

Consumerism and Orthopaedics

Benjamin Joseph

Kasturba Medical College, Manipal, Karnataka, India

ABSTRACT

The meaning and implications of consumerism and its influence on the Orthopaedic Surgeon is discussed in the light of personal experiences. While it is very desirable to encourage “consumerism” in its original form, one wonders of if the newer form of “consumerism” is getting out of hand.

Contributions Of French Surgeons To The Orthopaedic World

Philippe Neyret, Elvire Servien

Hôpital de la Croix Rousse Groupement hospitalier Nord Chirurgie Orthopédique et Traumatologique Bâtiment R
Lyon, France

ABSTRACT

- How to present a five century French story in a 30mn conference?
Chronologic, Historic (Past/Modern/Future) or Surgeon contribution or orthopedics sub-specialities or geographic Lyon vs others French cities)

The past. During the second half of the XIXth century, Joseph-François Malgaigne (1806-1865) & Claude Bernard (1813-1878) introduced experimental method and statistics in medicine.

The sub- specialities **Rachis** (Cotrel-Dubousset); **HIP** cementless prosthesis (Judet) dual mobility (Bousquet) and ceramics;

Knee

- Trillat (Elmslie London 1947 and Dr Seddon pupil of Elmslie) [RCO 1964]. While going through the abstracts for the first ISK meeting to be held in Lyon in 1979,
 - Henri Dejour
1. ACL Dejour read the original paper of Bruckner (Germany) and started in 1978 to harvest a free B-PT-B graft to reconstruct the ACL. In the US, W. Clancy came to the same technical option. H Dejour used to perform a simultaneous ACL Reconstruction + Lemaire’s operation. This operation originally described by H Dejour was called the KJL. Its reliability and results led the French surgeons to abandon repair and suture of the ACL in most of cases: “free ACL graft”
 2. Comprehensive analysis of factors of Objective Patellar Instability
 3. The HLS Knee prosthesis

Shoulder P. Grammont

G Walch ...Developed with P Boileau the Aequalis® TSA; Adaptability of the humeral component (Third-generation prostheses)

Patte ’s Procedure (Latarjet +Trillat) was popularized by G Walch

The French Industry

TKA: The HLS story continues... The 3rd CONDYLE Progressive from 30° flexion onwards

UNI G Deschamps ACL insufficiency and UNI

ACL Surgery In Football Players

Philippe Neyret

Hôpital de la Croix Rousse Groupement hospitalier Nord Chirurgie Orthopédique et Traumatologique Bâtiment R
Lyon, France

ABSTRACT

Introduction Soccer is the most popular sport worldwide with 265 millions of players and 38 millions of licensed players in 2006 according to the Federation of International Football Associations (FIFA). Among them, 26 millions (10%) are women. Up to one fifth of football injuries involve the knee joint. Anterior cruciate ligament (ACL) tear is a major injury that seriously affects a player's career, with short- and long-term consequences. Conservatively managed ACL lead to an average reduction of 21% at the level of activities (Tegner score evaluation). Players with ACL tear most often desire to recover pre-injury level and then require surgical ACL reconstruction to achieve knee stability.

Epidemiology of ACL injury in football

In a review of 33 relevant articles on gender-specific ACL injury risk in football, Waldén et al. found that ACL injury constitutes less than 5% of all time loss injuries in most cohort studies regardless of the playing level. The annual prevalence of ACL injury is reported to be between 0.5 and 6% of all female players and between 0.6 and 8.5% of all male players. Female players have a 2-3 times higher ACL injury risk compared to their male counterparts and sustain injury at a younger age. In a non-contact injury mechanism, which is the most frequent, females are more likely to injure the ACL in their supporting leg, whereas males tend to injure their kicking leg (Brophy).

Results of ACL surgery in football players

1. Return-to-play

Waldén *et al.* did a prospective three-cohort study about ACL injury in elite football. Between 2001 and 2009 they followed prospectively 57 clubs (2329 players). During this period 78 ACL tears occurred, mainly during match (compared to training) and because of a non-contact mechanism in 58% of players. Almost all of them (97%) were treated surgically. They found that 94% of the ACL-reconstructed elite players returned to full elite level training within 10 months after surgery and 89% participated in elite match play within 12 months.

