

December 2005 Newsletter



Editorial

This month I have the privilege of having 2 papers submitted by my good friend Alberto Gobbi from Milano Italy. I just love those Zegna suits! I missed a trip to Assisi, Italy this year due to a conflict with a meeting in Chile. The travel schedule has not let up, and even next year looks the same. I am now half way through my 15 minutes of fame, only about 8 minutes left. However, Brian Day tells me that I am now officially a lame duck, as I have passed the half way point of my term as president of AANA. This year looked so far away, and now it is almost over. I guess I have to start working on that infamous presidential address for May. Put the spring AANA meeting in Vancouver on your schedule. I know that it is going to be a great meeting, and some of us are taking the cruise up the inland passage to Alaska after the meeting for a little R and R. Come and join us in Vancouver. Check the AANA web site – www.aana.org

The Fellows take on the AANA Fall Course in Palm Desert

NOTES FROM AANA FALL COURSE 2004 PALM SPRINGS – Dr. Ali Alhoulei

Aaron Campbell and I were at AANA fall meeting this year at Palm Springs CA. What made this meeting special is the fact that our staff and mentor is the current president of AANA. We were privileged to be introduced by him to some of the worlds leading surgeons in the field of arthroscopy.

The meeting was held at the Marriott Desert Springs Resort which is a truly a desert oasis with its man-made beautiful landscapes and golf course.

I felt the meeting over all was excellent. It sharpened my knowledge in different areas of arthroscopy and helped to keep me in touch with some of the latest advances in this field.

The wrist and elbow session was very informative. Wrist arthroscopy has become an established area in the diagnosis and treatment of radio carpal and mid carpal pathology.

Dr Hanker spoke of ARIF (arthroscopic assisted reduction and internal fixation) of distal radius and carpal fractures. I felt this method would be very beneficial in comminuted intra-articular fractures in order to obtain true anatomical reduction and fixation under direct vision. The drawbacks are the added procedure time with the associated complications, increased OR time, and cost.

Dr Osterman's talk was about arthroscopic ganglionectomy for dorsal ganglions arising mainly from scapho-lunate ligament. His current series of 146 patients showed higher satisfaction rate, with a 1% recurrence rate. He emphasized that symptoms related to the ganglion should resolve, but not if it's related to other wrist pathology, and performing a diagnostic arthroscopy may delineate co-existing pathology.

The Elbow session included a presentation about arthroscopic management of lateral epicondylitis by Dr. Mark Safran. He showed that this method is safe, reliable, and allows inspection of the rest of the joint. The patients returned to work early, but failed to show improved results over the traditional open method. An interesting talk was by Dr. Savoie, who presented his series on arthroscopic release for the stiff elbow. His series of over 300 patients showed improved extension from -45 to -5 degrees and flexion of 90 to 135 degrees. He reported his complications of one PIN damage and three failures. He concluded that although good results are possible, there is a potentially high rate of neuro-vascular complications, and therefore should only be carried out by an experienced arthroscopic surgeons.

The foot and ankle lectures were very practical, and improved my lab session tremendously. I believe that the field of foot and ankle arthroscopy is now well established in the treatment of OCD, anterior impingement, post traumatic synovitis, loose body removal, and arthroscopic ankle arthrodesis. Dr. Tasto presented good results with arthroscopic debridement and stabilization of missed syndesmosis injuries. This was an early follow-up, in small prospective study of 11 patients.

Dr. Abelow's talk was about new advances in treatment of cartilage injuries in the ankle with autologous chondrocyte implantation using the Hyalograft and M.A.C.I (membrane /matrix autologous chondrocyte implantation) This treatment is not yet approved by the FDA, and only available in Europe. His short follow-up series of 6 ankles with large full thickness lesion showed 5 out of 6 good to excellent results with "hyaline like" cartilage, and no cases of delamination.

The foot and ankle lab session was fun as we learned diagnostic scoping of multiple joints including ankle, subtalar, and 1st MTPJ under supervision of expert ankle arthroscopists such as Dr. Ferkel, and Dr. Younger. We practiced removal of loose bodies and synovial debridement. We performed arthroscopic ankle arthrodesis with accutracs screws.

The knee session was an excellent overview of current recommended treatment of cartilage and ligament pathology in the knee.

