

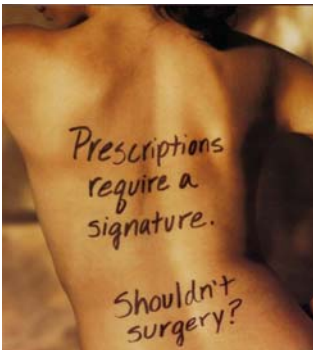
May 2005 Newsletter

Editorial



Sign your site

The academy has a new push to sign the operative site before the operation with the patient awake, and verifying the site. This initially started about 10 years ago, and they have now produced a DVD of public service announcements including the sign your site message. With a patient driven program, maybe the few remaining laggards will be brought on board.



It is amazing that I still hear that some folks are not doing this simple procedure to verify the operative site. Operating on the wrong site still occurs and is a payout in 80% of the cases. Get with the program, and sign your operative site.

AANA summary

AANA Annual Meeting Vancouver – Dr. Aaron Campbell

The AANA annual meeting was held in Vancouver May 12-15 and marked the culmination of Dr. Don Johnson's year as president of AANA. An impressive contingent of D.J.'s fellows who have had the pleasure of learning from a truly excellent teacher and clinician were on hand to show their appreciation for all Dr. Johnson has contributed over the years. Both the Harbour cruise and President's dinner provided memorable opportunities to say thank-you to a special mentor.

The scientific presentations once again demonstrated AANA's role in promoting new and innovative approaches to problems in surgery. Many studies on a wide variety of topics relating to knee surgery were presented. Many were case series with limited numbers and thus would not change one's practice, but there certainly was lots of "food for thought". However, a few papers stood out in the opinion of the writer.

Dr. Monika Volsek's paper comparing the use of the XtraLok and Intrafix tibial fixation devices was recognized as the Best Fellow Paper. As an RTC, this paper definitely stood out and demonstrated significantly less mechanical laxity in the XtraLok group at six months post op. Congratulations to Monika and we look forward to seeing the results at one year.

Dr. Michael Bradley's study on the use of Zolpidem (Ambien), a common sleep aid, discussed a new approach to post ACL reconstruction fatigue. This study demonstrated an interesting relationship between the administration of Zolpidem and decreased post op pain. Based on these findings the use of sleep aids to diminish post op morbidity is certainly an area for future research.

The need for antibiotics in a straightforward arthroscopy was reviewed by Dr. Bert. It was interesting to see the results of his impromptu poll of the audience, which revealed a prevalent use of antibiotics, especially amongst American

surgeons. The results of the study were consistent with the literature and recommended against the use of antibiotics for routine arthroscopy.

Dr. Bradley Thomas presented sound work looking at the tibial footprint in ACL intact knees undergoing TKA. Predictably there was considerable inconsistency in the sizes of the resected plateaus. This size difference also resulted in variability in the distance between the ACL and PCL. The anterior horn of the lateral meniscus was found to be the accurate landmark of the ACL midpoint, something to consider for those using a PCL referencing guide.

The double bundle ACL received a significant amount of attention. Dr. Georgoulis presented a motion analysis study which showed that tibial rotation was not restored to normal with either a BTB or STG ACL reconstruction despite having restored normal anterior posterior laxity. Likewise, Dr. Denny Lie presented evidence from a cadaver study which showed improved control of tibial rotation with a double bundle technique versus a single bundle technique. Despite this evidence in favour of the double bundle technique, the persistence of a pivot shift in 20% of patients at 18 months follow-up seen in the study of Double Bundle ACLs by Dr. Patrick Dijian, is of definite concern. The issue of a single versus double bundle will be a subject of debate for some time.

Finally, the PCL papers had a definite international flavor, with papers from Korea, Taiwan, Germany, and France. Studies looking at allograft and autograft as well as single and double bundle techniques were presented. Although in general, the studies showed improved stability and symptoms, there failed to be a real consensus on superior techniques or graft types.

Current Status of Knee Ligament Surgery

Anterior Cruciate Ligament

Introduction

The torn ACL is a common athletic injury in today's sports. In the past this was a career ending injury, and now it is a 45 minute outpatient operation with a 90% successful outcome. What have we learned about the ACL injury? There is a perception that the ACL information is mature and most people feel that they can do an ACL reconstruction without much difficulty.

However, most published studies show that only 70% have a KT-1000 measurement of 0-2mm side to side difference. Clearly, we have not been able to return everyone to the same sport and same level of participation. There is still room for improvement.