Elite football players seem to return to sport more rapidly than recreational players and this can be explained by personal motivation, economic reasons, and mainly optimal medical caretaking. Time to diagnosis is fast (8 days in the cohort of Waldén) due to easy access to MRI, surgery is performed 3-5 weeks after injury and the surgeons in charge of them are highly experienced in ACL surgery which could partly explain the high success rate in elite level cohorts. Caretaking is also optimal during rehabilitation and physiotherapy that are more intensive and personalized. However it does not necessarily mean that return-to-play is always ideal from a medical point of view: it could be a sign of « knee abuse » with a risk of further joint injury and subsequent development of osteoarthritis (OA).

Prediction of time to return-to-play seems to be more correlated to good hop test results (>85%) than to normal postoperative knee function (IKDC category A). (Arden)

2. Knee osteoarthritis

The patients who are treated operatively have a significantly better stability of the knee at examination (Meuffels) but there is lack of evidence to support a protective role of reconstructive surgery of the ACL against OA. In a cohort of 122 Swedish male soccer players, 41% had radiographic advanced degeneration 14 years after ACL rupture, whatever they had an ACL surgical reconstruction or not (Von Porat) For Swedish female soccer players, the results were similar with a prevalence of 51% of OA 12 years after ACL tear (Lohmander). ACL reconstruction as a single factor does not prevent the development of knee OA (Oiestad). In a cohort of 100 patients reviewed 24.5 years after ACL reconstruction, Pernin et al showed that onset of osteoarthritis is correlated with meniscal status and femoral chondral defects at time of surgery.

Prevention of ACL injury in football

The proprioceptive system is one of the more important functional parameter to train for prevention of ACL injuries. Proprioceptive training program have to be added to traditional technical training because it statistically significantly decrease the incidence of ACL injuries (Caraffa 1996) by preventing non-contact ACL injuries in soccer-players (Alentorn-Geli 2009).

Conclusions

ACL injury in soccer players is commonly treated surgically and good clinical results with return-to-play at the same elite level can be expected, but evolution to OA does not seem to be prevented by ACL reconstruction.

Use Of Orthobiologics In ACL Reconstruction

Freddie H Fu

Department of Orthopaedic Surgery, Physician Athletic Department, University of Pittsburgh, United States

ABSTRACT

Graft Healing

Healing of the graft and the tunnels after ACL Reconstruction takes time and the following stages can be distinguished:

- 0 – 10 days Inflammation/recruitment of cytokines/growth factors.
- 6 – 8 weeks Tunnel healing in bone plug grafts.
- 8 – 12 weeks Tunnel healing in soft tissue grafts.
- 20 weeks Intrinsic graft vascularization.
- 30 weeks Graft “ligamentization”/maturation.

It is currently unknown how long it takes before complete graft healing and incorporation occurs; this may also vary on a patient to patient basis.

Factors affecting Healing

Graft healing can be influenced by multiple factors:

- Tunnel position: anatomic vs. non-anatomic
 - o Positioning of the graft affects healing characteristics.
- Graft choice
 - o Allograft tissue requires a longer initial healing period when compared to autograft tissue.
 - o Bone-to-bone healing occurs earlier and stronger than tendon-to-bone healing.
- Return to activity
 - o Patients often desire to return to athletic activity early which increases risk of graft rupture.
- Orthobiological enhancements
 - o Tissue engineering and biomechanical stimulation approaches to enhance the healing process have shown promising results in mostly animal studies and include, but are not limited to, the use of a fibrin clot, platelet rich plasma (PRP), growth factors, stem cells, scaffolds, periosteum graft augmentation and autologous ruptured tissue.

Conclusions

- Orthobiologics are interesting and gaining popularity in ACL reconstruction.
- Healing takes time.
- Enhancement of ACL-graft healing is possible, but we need objective outcome measures to evaluate effectiveness.
- Orthobiological research needs to be scientifically driven and not market driven.

PCL 01

Anatomy And Biomechanics Of PCL / PCL Injuries

Wan Hazmy

KPJ Seremban Specialist Hospital, Seremban, Malaysia

ABSTRACT

Understanding the anatomy & biomechanics of PCL will not only make us appreciate the complexity of the the ligament and its surrounding structures but will help us to strive for a better management approach in dealing with PCL injured patients. It will furthermore enhance our knowledge on the operative challenges and the anticipated outcome which make it an interesting subject to be explored. The speaker will be discussing the basic and functional anatomy of PCL, its biomechanics significance and the importance of its clinical & radiological evaluation.