On the topic of patellofemoral malalignment, Dr. Shepsis discussed the indications for proximal vs. distal, or a combined procedure for management of patella instability. What I have learned from his talk is the importance of history and examination, supplemented by radiographic findings. This helps determine the type of procedure with best outcome, basically doing the correct procedure that fits that particular patient pathology.

The importance of pain vs. instability influences the verticality of the AnteroMedialization osteotomy of the tibial tubercle. Studies have shown that

patient with proximal and medial patellar lesions still showed some benefit but significantly less than distal and lateral lesions.

The field of UKA (unicompartment arthroplasty) has seen renaissance over past decade, and continues to show improved results with better implants, and easier revision to TKA. The indication for UKA has been increasing in recent surveys. There are reports of better knee kinematics, approaching the normal knee, as compared to TKA.

The role of osteotomy in management of arthritic knee in the relatively older age group, with a sedentary lifestyle, came into question. UKA showed consistently better results over follow up periods of 10 and 15 yrs. HTO remains the preferred procedure in younger patients with instability, and mild to moderate arthrosis who wish to maintain active lifestyle.

Open wedge osteotomy has become the procedure favored by many surgeons, as it is technically easier to perform, with lower rate of complications, and ability to adjust the degree of correction intra-operatively.

Update on the treatment of focal articular cartilage lesions was presented by a top faculty in this field. Dr. Sgaglione presented his argument for marrow stimulation using the microfracture technique. This was complemented by recent prospective studies by Steadman, Williams and Knutsen showing improved results with average follow-up 2-7 yrs. His recommendation for this technique is based on the fact that it's an easy, reproducible, arthroscopic method with good results, low morbidity, and is inexpensive.

Dr. Morgan's argument in support of OATS (Osteochondral Transfer System), was simply that microfracture methods will not restore the composite, and height of native articular cartilage. He quoted studies showing excellent outcome with minimal donor site morbidity. The draw back of this method is the steep arthroscopic learning curve. He recommended doing an mini-open procedure in the beginning of the learning curve. Dr. Morgan stated that an "ideal lesion would be focal, well circumscribed, full thickness, traumatic lesion, in the weight bearing area of femoral condyle, less than 2 cm in size, in an otherwise normal knee"

Dr. Gillogly presented a talk about ACI (autogenous chondrocyte implantation) which was mainly overview of indications,

Techniques, complications and challenges. In his opinion, ACI represents an excellent treatment, with reproducible results, for large chondral defects with production of hyaline like cartilage that has been shown to be durable. The disadvantages are two staged procedure, (biopsy and implantation) and the cost.

Dr. Carter presented an update on the osteochondral allograft. His conclusions were that this method is an excellent option for treating larger defects, over 2 cm in size. It has a long term success borne out by the studies from the University of Toronto, and UCSD in California. It's not limited by size or configuration of the lesion, and has no associated donor site morbidity. Disadvantages of the allograft are the possibly of disease transmission, the availability, and expense.

How do you manage the full thickness lesion of the femoral trochlea?



Fig 1 The full thickness loss of cartilage in the trochlea.

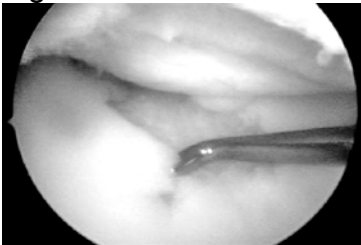


Fig 2 Microfracture of the grade 4 lesion.

This is a disabling lesion for the athlete, and a difficult management problem for the surgeon. I think that the Italians are on to the next level of treatment with the use of the hyaluronic patch impregnated with chondrocytes.

This is a clinical paper on the subject by Alberto Gobbi.



Fig 3. DJ learning something from Alberto Gobbi.

Clinical Results in Patellofemoral Full Thickness Chondral Defects Treated with Hyalograft®-C: A Prospective Study at 2-years Follow-up

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Summary

Osteochondral defects of the patellofemoral joint remain a challenging condition for the practicing orthopaedic surgeon. From earlier techniques of palliative and reparative treatment with variable results, newer methods of cartilage

regeneration have been developed through the application of tissue engineering technology. In this prospective investigation, 24 patients with either ICRS grade III or IV patellofemoral chondral lesions were treated with Hyalograft C. Subjective and objective data obtained using VAS pain scores and ICRS-IKDC 2000 evaluation forms demonstrated significant improvement. MRI, second-look arthroscopies, and biopsies taken correlate with clinical outcome. This investigation demonstrated the viability of this technique in resurfacing damaged articular surface with significant improvement of symptoms.

