



**COMITÉ OLÍMPICO ESPAÑOL**

**COMISIÓN MÉDICA**

**X**

**JORNADAS SOBRE MEDICINA  
Y DEPORTE DE ALTO NIVEL**

**3ª CONFERENCIA:**

**“Hombro del lanzador y  
conflicto posterosuperior de hombro”**

**PONENTE:**

**Christophe Levigne**

## CHRISTOPHE LÉVIGNE, MD



### Christophe Lévigne

is a french orthopedic surgeon specialized in shoulder surgery.

He graduated with his M.D. in 1988 from the university of Lyon, France.

After regular medical school, he was involved with the french national ski team for one year as the team doctor, covering all the downhill races of the world cup and the 1984 Sarajevo Winter Olympic Games.

During his four years of surgical residency (1984-1988), he had the chance to meet and to work with Gilles WALCH who was at this time assistant professor of Professor Henri DEJOUR, and already involved in shoulder pathology.

He spent 6 months in 1989 in North America, as a visitor fellow in numerous American and Canadian shoulder and knee surgery centers. Sport surgery was one of his choice selection criteria and he had the chance to visit James Andrews in Birmingham (Alabama), Harvard Ellman and Stephen Snyder in Los Angeles (California), Robert Cofield in Rochester Mayo Clinic (Minnesota) James Esch in San Diego (California), Russell Warren and his team in New York, Richard Caspari in Richmond (Virginia) and others.

Back to Lyon, he spent 2 years as assistant professor in the orthopedic surgery unit of Professeur Henri Dejour, continuing close relationship with Gilles Walch, already very active and well-known in shoulder surgery field.

Dr Lévigne went into private practice in 1991 joining the orthopaedic Clinique du Parc in Lyon, where he is practicing currently. Until 2007, he had conjointly successive positions in University hospital, entirely devoted to shoulder surgery since 1993, when Gilles Walch left the university hospital.

Dr. Lévigne is a member of numerous organisations, SECEC (European Society of Shoulder and Elbow Surgery), SFA (French Arthroscopic Society), SOFCOT (French Orthopedist Surgeons Society) and more. He has been invited to lecture in different European countries and Australia. He his author or co-author of numerous book chapters and several articles in journals such as the *Journal of shoulder and elbow surgery*, *Techniques in shoulder and Elbow Surgery*, *Revue de Chirurgie Orthopédique*.

Amongst the numerous lectures he has given, there are several recent presentations about “shoulder in sports”

- Athens-Greece. SECEC 09 2006. “Internal impingement in throwing athletes”
- San Diego-USA. AAOS 02 2007. “Posterosuperior glenoid impingement”
- Lyon-France. GREP 03 2007. “Le conflit glénoïdien postérieur »
- Bahia-Brazil. ICSS 09 2007. “Arthroscopic glenoplasty for posterosuperior glenoid impingement”
- Paris-France. SOFCOT 11 2007. « Glénoplastie arthroscopique pour conflit glénoïdien postéro-supérieur »
- Nice-france. NSC 06 2008 “Arthroscopic glenoplasty for posterosuperior glenoid impingement”

When Christophe takes time to avoid burning-out, he enjoys meeting friends and practicing sport (running, skiing or golfing), but having quiet time with Valérie, his wife, Lou and Clara, their children, is definitely the “must”.

# POSTERO-SUPERIOR GLENOID IMPINGEMENT IN THROWING ATHLETES

**-interest of arthroscopic posterior glenoplasty-**

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Posterosuperior glenoid impingement (PSGI) has been described in 1991 by Walch as a mechanism of shoulder pain in throwing athletes. It is an internal impingement of the articular-side of the insertion of the supraspinatus tendon against the posterosuperior rim glenoid, in the combined movement of abduction and extreme external rotation (figure 1) (1). In this position, both elements are in contact, as demonstrated anatomically by Jobe (2). The contact is probably physiological in a large proportion of normal population. The hypothesis is that thousands of cycles, as during throwing sport activity, may create a real impingement with pathological changes. These include various grades of tendon injury (tendinopathy, articular partial tear, complete tear) and various types of posterior glenoid rim injury (labral lesion, marginal chondral lesion, glenoid cyst, glenoid spur).