Remnant PCL Will Work In PCL Reconstruction

Young Bok Jung

Bone & Joint center, Hyundai General Hospital, South Korea, Korea

ABSTRACT

Background: In PCL injuries, the PCL remnant status are difference which depend on the severity of injury and potential of healing. The purpose of this study was to compare the clinical results at a 2-year follow-up with three techniques: (1) the remnant PCL-augmenting procedure with transtibial tunnel technique in the acute or subacute stage 2) tensioning of remnant PCL using modified tibial inlay technique with single bundle reconstruction in chronic stage 3) PCL double bundle reconstruction. **Methods:** The records of 89 primary PCL reconstructions with posterolateral corner sling between April 2004 and March 2008 were analyzed retrospectively. Thirty four patients were treated with PCL remnant preserving augmenting ALB reconstruction using transtibial tunnel technique in acute and subacute stage of the injury (G1); Forty patients were treated with remnant PCL tensioning and ALB reconstruction with modified inlay technique in chronic stage (G2); and fifteen patients were treated with double bundle reconstruction using modified inlay technique (G3). An Achilles tendon allograft was used in PCL double bundle reconstruction and autogenous hamstring tendons were used the other two groups. PLC reconstruction was performed with autogenous hamstring tendon through fibular head tunnel in all patients. Double bundle reconstruction was done if there was no remnant PCL or very weak PCL remnant by MRI and arthroscopic finding in subacute or chronic stage. Each patient was evaluated by the IKDC and OAK score, the mean side to side difference as measured on Telos stress radiographs, and a KT-1000 arthrometer. **Results:** The mean side-to-side differences in posterior tibial translation were reduced from G1; 10.1 ± 2.5 mm, G2; 10.6 ± 2.4 mm, G3 ; 12.8 ± 3.2 mm preoperatively to G1; 2.3 ± 1.4 mm, G2; 2.3 ± 1.5 mm, G3; 4.0 ± 2.5 mm at last follow-up on the stress radiographs ($p=0.022$). The final IKDC score was in G1; A in 21 (62%), B in 9 (27%), C in 3 (9%) and D in 1 (3%) in G2; A in 16 (40%), B in 21 (53%), C in 3 (7%) in G3; A in 3 (20%), B in 9 (60%), C in 2(13%), D in 1 (7%). The average OAK score improved from 71.7 ± 9.2 to 85.0 ± 6.7 in G1, from 65.8 ± 10.4 to 87.8 ± 7.6 .in G2 , from 71.3 ± 12.7 to 83.0 ± 5.8 in G3. Posterior instability was recurred more than 10mm compare to contralateral side one case each in G1 and G3. **Conclusions:** Excellent posterior stability and good clinical results were achieved with the anterolateral band reconstruction preserving injured remnant PCL in acute and subacute and remnant PCL tensioning in chronic stage. In double bundle reconstruction group the result was not the same as remnant tensioning or remnant well preserving group. PCL remnant would be helpful to get posterior stability and to get good clinical results.

PCL 03

Double Bundle PCL Reconstruction With Achilles Tendon

Reza Ng Ching Soong

Kuala Lumpur Sports Medicine Centre, Kuala Lumpur, Malaysia

ABSTRACT

My presentation for this symposium is based on our hospital, Kuala Lumpur Sports Medicine Centre, experience using Achilles tendon double- bundle posterior cruciate ligament reconstruction popularized by David A. Mcquire *et al* in 2010. This presentation will give general and comprehensive information on several areas of this technique, namely the surgical techniques, the choice of graft and the post-operative rehabilitation. The aim of this presentation is to provide better insight of this technique in relation to case studies. In our experience, we found that using double-bundle technique yielded better results as compared to the single-bundle technique. This is supported by several other studies comparing the single-bundle and double-bundle femoral tunnels techniques, whereby the double-bundle techniques provide more stability.

