme. The OBI multilayered product has promise, and needs a registry trial. The repaired cartilage at the edges is good. The OBI implant should have chondrocytes added to the surface layer.

The next, or 3rd generation, is to improve the chondrocytes. TiGenix.

CAIS scaffold by Mitek Dupuy is a one step replacement.

Verdonk and Ochi have new sophisticated techniques to replace the chondral defects. Watch for further studies by Ochi.

RF chondroplasty – Nic Sgaglione

There is still a lot of radiofrequency chondroplasty going on. Market research showed that 52% of arthroscopic surgeons are using the heat probe in the community. There are limited clinical comparison studies.

The ICRS Grade system is user friendly, for instance Grade 3D is delamination, and this is not present in the Outerbridge classification. It is important to realize that both shavers and heat probes can cause damage. Access to the patella is better with the RF probe than with the shaver. The injury to the cartilage is measured by histochemical assessment. Red is dead.

Lu in AJSM 2002 showed that the injury is time and temperature dependant.

Charring and carmelization is bad. You should be etching versus charring.

Owens and Busconi 2002 showed improvement with RF. Pettrone showed safety of RF treatment with multi-center trial.

The summary is that grade 2 to 3A ICRS grading system lesions can be treated with RF.

So you thought that arthroscopy was safe. Jack Bert

Small's study on complications was the last major complication study.

DVT rate is 18%, and pulmonary embolism rate is 1.3%. The problem is that most of the pulmonary emboli come from silent clots in the leg. We end up treating the most benign of the lesions, but 25% of calf DVT will migrate.

37% of patients had at least one risk factor. This is a group where we should use prophylaxis, but there is no routine protocol for prevention.

Bert gives all patients 325 mgm of ASA one week before, and 3 weeks post-op.

If risk factors are present the patients get 2.5 mgm coumadin 48 hours pre-op and for 3 weeks post-op.

Wrong site surgery still has a 1.7% incidence. There is no excuse for this complication. There is more chance with increasing age of the surgeon, and increasing case loads of surgeons.

For a routine arthroscopy the infection rate is 0.8%. That incidence is increased with post-op steroid injection. No reduction in the infection rate is seen with the use of pre-op antibiotics. (Bert AANA 2005)

Nerve and vascular injury is 1.8%, and is increased with meniscal repair

Chondral injury is very common, especially in a tight knee with meniscal repair.

This may be an indication to use a heat probe to treat the lesions. (better access with smaller probe)

In cases of significant fluid extravasation, stop the case. The fluid will reabsorb, and generally does not need fasciotomies.

Cryo-cuff cold burn injuries of the skin still occur. They are more likely with the continuous pump devices.

Allograft infections are still a worry, and this is one more factor that the surgeon has no control over. The recent problem of harvesting body parts without proper screening emphasizes this variability once again.

Complications of meniscal fixators have been described, but mostly they are chondral injuries. There have been no published cases of FastFix causing vascular injury.

Meniscal Repair Devices – Nic Sgaglione

Nic reviewed the current meniscal repair devices

Fast fix device has the same pullout as vertical mattress suture. (Barber Arthroscopy) Zantor in AJSM 05 showed good cyclic load. Kotsovolos reported good clinical results with Fastfix in Arthroscopy 2006.

Vertical sutures should be placed over and under the meniscus.

The fast fix can be placed transversely under the meniscus.

Platelet rich plasma improves the healing in isolated repairs

Meniscal suturing – Patrick Greis

Greis feels that the inside out suture repair with 2-0 fiberwire is now the gold standard. Meniscal repair devices do not have long term outcomes published, and sometimes you can't use them. Recent studies have shown deterioration of the results of rigid fixators with longer follow-up. The cost of fixators is also significant. Sutures are safe, quick, easy, and cost effective,

Meniscal Transplantation Nic Sgaglione

500-700 per year are done in USA. The meniscal transplant alleviates pain, and improves function in 89% of patients. It is still a salvage procedure, for light sports. Noyes and Verdonk have published over past year that the 10 year follow up shows 70% survivorship. But, you need to know your tissue bank. Is the bank a member of the American association of tissue banks? This may help avoid the HIV transmission. There is no literature to support the concept that the meniscus allograft is chondroprotective. See Rijk in Arthroscopy 2004 and Kelly at AAOS 2005. These studies support doing the transplant earlier rather than later in the young asymptomatic patient. Use bone scans to follow the patient. When the scan becomes hot, think meniscal transplant.

The indications for a meniscal transplant are focal pain in young symptomatic patient with normal axial alignment.

Use sutures for fixation. Use a slot technique on lateral side and on the medial side use the bone blocks. Farr and Cole have been doing a bridge and slot on medial side. The meniscus will usually heal well.

Role of Synthetic Meniscal Transplant. Scott Rodeo

The synthetic degradable polyurethane scaffold has been reported in the AJSM 2006. Bruce Reider has written an editorial in the AJSM about this topic.

