PRACTICAL ARTHROSCOPY

Practical & Timely Information on Arthroscopy and Sports Medicine

NEWSLETTER

Editorial - The Surgeons Blog

Since I have stopped publishing the Practical Arthroscopy Newsletter, I have had a gap in my writing and communication, and actually missed it. I thought that the new look may be to publish a blog every month on a wide variety of issues related to Arthroscopy and Sports Medicine. So here is the first attempt. It sort of grew out of the Surgeons snippets corner from the newsletter, and I will try this look out for the next few months.

Creating the femoral tunnel through the anteromedial portal.

I think that it is my mission to convert all the transtibial tunnel users to the anteromedial portal, or soon to a new technique of outside in drilling.

In many cases it is simply not possible to get to the correct position on the femur without going very medial, shallow on the external surface of the tibia and more posterior on the ACL footprint on the tibia. I have been looking back on my tibial tunnels and found that I had been gradually cheating them more posterior, almost to the PL bundle position on the tibia. I will have lots more to say about this in the future.

The advantages of the AM portal – Harner Arthroscopy Jan 2008

- Accurate femoral tunnel placement independent of the tibial tunnel placement
- Affords easy preservation of intact ACL bundles, either the AM or PL bundle augmentation cases.
- Flexibility in performing either single or double bundle reconstructions in primary or revision situations.
- Flexibility with any graft fixation device.
- Allows parallel placement of interference screw fixation through same medial portal as that used for tunnel creation
- Decreased tunnel widening

References:

Arnold et al Knee Surgery, Sports Traumatology, Arthroscopy 2001

Heming et al. AJSM 2007

Harner et al, Arthroscopy 2008.

Age Limit for Microfracture.

Dick Steadman has pushed the age limit for microfracture above 50 years of age. He has published results of patients with degenerative knee of average age 5o with good results. (Journal of Knee Surgery 2004) The cohort improved function at 2 year follow-up. It happens to all of us. As we age the upper limit for surgery moves with us!

An article by Sudkamp et al in Arthroscopy in 2006 showed that the results are age dependent, and significantly deteriorate after age 40. In their study of 85 patients who underwent microfracture of the medial femoral condyle for gd 4 lesions the patients were stratified to less than 40 or over 40 years of age. The deterioration begins at 18 months after surgery and is significantly pronounced over 40 years of age.

Is this a situation where injection of PRP might benefit the end result?

This could be the focus of a study. To randomize the microfracture patients to PRP or no PRP after the microfracture. Why not add another arm, HA injection.

Rehab for microfracture.

One of the contentious issues with microfracture is the very conservative rehab that Steadman advocates. Steadman has always maintained that if you don't follow his surgical technique and rehab you will not be able to duplicate his results. He maintains that you must use CPM and be non-weight bearing for 6- 8 weeks, and to use oral glucosamine.

The practical problem that we all face is that often the patient is consented for a menisectomy and at the time of surgery a full thickness cartilage defect is found. The patient expects to return to work and sports in a couple of weeks and is told he needs to be NWB and to use CPM for 6-8 weeks. This is a major inconvenience and the compliance if probably fairly low. The question is, is it really necessary?

In a study by Marder in Arthroscopy in 2005 they compared 2 post op regimes after microfracture of relatively small well contained lesions. In one group the 6 weeks of NWB and CPM was followed and in the other an unrestricted weight bearing active rehab program was followed.

HA injections post microfracture

This study from Stauss in New York evaluated the effect of post microfracture injections of HA in rabbits. They found the quality of the repair tissue as evaluated histological was improved at both the 3 and 6 month time.

A clinical study showed that the functional status as measured by the Tegner scale was improved with HA injections post debridement in osteoarthritis patients. The IKDC outcome measurements were not improved. The authors recommended HA post debridement in the active athletic population.

Age Limit for ACI

Tom Minas has recently presented a study to show that except for compensation patients, the results of ACI in patients over 40 years of age are the same as for young patients. His recommendation is that for athletic patients over 40 ACI is a good option.

Of interest to note that in this 2 stage open procedure he had a 40% re-operation rate for overgrowth of the graft or for lysis of adhesions in a stiff knee. The open procedure still has significant morbidity, which should be reduced with the new generation of arthroscopic procedures.