Introduction

Osteochondral defects of the patellofemoral joint still remains a challenge when encountered in the orthopaedic practice. Earlier techniques of surgical treatment included debridement, drilling, osteo/chondroplasty, microfracture and spongyalization. However, results obtained from these techniques have been variable.

Recent advances in the field of tissue engineering has found clinical application in addressing this pathology making it a potential therapeutic option for cartilage regeneration. Results obtained with autologous chondrocyte implantation (ACI) demonstrated its viability in repairing damaged cartilage. However, certain limitations have been associated with the procedure prompting the development of alternative means of delivering cultured chondrocytes. The aim of our prospective study was to evaluate the efficacy of Hyalograft[®]-C, a hyaluronan-based scaffold cultivated with autologous chondrocytes, in a group of patients with full thickness patellofemoral defects.

Materials and Methods

We conducted a prospective evaluation of 24 patients treated with Hyalograft[®]-C (Fidia Advanced Biopolymers, Abano Terme, Italy) at our institutions for patellofemoral chondral lesions. There were eleven males and thirteen females with an average age of 30.5 yrs. (15 - 56). Nine patients had previous knee trauma, ten had chronic knee pain, four knees had malalignment and osteochondritis dissecans (OCD) was evident in one case. Previous surgeries included: knee arthroscopy (4), chondroplasty (4), meniscectomy (3), lateral retinacular release (2), and patella re-alignment (2). Surgical technique consisted of two stages, where the initial procedure included diagnostic arthroscopy and biopsy to isolate chondrocytes for in vitro cultivation. The engineered graft (Fig 1) was then implanted at the lesion site three to four weeks later (Figs 2a & 2b). Surgical technique for implantation of grafts was through a mini arthrotomy approach in six cases (Fig 3) while in 18 cases the procedure was done arthroscopically (Fig 4).

The mean follow-up period was 24.75 months (6-48). Subjective and objective evaluation was carried out pre-operatively and then at 12 and 24 months post-operatively with Visual Analog Scale (VAS) for pain assessment and International Cartilage Repair Society-International Knee Documentation Committee (ICRS-IKDC) 2000 scores to document knee effusion, motion deficit, ligament stability, compartment findings and harvest site pathology. Patients

underwent imaging studies with MRI (Fig 5) at 12 months. In three patients second-look arthroscopy and biopsy was performed. Data obtained was analyzed statistically using the Student- T Test.

Results

A total of 24 patellofemoral lesions were examined in this series. Eighteen (75%) were localized in the patella while six (25%) were found in the trochlea. The chondral lesions had a mean surface area of 3.5 cm² (1-12). Nineteen lesions (79.2%) were classified as ICRS grade IV while five lesions (20.8%) were grade III. Significant improvement ($p < 0.001$) was demonstrated with VAS pain score and subjective evaluation using the ICRS 4-level scale on final evaluation. Eighty percent demonstrated an improvement in quality of life. A statistically significant ($p < 0.001$) improvement was also documented with ICRS-IKDC scoring systems at 24 months post-implantation. MRI taken 12 months post-operatively showed an almost normal cartilage surface in 70% of the defects treated with positive correlation to clinical outcomes. Direct visualization of grafted areas on second-look arthroscopies demonstrated good integration of the graft with the surrounding cartilage while biopsies taken were characterized as hyaline-like cartilage (strong GAGs and collagen type II expression, absence of collagen type I, and presence of cell-isogenic units)(Fig 6).

Conclusion

Based on the results obtained, we conclude that Hyalograft[®]-C is a viable option for treatment of patellofemoral cartilage lesions particularly for those with large dimensions. Advantages offered by this technique include easy handling and application of graft material via minimally invasive or arthroscopic techniques. Longer follow-up and greater number of cases for assessment will allow confirmation of the long-term durability of this new technique for repairing damaged cartilage.

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The NFL Team Physicians survey on Shoulder Injuries – James Bradley.

I asked Jim to share the experience from the survey of NFL team physicians on shoulder injuries. He presented this information at the Boston Shoulder and Sports Symposium in October of this year. This has also been

submitted for publication in AJSM. This data was collected over 8 years, 1996-2003, and the injury pattern was correlated with the position played over number of plays.