These are some controversies that remain:

- Indications
- Graft choice
- Techniques – transtibial tunnel or anteromedial portal to drill the femoral tunnel
- Double bundle ACL reconstruction
- Soft tissue graft fixation
- Pain control
- Rehabilitation
- New concepts
 - Computer assisted navigation

Indications

The indications for ACL reconstruction remain much the same. The young competitive pivotal athlete in soccer or basketball generally needs an ACL reconstruction to return to sport. There are always exceptions to this statement, but the risk of re-injury is high enough to recommend surgery to this group of patients. The middle aged weekend warrior who tears his ACL (and has no meniscal injury) has a choice of conservative treatment with activity modification, and the use of a brace. If this regime fails then ACL reconstruction can be considered.

Graft Choice

The choice of the graft is immaterial. The meta-analysis by Yunes and Back both showed better stability, but more anterior knee pain with the patellar tendon graft. There was more laxity with hamstrings, but less harvest site morbidity. Cohen presented at ISAKOS in 2003 that at 15 year follow up of BTB reconstructions, 75% had osteoarthritis of the patellofemoral joint. This was due to the inability to regain full knee extension postoperatively. If you are unable to control the post operative program to ensure full extension, it might be wise to choose the hamstring graft, in which there is less loss of knee extension. However, there is weakness in full flexion after harvesting the hamstring graft, and sprint athletes should not undergo a hamstring reconstruction. In light of the reduced morbidity of the hamstring graft, it is ideal for the over 40 active patients. However, everything that is said in favor of the hamstring could also be said for the allograft. There is obviously no harvest site morbidity, but the risk of transmission of disease or infection with the graft is a factor over which you have no control.

Techniques for tunnel placement

The most important factor in obtaining a successful outcome of ACL reconstruction is to place the tunnels in the correct position. The most common cause of failure is the anterior placement of the femoral tunnel. The single incision technique of ACL reconstruction is the most popular. The transtibial approach to creating the femoral tunnel may place the graft in a too vertical position. In a study by Choa the medial portal approach to drilling the femoral tunnel placed the graft at an angle that more closely resembled the normal ACL. If you do use the transtibial technique you must start the drilling next to the MCL to create an angle of the tibial tunnel of 65-70* (as pointed out by Steve Howell) With this angle you can drill the femoral tunnel at the 10 or 2 o'clock position. This low position on the femoral condyle puts the ACL graft at the same oblique angle as the normal ACL. When you are doing your next routine diagnostic arthroscopy, look carefully at the attachment site of the ACL on the femur. The posterolateral bundle is very low and distal.

Double bundle ACL reconstruction

The double bundle ACL reconstruction has suddenly become the hot topic of the year! There are several surgeons around the world who have had considerable experience over the years with the double bundle ACL reconstruction. Tom Rosenberg has been doing a single tibial tunnel with a double femoral tunnel and endobutton fixation for at least 10 years. Freddie Fu has now done about a hundred cases (with a current operating time of 1 hour) with 2 tibial and 2 femoral tunnels. Fu is very enthusiastic about the double bundle, and of course, after watching his presentation, I almost became a believer. Yasudo from Japan is comparing the conventional single tibia, single femoral procedure, with the single tibia, double femoral, and the double tibia, double femoral tunnel techniques. This study was presented at the ACL study group. The mechanical stability was significantly improved with the anatomic procedure (double tibia and femur)

Others who have had experience are Christel, and Bellier from Paris France, Aglietti from Florence Italy, Marcacci and Gobbi from Italy, Eichhorn from Germany, Shino, Kurasaka, Muneta, and Yasuda, all from Japan.

First of all, what is the rationale for the 2 bundle reconstruction? As Freddie Fu says "Repair what is torn". There are 2 bundles that have been torn; therefore, you should repair both bundles!

The other issue that we have is that most published reports of results of ACL reconstruction quote satisfactory KT results, but only 70% have 2 mm or less manual maximum side to side difference. The rotational control is not complete, especially at 30 degrees of knee flexion. At the present time, this is not measurable by the KT-1000 device. We also know that some athletes are unable to go back to their same level of activities. We have occasionally blamed this on psycho-social factors (Gobbi). That may be true, but it may also be that the knee doesn't feel right, and they lack the confidence to return to a high level of pivotal sport, due to the rotational instability.