A paper presented by the Genzyme study group showed that 93% of the original 1-5 results are sustained at the 6-10 year follow-up. 75% of patients at the initial 1-5 year follow-up improved with ACI. Most of the common problems of graft detachment or overgrowth occurred in the first 5 years. The authors concluded that ACI is a durable procedure up to the 10 year follow-up period.

Age Limit for ACL Reconstruction

A survey of the participants at this year's ACL study group revealed that 90% of the members had no age limit for ACL reconstruction (the group is aging!) For the first time since this survey was started 15 years ago hamstring grafts were the most common graft choice, with 48% using hamstrings and 33% using BTB and 11% using allografts. Of course, many of us use all the various grafts, and try to tailor the graft choice to the patient's activity level and demands. I would guess that the increased use of the hamstring and allograft has pushed the age limit upwards.

A paper from Rochester that presented at the AAOS this year reviewed their results in patients over 50 years of age. (remember when it used to be 40 as the upper limit for ACL reconstruction) The mean age was 57 with 2 year follow-up. BTB autograft was

used in 31% and BTB allograft in 69%. 83% had returned to sports with a an average 91 score on the IKDC. In the 35 patients there were 2 graft failures and one stiff knee. The conclusion by the authors was that ACL reconstruction in the patient group over 50 had satisfactory results with a high satisfaction and return to sports.

Staging meniscal repair and ACL reconstruction.

I would only stage the meniscal repair and ACL reconstruction when the patient presents on crutches with a knee locked a 45* due to a displaced bucket handle tear of the meniscus. Many patients are weight bearing with an effusion and lacking a few degrees of extension. If you are using a hamstring graft you will not likely have difficult in regaining extension of the knee.

If you do a BTB on the locked knee you will likely lose extension, or at least the patient will have a very difficult time to regain the extension. Shelbourne has emphasized the importance of regaining extension before the reconstruction. He would do a stage reconstruction on any patient who lacked significant extension (he does a BTB harvested from the opposite side)

At the AAOS this year Steadman presented an interesting statistic that staged reconstructions had a lower failure rate (2%) compared to the concurrent reconstructions that had a 16% failure rate. This goes against our belief that the tunnel drilling releases marrow stem cells that improve the healing rate. Hard to explain, but interesting nevertheless.

Medial repairs also had a higher failure rate compared to lateral repairs.

Graft Contamination

Allografts have been cultured routinely, but the contamination on the back table is about 12%. (Walt Lowe AJSM). His recommendation, and also that of the CDC is not to routinely culture the allografts.

Autografts are also contaminated on the back table, BTB about 10% and HS 13%, since they are exposed for a longer time during preparation.

Chondrotoxicity of Marcaine.

I use local anesthetics liberally pre-emptively. I inject the portals, the incision, and the joint before draping. This gives about 20-30 minutes for the Marcaine to bind to the synovium. When we start the arthroscopy the drug is washed out of the joint sparing the insult to the articular cartilage.

There were 3 studies presented this year at the academy on the in-vitro toxicity of marcaine on the chondrocytes.

1. Ian Lo from Calgary presented a paper on the deleterious effect of local anesthetics on bovine articular cartilage. They showed that lidocaine, bupivicaine, and ropivicaine all were chondrotoxic, and were dose and time dependent. The doses were high, the cartilage was soaked in a 50% solution for 12 hours. This is much higher than we clinically use, but may approach the intra-articular catheter used with a pain pump for post-op pain. This may explain some of the usual cases of post-op chondrolysis seen in the shoulder.
2. In another study the authors (Piper et al) showed that Ropivacaine is less cytotoxic to articular cartilage than Bupivacaine.
3. In yet another study the authors (Yeger-McKeever) showed that even with low doses of Bupivacaine were associated with >99% of cell death in 48 hours of exposure compared to <20% cell death with saline controls The authors recommend caution in the post-op use of Bupivacaine in pain pumps with in-dwelling catheters.