The most commonly injured position was the running back:

Running Backs – 25.1 per 10,000 plays

Quarterbacks -- 2.2 per 10,000 plays

Wide receivers - 1.73 per 10,000 plays

Tight Ends - 1.6 per 10,000 plays

Offensive linemen .65 per 10,000 plays

When the type of injury was examined:

AC Joint Injury

Running Backs 2.1

Wide receivers 1.6

Quarterbacks 1.3

The quarterbacks had the highest rate of injury, with more time lost.

Anterior Shoulder Dislocation

Running Backs .29

Tight Ends .20

Line backers .17

Quarterbacks .15

The tight ends had the highest rate of posterior shoulder dislocations.

In summary there was a definite trend in the type of injury and the position played. This was attributed to the different skills that are required for each position.

The running back and quarterback have the highest shoulder injury rate of all the positions played in professional football.

Do we need a double bundle ACL reconstruction?

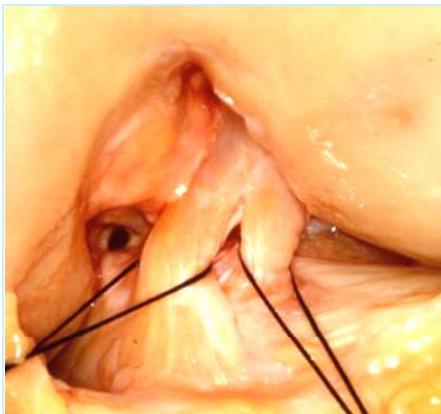


Fig 5 The 2 anatomic bundles of the ACL

There is an interesting editorial in the latest Journal of Arthroscopy on the subject by Chris Harner and Gary Poehling. They ask: what are the indications for a double bundle ACL? Are the risks of fracture of the femoral condyle increased? Is the outcome better with 2 bundles? (only a randomized clinical trial

will answer that question.) Will there be more graft impingement due to the separation of the tunnels and increasing the footprint of the graft? Will making 4 tunnels increase the rate of failure? These are all valid questions. Now, after all those unanswered questions, I have decided to include instruction in the technique (by Freddie Fu) at the summer Masters knee course in Chicago.

To bring us up to date in North America, I have asked Alberto Gobbi to share his experience with the 2 bundle technique.

Double Bundle ACL Reconstruction: Double Trouble? By A. Gobbi and R. Francisco

The conventional technique of anterior cruciate ligament reconstruction was primarily designed to replace the anteromedial bundle with the preferred femoral tunnel placement located at the 11 o'clock position for the right knee. Although the results obtained with this technique have generally been viewed as successful in restoring anterior knee stability, current studies have questioned its ability in providing rotatory stability.

Anatomic and biomechanical studies demonstrated that the ACL is composed of two major individual fascicles. To achieve a more anatomical repair, and consequently improve the results of single bundle techniques, reconstruction of both the anteromedial and posterolateral bundles (double-bundle technique) have been developed. The concept of achieving such reconstruction is not a new one. As early as 1983 Mott¹ and Zaricznyj² had already described a technique for double bundle reconstruction. However, it was not until 1997 that Rosenberg et al.³ were able to introduce an arthroscopically assisted double-bundle procedure (bi-socket technique) using a solitary tibial tunnel combined with two femoral tunnels. Further modifications by Muneta et al^{4,7,8} resulted in the introduction of an arthroscopically assisted double-bundle reconstruction with two tunnels in both the femur and the tibia. In this technique, the 1:30 femoral tunnel position for the left knee was the preferred placement for the posterolateral bundle. Data obtained from their series reported better anterior stability compared to the single-bundle technique with fewer patients noted to have more than 5 mm differences as measured with the KT-1000 arthrometer. A similar study by Hamada, Shino et al⁵ have also demonstrated better anterior stability with the bi-socket technique. They also reported better isokinetic results when the gracilis tendon was spared and using only the semitendinosus tendon for reconstruction. However, they also cautioned surgeons that although there are advantages with the use of this type of reconstruction, several questions remain, specifically that related to the optimal tensioning method and flexion angles for each bundle during tibial fixation. Early results showing the superiority of a double bundle construct against conventional single bundle reconstructions have also been supported by robotic / UFS testing system studies conducted by Woo, et al.¹¹

On the other hand, it is also important to mention that there are also studies like that of Adachi, Ochi et al¹⁰ which have demonstrated no significant differences in clinical outcome between single and double bundle techniques.