Revision PCL Reconstruction By Double Bundle Technique With Use Of Modified Tibial Inlay Method

Young Bok Jung

Bone & Joint Center, Hyundai General Hospital , South Korea, Korea

ABSTRACT

Background: Revision of an unsuccessful posterior cruciate ligament (PCL) reconstruction is a complicated clinical procedure with an outcome that may be less satisfactory than that after a typical primary PCL reconstruction. The purpose of this study was to evaluate the reasons for failure of primary PCL reconstructions and to determine the clinical outcomes of revision PCL reconstruction after a minimum of two years of follow-up. **Methods:** Forty revision PCL reconstructions were performed by a single surgeon. Four cases that involved diverse operative procedures and two cases with a duration of follow-up of less than twenty-four months were excluded; the outcomes of the remaining thirty-four reconstructions were analyzed at the time of the latest follow-up (at least twenty-four months postoperatively). A technique involving a double femoral tunnel, a modified tibial inlay, and Achilles tendon allograft was used in all thirty-four of these revision reconstructions. Twenty three patients (67.6%) underwent concomitant reconstruction of posterolateral corner structures. Knee stability was measured with use of posterior stress radiography as well as with a maximum manual displacement test utilizing a KT1000 arthrometer. The subjective International Knee Documentation Committee (IKDC) and objective Orthopädische Arbeitsgruppe Knie (OAK) scoring systems were used to evaluate the clinical outcome. **Results:** Fourteen (40.9%) of the primary PCL reconstructions most likely failed because of a single factor and twenty (59.1%) most likely failed because of multiple factors. The most common probable causes of failure were posterolateral rotatory instability (23 knees, 67%) and improper graft tunnel placement (15 knees, 44%). Side-to-side differences during posterior stress radiography improved from 9.9 ± 2.8 mm preoperatively to 2.8 ± 1.8 mm at the time of the latest follow-up ($p < 0.001$). The subjective and objective clinical scores at the latest follow-up evaluation were significantly better than the preoperative scores ($p < 0.001$). **Conclusions:** Arthroscopic revision PCL reconstruction with use of the modified tibial-inlay double-bundle technique improved knee stability, as measured with posterior stress radiography and clinically, and outcomes. Associated posterolateral rotatory instability should be surgically corrected during PCL reconstruction to prevent graft failure resulting from abnormal opening of the lateral aspect of the tibiofemoral joint.

Arthroscopic Fixation Of PCL Avulsion Fracture

Azmi Abdul Latif

Hospital Kuala Lumpur, Malaysia

ABSTRACT

Displaced PCL avulsion fractures have commonly been treated by open reduction and internal fixation. Conservative treatment has led to high rate of nonunion. Various types of materials have been described for fixation which include screws, bone staples, wires and sutures. Posterior approach is commonly used to repair the PCL and this usually involves incision posteriorly or posteromedially. The popliteal vessels and nerve are at risk. This approach does not allow assessment of other intrarticular structures unlike arthroscopic approach which allow complete examination of combined injuries with simultaneous treatment of any concomitant injuries. Arthroscopic PCL fixation is gaining popularity and several studies reported good results comparable with open technique. Various arthroscopic techniques have been described in the literature and mostly require more than two portals. Antegrade or retrograde fixation using screws with or without washer, K-wire fixation, suspensory device and suture fixation through single or double tunnels as well as transfemoral fixation have been reported with satisfactory results. Size of the bony fragment determines the type of suitable fixation. Arthroscopic reduction and fixation of PCL avulsion fracture is indeed a highly demanding procedure however with practice this becomes less complicated as arthroscopic skills are acquired.

Rehabilitation After PCL Reconstruction

Arshad Puji

Athroscopy & Sports Injury Unit Orthopedics Department, Hospital Kuala Lumpur, Malaysia

ABSTRACT

The purpose of this lecture is to present the latest advances and current concepts of rehabilitation protocols addressing the PCL injuries after surgical repair or reconstruction. The specific approach directed to properly support the limb in acute post op care, increase range of motion, regain quadriceps and hamstring strength and prescribe sensori-motor training while protecting the repaired structures and grafts are the key point to address these injuries.