The current consensus is that the double bundle reconstruction is more difficult, and probably an unnecessary technique, with minimal improvement in the current outcome measurements. There are some cases in which it is very

difficult to obtain good stability. This procedure does increase the risk of technical failure; there are twice as many chances to put the tunnels in the wrong position! Double tunnel, double trouble! This is not an easy technical procedure as evidenced by Muneta, who is now on his 4th version of the procedure. Most ACL reconstructions are done by the occasional ACL surgeon, and incorrect tunnel placement is still the most common cause of failure. In this procedure, tunnel placement is more difficult as there are no satisfactory guides to assist in wire placement. With the increase in bulk in the notch there is more opportunity for impingement of the graft and lack of extension.

I think that I am coming around to accepting it, but I think that most of us should wait until the technique is perfected, and most important, wait until someone (like Freddie Fu) has figured out the indication for this procedure.

Soft tissue graft Fixation

The fixation of the soft tissue graft (4 bundle hamstring graft) has improved significantly over the past few years. Howell was an early proponent of the rigid fixation of the 4 bundle hamstring graft and published excellent results with the use of early aggressive rehab. Now, the hamstring graft is 90% of our reconstructions. In the NFL, the team physicians use the patellar tendon in 99% of the cases. In the ACL study group 80% use the patellar tendon. Why the difference? The improvement in the fixation of the 4 bundle hamstring graft has allowed early rehab and stability results similar to the patellar tendon without the problems of anterior knee pain and lack of full extension. Kousa in AJSM in 2003 presented a biomechanical comparison of the currently available fixation devices for both the femur and the tibia. The best result on the femur was with the cross pin and the closed loop endobutton. The interference screw is bone quality dependent. We have completed a RCT (e-poster AANA 2004) comparing the endobutton and the interference screw backed up with the EndoPearl. There was no difference in functional outcome or mechanical stability measured by the KT-1000. On the tibial side, the intra-fix and the washer lock screw had the best mechanical properties. We have just completed a RCT of the cortical cancellous

screw (XtraLok) compared to the IntraFix and in the early 6 months follow-up, the XtraLok has better mechanical stability.

Pain Control after ACL reconstruction

Pain control after ACL reconstruction has been one of the most significant advances over the past few years. We are now using pre-emptive multi-modal pain control consisting of oral non-steroidal medication, femoral nerve block, intra-articular and incisional injections. Post operatively cryotherapy and continuous passive motion (more for the elevation effect) are also used. NSAID are only used for 5 days together with analgesics.

Rehabilitation

The rehab for both hamstrings and patellar tendon grafts may be accelerated for the routine ACL reconstruction. In the early phase, the only exercise to avoid is active hamstring resisted strengthening. It is important to regain full extension early in the program.

Computer assisted navigation for ACL reconstruction

Dr. Jurgen Eichhorn from Strobinger, Germany has done over 300 cases of double bundle ACL reconstruction using the Orthopilot navigation system. Initially the reference wires are placed into the tibia and femur. The position of the knee is determined by the infrared sensors, and displayed on the monitor. He uses a probe with infrared sensors to reference the correct position of the tibial and femoral tunnels. After the position of the tunnels is determined, he can see on the monitor and check for any superior or lateral impingement, and calculate the a-p displacement. The tunnels are then drilled in the usual fashion.

The consensus is that for the experienced surgeon, there is no need for an image guided system. One of Eichhorn's studies was conducted with inexperienced residents, and they were able to place the tunnels in the correct position in most cases. This may have some application for the occasional ACL surgeon, or for complex cases, such as double bundle ACL/PCL reconstruction, or for tibial osteotomies combined with ligament reconstruction.

Posterior Cruciate Ligament

The outcome of PCL reconstruction has been somewhat inconsistent, and this may be due to a number of factors.

- Anatomy – the PCL is a complex double bundle ligament
- Biomechanics – there is continuous posterior force of gravity on the graft

There are a several controversial issues related to solving the problems:

- Technique of transtibial tunnel versus the posterior inlay
- Single femoral tunnel versus the double femoral tunnel
- Graft choice of autogenous versus allograft

The posterior inlay as described by Berg in 1995 screws a bone block to the posterior aspect of the tibia. This reduces the killer tunnel angle around the back of the tibia. Bergfeld has shown that with cyclic loading, the transtibial graft is thinned and attenuated around the tibia leading to graft failure. Markoff has shown that if the bone block of the graft is put in the proximal end of the tibial tunnel, the angle is eliminated. Cooper has presented, and published satisfactory results of the single bundle posterior inlay graft . Fanelli, Noyes, and Chen all have published good results with transtibial single bundle reconstructions. The latest twist is the posterior inlay graft with 2 femoral bundles. Stannard has published a series of good results using this technique. There is published biomechanical confirmation of the double bundle by Harner and Noyes to favour this technique of PCL reconstruction. The innovation of Ohkoski to drill the tibial tunnel from the lateral side and using autogenous hamstring tendons has given the author good results. BeBerardino has used the split stacked Achilles tendon allograft to increase the size of the graft and have a split tailed graft to create 2 femoral tunnels. Richards, Noyes, and Chen have published results using the quads tendon, which is very similar in appearance to the Achilles allograft. Post-operatively, the rehab is much slower after PCL reconstruction. The patient is braced in extension, with a pad under the calf to push the tibia forward. Only prone lying range of motion exercises are allowed for the first few weeks.