Our experience with the 2-bundle ACL reconstruction is confined only with the use of the Rosenberg bi-socket technique. From 2001 to 2003, 12 patients that were randomly selected, have been operated with this procedure. The average age of these athletes at the time of surgery was 27 years. In these patients, we used the semitendinosus to reconstruct the anteromedial bundle while the gracilis was utilized for the posterolateral bundle. Tibial tunnel was placed within the ACL stump and femoral tunnels at 11 and 10 o' clock respectively with inside-out technique. Femoral fixation was achieved with endobutton CL (Smith and Nephew) while tibial fixation was carried out with staples. A flexion angle of 40° was observed when fixing the posterolateral bundle while the knee was flexed to 10° when fixing the anteromedial bundle. Post-operatively, patients underwent a standardized rehabilitation program identical to that carried out for conventional single bundle reconstructions.

We then compared our results to a similar group of patients with comparable age, gender, and type of sporting activity that were operated on with a single bundle technique using quadrupled semitendinosus grafts.

At a mean follow-up of two years, our results revealed no significant difference in IKDC scores ($p < 0.05$) as 91% of those procedures using double bundle and 89% of those with single bundle ACL reconstructions were normal or near normal. Anterior tibial translation as measured by computerized knee arthrometer demonstrated a similar trend with a mean of 1.9 mm for double bundle technique and 1.8 mm for single bundle.

In the double bundle group, one patient was documented to have motion deficits (10°-120°) while another patient had impingement. In this patient with impingement, second-look arthroscopy performed six months post-ACL reconstruction demonstrated notch impingement as the posterolateral femoral tunnel was placed too anteriorly. Debridement and partial excision of impinging structures was performed. On the other hand, no complications were encountered with the use of quadrupled semitendinosus grafts.

In general, the short-term clinical outcome and anterior stability data obtained from our preliminary study demonstrated no significant differences between single bundle and double bundle (bi-socket) ACL reconstructions. The apparent advantage that this technique provides in terms of rotational stability remains to be consistently demonstrated as no validated examination technique has yet been established. The use of two separate femoral and tibial tunnels may be more anatomic but technically demanding and probably more prone to surgical errors. To minimize this problem, radiographic assessment of the guide wire positions relative to the bundles' actual femoral and tibial insertion may be

necessary. In addition, utilizing an outside-in technique with the proper guide for femoral tunnel placement may help make the technique safer and reproduceable. At present, further investigations should be carried out to confirm the long-term benefits of such a highly technical procedure.

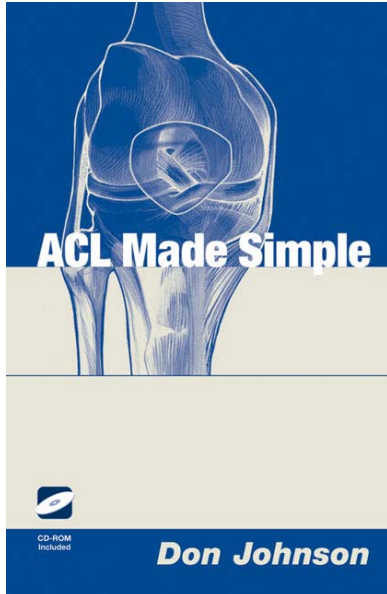
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ACL Made Simple

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.

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Upcoming Meetings

- **AANA Whistler Arthroscopy course** – Whistler BC. Jan, 5-8, 2005
Contact AANA – www.aana.org
- **Banff Arthroscopy Meeting** Feb 26-Mar 1, 2005.
Contact Dr. Mark Heard
Phone 1 403 760-2897 Fax 1 403 760-8234
Email mheard@telusplanet.net
Winter Ski Meeting with fully guided back country skiing
- **AAOS Annual Meeting** – Washington DC Feb 23-27, 2005
Contact www.aaos.org

- **AANA Specialty Day at the AAOS** – Feb 26, 2005. Washington DC
Contact AANA www.aana.org
- **ISAKOS biennial Meeting** Hollywood Florida, April 1-7, 2005
Contact www.isakos.com
- **Residents and Fellows Arthroscopy Conference** Palm Island April 22-23, 2005. Contact Karen Sousa at Linvatec - ksousa@linvatec.com
- **AANA Spring Meeting** – Vancouver BC, Canada May 12-15, 2005
Contact www.aana.org
- **San Diego Shoulder Course** - June 22-25, 2005
Contact www.shoulder.com