Hydrogels (same material as contact lens) can be used for meniscal replacement. In the sheep most of the implants tend to break down.

CMI, which is bovine derived tissue for segmented replacement, was developed by Steadman and Rodkey. This has been released for clinical use in Europe.

There are no reactions, and the implants are safe. Biopsies, show meniscal like tissue, and second look were done on the clinical trials. The Tegner scores are

improved. Small Intestine Submucosa is another scaffold to support ingrowth. This was reported by Cook AJSM 2006. The future may belong to mesenchymal stem cells

Lateral release – Ned Amendola

Liew reported in the AJSM in 1995 about recurrent medial dislocation after extensive lateral release. The treatment was to repair the release defect. Lateral release is for tilt only. Don't use a tourniquet, and obtain hemostasis. Avoid too proximal a release. Make sure the release is completed down to the anterolateral portal. Use the shaver to remove the fat and synovium to visualize the distal release.

When to do a Medial patellofemoral reconstruction? – Patrick Greis.

When the anatomy is normal a soft tissue proximal procedure, lateral release and medial plication may be done, but when trochlear dysplasia is the main factor, the treatment varies:

Trochleoplasty in France

Distal realignment in US

Another view is to repair deficient medial soft tissues.

Greis does a distal realignment with lateral release and no medial reefing. There were 4 failures in their series of 45 patients. 10% The conclusion was that if the patient fails, then a medial patellofemoral ligament reconstruction should be done. This may take a prospective randomized clinical trial to study this question. The indication for MPFL reconstruction is a failed distal realignment, or deficient medial structures with trochlea deficiency (look for crossing sign on the lateral x-ray view, and the bump superiorly)

Greis uses the semi-t with a small vertical incision. He uses 2 small tunnels that come out half way across the patella. Loop the graft around the patella. The short tunnels avoid the complication of fracture.

Make a socket on the epicondyle for the graft. Pass the graft deep, but above the synovium. Pull the graft into the femur with a beath pin and use a bioscrew fixation at 30* of knee flexion. Be careful about too much tension (2-10 N of tension). He has a small series done as revision for failed distal realignment.

Nerve Blocks

An anesthetist presented an interesting procedure that uses ultra-sound localization of the femoral nerve. He avoids touching the nerve with the nerve stimulator, and places the local nearby. This is quick, effective, and easy to do. The nerve lies below the fascia iliaca. I don't think that this will catch on. How many anesthetist's will buy, and learn how to use an expensive ultrasound machine when the femoral nerve block is one of the safest procedure to perform. We have done thousands at our center with no significant complications, even though they were done with a wide range of expertise.

Septic Arthritis post ACL reconstruction Septic Arthritis Post Arthroscopy

Bob Jackson[1] was one of the first to suggest that septic arthritis should be managed by arthroscopic irrigation and debridement.

According to Williams et al[2] management of post op septic arthritis after arthroscopy should be by arthroscopy lavage, debridement, synovectomy, and IV antibiotics.

The indications[3] for arthroscopic intervention depends upon the clinical findings, the increased ESR or CRP, an increase in leukocyte count in the joint fluid and no bone involvement on x-ray.

The issue of repeating the scope was addressed in a review of septic arthritis after ACL reconstruction. McAllister[4] reported that there was an average of 2.75 arthroscopies performed to control the infection. In his series of 4 patients the graft was preserved. In another study the graft was removed in

The duration of the antibiotics should be at least 4-6 weeks[2], followed by oral for another 4-6 weeks. Armstrong [5] suggested that 2 weeks of antibiotics was sufficient.

The question of whether the joint should be treated by arthroscopic or open arthrotomy was addressed by Wirtz et al[6] In their study comparing the two treatment regimes the arthroscopic method led to improved outcomes.

It is also noted that if an incision is made for meniscal repair, this may be the source of extra-articular infection and must be debrided at the time of arthroscopy of the joint[2]. In another study by Stutz[7] the combination of arthroscopy and IV antibiotics cured 91% of the cases. Open surgery was necessary in 4%.

It is generally impossible to predict who will incur a post op septic arthritis[8]. Risks factors were studied by Armstrong et al[5] and found to include steroid injection at the end of the procedure, prolonged surgery time, increased numbers of procedures during surgery, prior procedures, and performance of chondroplasty or soft tissue debridement. Armstrong [9]also reported that one of the major factors was the injection of the joint at the end of the arthroscopy with steroids.

The use of drains and suction irrigation was popular in the past[1, 10], but recently has fallen out of favour. Repeat arthroscopy for persistent symptoms seems to be the current preferred method of treatment.

Should preventive antibiotics be used in all arthroscopy cases? A cost benefit analysis was done by D'Angelo et al[8] Bert presented a study at AANA in 2005, that showed antibiotics were not beneficial in routine arthroscopy.