HA injections post debridement of the Knee

Zietz published in Arthroscopy (Apr 2008) the benefits of HA injections after an arthroscopic menisectomy and debridement of the knee. The study involved 15 athletic patients who had gd 3 and 4 changes of the articular cartilage. At 3 months the activity level was improved, but the IKDC and WOMAC were not improved. This is not for pain relief, but to improve function for these active patients in the initial period after surgery.

The next question is whether or not injections of PRP post arthroscopic debridement will improve the function. There is a level one study being conducted in Germany to compare HA, PRP and placebo injections post arthroscopic debridement. This should be an interesting study to watch.

HA injections post microfracture

Is there any evidence that hyaluronic acid injections post microfracture is effective?

This article was published by Krang in Biotechnology in 2008

Microfracture used to treat articular cartilage injuries can facilitate access to stem cells in the bone marrow and stimulate cartilage regeneration. However, the regenerated cartilage is fibrocartilage as opposed to hyaline articular cartilage and is thinner than native cartilage. Following microfracture in rabbit knee cartilage defects, application of hyaluronic acid gel resulted in regeneration of a thicker, more hyaline-like cartilage. The addition of transforming growth factor-beta3, an inducer of chondrogenic differentiation in mesenchymal stem cells, to the treatment with microfracture and hyaluronic acid did not significantly benefit cartilage regeneration.

What a great study to compare the placebo versus HA and PRP post microfracture.

What is the potential benefit of PRP in the sports medicine world?

PRP has been shown to increase the production of HA in the joint, to improve the vascularity by neogenesis.

Meniscal repair.

This is probably the most obvious of all the uses, and can be justified based on published improved results with the use at the time of surgery. Why not continue this for several weeks after?

The first obvious benefit would be post arthroscopic meniscal repair. Fibrin clot has been shown to improve the results of meniscal repair. The clot can be added at the time of surgery, or injected into the knee after the procedure.

Microfracture of full thickness chondral defects.

Another fairly obvious use is after microfracture of full thickness chondral lesions. There is no literature to support this concept, but would make an ideal RCT.

Partial tears of tendon or muscle

Chronic tendinosis

Chronic tendinosis of adductor longus, patellar tendon, Achilles tendon, or lateral epicondylitis.

We are going to use the local injection in cases of failure of the ECSW (Sonocur) therapy. This is an avascular region where the stimulation of vascularity would be of benefit.

Double Bundle Reconstruction of the ACL

I have just reviewed the article by Timo Jarvela published in AJSM Vol 36 No 2 Feb 2008. This was the same paper that he presented at AANA last year.

He compared double bundle fixed with bioscrews, single bundle fixed with bioscrews and single bundle fixed with metal screws. At 2 years there was no significant difference in functional evaluation as measured by the IKDC score. He created his femoral tunnels through the AM portal.

He states that the rotational control was better with the double bundle. But, as I look at the pivot shift exam at 2 years:

DB 18 Normal and 4 nearly normal

SB 16 Normal and 4 nearly normal with 1 abnormal.

This looks like there was one pivot shift positive with the single bundle fixed with bioscrews. In the metal screw group there were 10 nearly normal pivot shift tests.

I think that this is a lot of extra work to drill 4 tunnels, with the potential to put them in the wrong position or have confluence of the tunnels, to eliminate one pivot shift case. The

whole thrust of the article in the conclusion is how much better the DB group is. He hasn't convinced me!

When I went back to review my notes from the spring AANA meeting, there seems to be some discrepancy in the numbers, and presumably these are the same patients.

He reported the Lysholm scores to be the same at 1 year, SB -92 and DB – 89.

He reported that at 1 year only 1 patient in the DB group had a positive pivot shift compared to 36% in the single bundle group. This seems very significant, and should be compared to the published results above. He also stated that he had 4 failures in the SB group at 1 year, but I don't see that in the published group. (there were 30 patients in each group)

The other published randomized article also show a very marginal difference.

Yasuda showed 1 mm improvement in the a-p translation, and fewer pivot shift tests with the DB procedure.

Aglietti showed better rotational control and a-p translation with DB technique.

Yagi also showed improvement with a clinical comparison of the 2 techniques. Both of these studies are published in Clin Orthop Rel Res.