Key points:

Specific Rehabilitation Techniques for PCL injuries or reconstruction

Current approach to support the limb in acute post op care

Current approach for increase range of motion after PCL injuries

How to strength quadriceps in OKC and CKC without compromise tissue healing When is the time frame to start hamstring strengthening

- Rehabilitation approach in the first 2 weeks
- Rehabilitation approach in the first 2 - 6 weeks
- Rehabilitation approach in the first 6 - 16 weeks
- Rehabilitation approach in the first 4 - 6 months
- Rehabilitation approach in the first 6 - 12 months
- Functional Evaluation and Return to Sports (RTP) criteria

SP 011

Factors Of Patellar Instability

Hishamudin Masdar

Orthopaedic Surgeon, Orthopaedic Department, Selayang Hospital, Kuala Lumpur, Malaysia

ABSTRACT

Patellofemoral disorders represent 20–40% of all knee problems and can be one of the most common complaints in sports related injuries. Patellofemoral joint instability is a multifactorial problem with great variability and severity of anatomical deformities. We addressed the factors of patellar instability based on the anatomical principle and divide them into; fundamental factor, principal factors and secondary factors. Trochlea dysplasia is the fundamental abnormality without which recurrent patellar patella dislocation is rare. The trochlear dysplasia itself is rarely addresses, instead, surgical treatment addresses the three principal factors; tibial tubercle-trochlear groove offset, patella alta and patella tilt when they are present. The other factors, collectively known as secondary factors is thought to be associated with recurrent patella instability. They may have negative effect on outcomes of conservative management of patellar instability and therefore, influence treatment recommendations. These factors include female sex, genu recurvatum, generalized or local ligamentous laxity, genu valgum, femoral anteversion, positive family history of patellar dislocation and a younger age at the time of initial dislocation. These factors contribute to our understanding of trochlear dysplasia and patellar instability, but do not provide clear indications for treatment of individual patients.

Clinical And Radiological Assessment

Philippe Neyret, Elvire Servien, Sébastien Lustig, Guillaume Demey

Hôpital de la Croix Rousse Groupement hospitalier Nord Chirurgie Orthopédique et Traumatologique Bâtiment R
Lyon, France

ABSTRACT

Clinical examination must be symmetrical and comparative. The clinical evaluation of the patellar instability is difficult. Different clinical tests can be used: the apprehension test, the J sign and more recently the test of Fithian.

In order to detect morphological predisposing abnormalities imaging is primordial.

Radiological evaluation of the patellofemoral joint includes several planes.

Two examinations are necessary for a complete evaluation of the patellofemoral joint – conventional radiology and computed tomography (CT) scans.

The radiological evaluation comprises three standardized planes:

- Monopodal antero-posterior view. This plane is not important for the patellofemoral joint, but it is important to show femorotibial abnormalities.
- Lateral view. The patient is placed supine with the knee at 30° of flexion. The profile radiograph is strictly lateral, with the posterior borders of the two condyles superimposed. The central ray is focused along the femorotibial articular line.
- Axial view of the patella with the knee at 30° of flexion. This plane is not so important but shows osseous abnormalities of the patellofemoral joint.

By definition, the analysis of the joint includes evaluation and relation of the two anatomical structures. For the patellofemoral joint, this includes the trochlea and the patella. During the last 80 years, a multitude of morphological factors of patellar instability have been documented, such as trochlear dysplasia, patella alta, patellar tilt and excessive tibial tuberosity–trochlear groove distance. These factors of patellar instability have been identified and documented by comparing a group of patients with episodic patellar dislocations and a control group. In order to analyse the patellar tendon, the cartilage and morphological abnormalities magnetic resonance imaging also (MRI) can also be done.

Proximal Management Of Patellofemoral Instability

Philippe Neyret, Elvire Servien, Sébastien Lustig, Guillaume Demey

Hôpital de la Croix Rousse Groupement hospitalier Nord Chirurgie Orthopédique et Traumatologique Bâtiment R
Lyon, France