Posterolateral corner

The posterolateral corner is frequently overlooked, but must be reconstructed at the time of PCL reconstruction to ensure a satisfactory outcome. It is preferable to repair or reconstruct the posterolateral corner acutely, as the results of late reconstruction are not as predictable. Stannard has used a hinged external fixator post-op with good results after the early repair of the multiple ligament reconstructed knee. LaPrade has recently published an anatomic reconstruction of the posterolateral corner. A follow-up series with excellent results was presented by Englebretsen and LaPrade at ISAKOS this year.

Medial Collateral Ligament

Isolated MCL injuries are usually treated conservatively. Complete injuries, grade 3, are usually associated with injuries to the ACL or PCL. Most combination ACL – MCL injuries that occur in skiing can be treated by immobilization to protect the MCL while healing. The ACL can be reconstructed later. (Shelbourne) Complete injuries to the MCL are rare and are diagnosed by an anteromedial rotational instability. Open MCL repair is recommended in this situation. (Sims AJSM 2004)

Bibliography available on request.

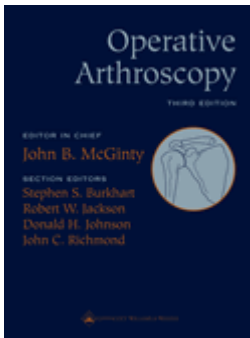
Palm Island Residents and Fellows Arthroscopy Conference.

April 22-24 marked the Palm Island Residents and Fellows meeting in Florida. This year marked a change in location to Palm Island. The facilities of the island proved ideal to promote the informal and relaxed atmosphere that has become an integral part of the meeting. Sponsored by Linvatec, this conference provided an excellent opportunity for young orthopods to both present research and be educated by accomplished orthopedic surgeons. The relaxed environment and small size of the meeting allowed those new to presenting to gain confidence and benefit from helpful tips offered by more senior colleagues and encourages questions during the teaching sessions without the intimidation of a large audience.

All who attended were treated superbly by Linvatec with plenty of great food and entertainment including a trip to see the World Champion Red Sox play the Devil Rays at Tropicana Field. Thank you Linvatec. Congratulations to Dr. Jerome Desilva from the University of Western Ontario who received the best paper award for his work on ACL reconstruction and combined high tibial osteotomy. Also thanks to Dr. Laurie Heimstra, Dr. Nicholas Scaglione, Dr. David Bergerione, Dr. Don Buford, and of course DJ, for all their instruction and constructive comments.

In the end, much was learned and much fun had by all. New friendships were made and some old ones renewed. I strongly encourage any fellows or residents to attend next year.

McGinty's Operative Arthroscopy Textbook



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.

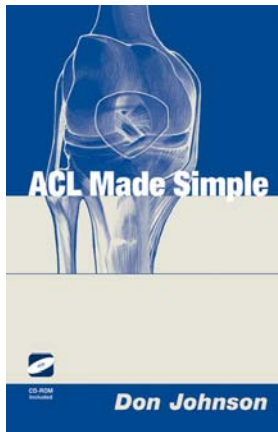
See full description at:

<http://www.lww.com/product/?0-7817-3265-4>

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

- **San Diego Shoulder Course** - June 22-25, 2005
Contact www.shoulder.com

- **Masters Knee Course at the Learning Center Chicago.** 5-7 Aug, 2005
 - This will be hands-on cadaver teaching course featuring Double bundle ACL reconstruction with Freddie Fu, meniscal transplantation with Walter Shelton, computer assisted techniques with Jason Koh, and meniscal repair with ACL reconstruction by Don Johnson.
 - Contact AANA at www.aana.org Masters Experience
- **AAOSM Annual meeting** - July 14 – 17, 2225 Keystone Colorado
Contact www.aossm.org
- **AANA Fall Course** Dec 1-4, 2005 JW Marriott Desert Ridge Resort & Spa.
Phoenix, Arizona. Contact AANA www.aana.org