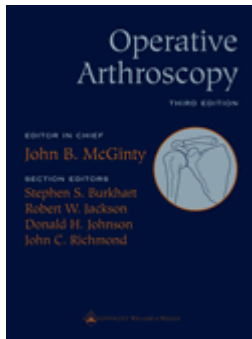
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Tips for Harvesting the Hamstring Grafts to avoid complications.

- Make sure that the incision is in the right position to easily access the tendons. The landmarks are found with the knee in the figure 4 position. The incision should be oblique running from 2 cm medial to the tibial tubercle, and 5 cm below the joint line (3 finger breaths) and directly along the course of the tendons.
- After the skin incision is made, and the fat is stripped off the fascia, palpate the tendons, and incise the fascia on the superior surface.
- Use the tip of the scissors to fall into the pes bursa. This ensures that you are in the correct plane, and will not dissect under the medial collateral ligament.
- Use the scissors or knife to remove the tendon attachment to the tibia. Turn this flap over to visualize the 2 tendons. Split the conjoined tendon distally.
- Now pull the tendon into the wound to show the bands that attach to the gastrocnemius. It is preferable to pull the tendons into the wound to avoid pushing the scissors proximally and injuring the saphenous nerve.
- After the bands have been divided and there is no dimpling of the skin when the tendon is tugged, you can proceed to use the stripper to remove 22-25 cm of tendon.

McGinty's Operative Arthroscopy Textbook (now available in Spanish)



Extensively revised and updated for its Third Edition, **Operative Arthroscopy** remains the most comprehensive and authoritative reference in this rapidly advancing specialty. World-renowned experts describe the latest instrumentation and techniques and detail proven minimally invasive procedures for the knee, shoulder, elbow, wrist, hip, foot, ankle, and spine.

This edition gives experienced and training orthopaedic surgeons the state-of-the-art information they need to stay current and increase the coverage in their practice. New topics include meniscus repair with implantable devices, arthroscopic knot tying, post-traumatic and post-surgical shoulder stiffness, the thrower's shoulder, thermal capsulorrhaphy, fractures about the shoulder, arthroscopic radial head resection, arthroscopic management of the stiff elbow, elbow arthroscopy in the throwing athlete, hip arthroscopy in the athlete, arthroscopic-assisted management of ankle fractures, osteochondral autografts of the talus, and sub-talar arthroscopy.

Hundreds of quality illustrations--including full-color arthroscopic views, surgical exposures, and line drawings--guide surgeons in technique and clinical decision-making. The text offers stepwise intra-operative instruction on commonly performed procedures, including cruciate ligament reconstruction, meniscal

repair, stabilization of the shoulder, treatment of rotator cuff tears, and meniscal and chondral allografts.

This edition includes a free DVD of surgical procedures, with over 200 minutes of select authors' video to demonstrate key surgical points and techniques.

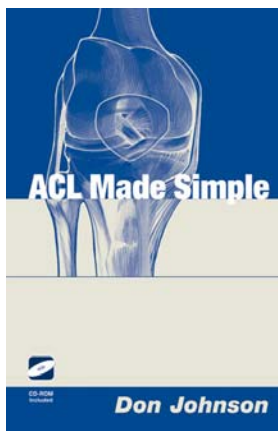
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ACL Made Simple

All you wanted to know about the ACL is now available in this book and CD from Springer. See the web site at:

<http://www.springer-ny.com/detail.tpl?cart=10722687896533522&isbn=0387401466>



ACL Made Simple is a book/CD-ROM combination that educates orthopedic residents, athletic trainers, and various medical support staff about the fundamentals of ACL injuries. The content is both thorough and practical. Readers benefit from comprehensive discussions of diagnosis, partial tears, treatment options, operative techniques, and complications. This definitive guide also outlines a six-month rehabilitation program complete with goals, stages, and exercises. More than 150 photographs and diagrams illuminate key concepts.

The CD-ROM is keyed to each chapter and compliments the text, making it easy for users to locate sections of particular interest. The numerous graphics and narrated video clips are dynamic tools that highlight topics including the mechanism of injury, physical examination, and surgical techniques.

Table of Contents

Contents: Introduction, Diagnosis, Partial Tears of the ACL, Treatment Options, Graft Selection, Hamstring Graft Reconstruction Techniques, Patellar Tendon Graft Technique, Rehabilitation, Complications, Results, references

Upcoming Meetings

- **AAOS Annual Meeting – 22-26 March, 2006 Chicago**
Contact www.aaos.org
- **Residents and Fellows Arthroscopy Conference 5-6 May 2006**
 - Palm Island Florida
 - Contact ksousa@linvatec.com
- **AANA Spring Annual Meeting** Hollywood Florida May 17-21, 2006
contact www.aana.org
- **Esch Shoulder Meeting San Diego CA** June 21-24, 2006
 - Contact www.shoulder.com