ABSTRACT

Proximal management of episodic patellar dislocation (EPD) can be schematically divided into two different procedures, the Vastus medialis obliquus (VMO) reefing and the medial patellofemoral ligament (MPFL) reconstruction. Since 2005, we performed an MPFL reconstruction instead VMO plasty. The purpose of this study is to evaluate prospectively the results of MPFL reconstruction for EPD, we hypothesize that the MPFL reconstruction is effective on the patellar instability and patellar tilt. **Materials And Methods:** A prospective study was made between June 2005 and June 2007. MPFL reconstruction using the semitendinous (n=30) or the gracilis tendon (n=5) was performed in 35 knees (32 patients) with EPD, according to the D. Fithian's technique. Technique of MPFL reconstruction is described. The scoring systems of IKDC and Kujala were used for the assessment of the results. Assessment included physical examination, range of motion (ROM), test of Fithian and apprehension test were. CT-Scan were obtained in all patients before the surgery and prescribed at 6 to 12 months follow-up. **Results:** There was no redislocation and subluxation in any of the 32 knees (30 patients) reviewed at a mean follow-up of 18 months (12-34). At the final follow-up, all knees had full ROM. Only two knees presented a positive Fithian's test and an apprehension test. The mean preoperatively IKDC score was 52 ± 9.2 (range, 38 to 76) and 77 ± 12.2 (range, 54 to 98) at follow-up. The mean postoperatively Kujala score was 81 ± 9 (range, 65 to 96). The complications were represented by 4 ruptures of the distal patellar tunnel (without fracture) and 3 knee's stiffness with favorable evolution after arthroscopic arthrolysis. In the group of isolated MPFL reconstruction (n=22), the mean Caton index was 1.1 ± 0.1 (range, 0.8 to 1.2) preoperatively and 1.08 ± 0.1 (range, 0.8 to 1.2) at follow-up. In this group, we have obtained 18 CT-scan postoperatively. The mean patellar tilt with relaxed quadriceps was 21.4 ± 6.1 (range, 12 to 36) preoperatively and 16.4 ± 2.7 (range, 11 to 20) (P=0.03) at follow-up. The mean patellar tilt with contracted quadriceps was 28 ± 8.4 (range, 17 to 39) and 20.5 ± 7.5 (range, 14 to 32) (P=0.03) at follow-up. After MPFL reconstruction, the patellar tilt increased of 4.1° with contracted quadriceps. **Conclusion:** Up to date, we practice an MPFL reconstruction instead of Insall's muscular reefing according to these preliminary encouraging results.

Bony Procedure And Episodic Patellofemoral Instability

Philippe Neyret, Elvire Servien, Sébastien Lustig, Guillaume Demey

Hôpital de la Croix Rousse Groupement hospitalier Nord Chirurgie Orthopédique et Traumatologique Bâtiment R
Lyon, France

ABSTRACT

We shall focus on Trochlear dysplasia because this is the most frequent anatomical abnormality encountered in Episodic Patellar Dislocation even if, this procedure is rarely indicated. Tibial tubercle osteotomy will be presented in other presentations. **Introduction:** Albert Trillat and Henri Dejour from Lyon contributed to the understanding of patello femoral disorders. A very long time ago (1915) Albee described the elevation of the lateral facet. This gesture is illogical and not physiological, but it may be efficacious, raising the lateral slope of the trochlea to counter the luxation. It can be indicated only in the absence of bump. Albee procedure doesn't reduce the prominence, but it elevates the lateral facet and increases forces across the lateral PF joint leading to patellofemoral arthrosis. So Henri Dejour and G Walch suggested to decrease the bump by a "deepening trochleoplasty". Recently, A Amis validated in vitro the effect of this type of trochleoplasty. **Technique:** In the original technique the subchondral bone is removed using a burr with a probe allowing to protect the cartilage. Once the new articular shape of the trochlea is created the two facets are fixed with small staples. The technique was slightly modified by Donell S and Verdonk P. Bereiter used trans-osseous non-absorbable sutures to maintain the deepening or the trochlear groove. **Indications:** In our Lyon's experience deepening trochleoplasty is indicated in case of severe trochlea dysplasia (bump > 6mm) abnormal patellar tracking or recurrent postoperative patella dislocation. This procedure is often associated with other gestures (Steiner TM). **Results:** Early results were published by Verdonk, Donell, Ulting and also Koeter. Today we can consider this technique as very demanding; Early results are encouraging in literature with 80% good or excellent. P Schottle demonstrated that the risk for cartilage viability after trochleoplasty is very low. Nevertheless we do not know the results at very long term and unfortunately this indication is often discussed in very young patient.