## **Is impingement responsible for pain?**

Different hypotheses are debated:

- Jobe and other authors defend the theory of a subtle anterior instability as the etiologic factor, arguing that the majority of these athletes have a positive relocation test (3-4). We agree that some subtle form of anterior instability may cause similar symptoms but these athletes have neither clinical or imaging signs, nor arthroscopic lesions, of anterior instability. Moreover Halbrecht observed that internal posterior impingement actually decreased with anterior instability (5).

- Burkhart considers the retraction of the posteroinferior capsule frequently observed in these athletes as the *primum movens*. His theory is that contracture induces a posterosuperior shift of the glenohumeral contact point that allows hyperexternal rotation due to the suppression of the paradoxically “protective” and natural PSGI. The hyperexternal rotation would be responsible for hypertwist of the rotator cuff fibers which may lead to tendon failures (6). However this theory did not explain the modifications of the posterior glenoid rim observed for most of the patients (7).

- We thus persisted to postulate that pain was caused by the mechanical impingement of the tendinous insertion on the glenoid rim and that tendon lesions and glenoid labral and bone modifications were resulting of the same mechanism. In this logic, we proposed since 1996 an abrasion posterior glenoplasty for these patients, in order to remove the critical abutment (8).

## **Rationale for posterior abrasion glenoplasty**

The first argument was the fair results of soft-tissue arthroscopic debridement (9-11). In the series of Riand, only 16% of the 75 throwing athletes were objectively able to resume their former sport level, and only 40% were satisfied with the result of the procedure.

Secondly, bony spur of the posterior glenoid rim was very frequent in this population and the idea of a painful abutment seemed mechanically logical (figure 2).

Finally, there was no evidence for potential complications after abrasion of excessive bone.

## **The series**

Between 1996 and 2005, we performed 15 consecutive cases of arthroscopic posterior glenoplasty. Age averaged 25 years (range, 18-33). All athletes were involved in competitive throwing or smashing sport (handball 9, volleyball 4, tennis1, javelin1). 11 athletes performed in regional league, 4 in national league.

Pain in abduction-external rotation was the major symptom in all patients. Partial tear of the articular side of the supraspinatus tendon was present in 6 cases on CTarthrography (figure 3). Posterior glenoid rim was analyzed on radiography and CTarthrography: hypertrophy, spur or ossification was present in 7 cases, remodeling in 4 cases and it was normal in 4 cases

Conservative treatment with specific rehabilitation has been tried for every patient for a minimal period of three months, before decision of arthroscopy.

## **The procedure**

All patients had general anesthesia. The position was lateral decubitus in 11 patients, beach chair in 4 patients. The scope is in regular arthroscopic posterior portal (soft point), ideally a little more lateral and inferior. Instrumental portal is antero-superior, generally just anteriorly to the acromioclavicular joint, but the accurate position and direction are naturally checked primarily with a needle. The goal is to be exactly tangential to the convexity of the posterior glenoid rim.

Exploration includes the insertion of the supraspinatus and infraspinatus and posterior glenoid labrum and cartilage. All the cases had arthroscopic partial tear of the cuff insertion, but three were only detected after positioning the arm in critical position (abduction-extension-external rotation) (figure 4). This manoeuvre is essential to confirm the diagnosis, stating that the tendon lesion impinges on the glenoid rim. On the glenoid side, labrum was pathologic in all cases with various aspects (figure 5). Spur was easily detected and palpated when present.

Extensive posterior labral debridement with motorized shaver has been done in all cases, removing all the pathologic tissue without any reinsertion. The debridement is often driven until the postero-inferior part (seven o'clock position).

The glenoplasty is performed with the motorized burr, removing the spur or the sharp rim in order to obtain a smooth angle. The spur may be occasionally a little medial to the rim. (figure 6).

The arm is then positioned again in critical position to check the absence of residual impingement. Post operative care includes rest in a regular sling for one week. Passive rehabilitation is begun the day after the operation. Daily life activities are allowed after 6 weeks and progressive sport training after 3 months.

## **Results**

The average follow-up is 54 months (12-123). Nine patients have been reviewed with personal interview and radiographies and six had telephonic questionnaire. No complication occurred. No sign of arthritis or articular osteophyte has been observed. Concerning posterior instability, one case was doubtful about a minor posterior subluxation on the Bernageau profile view after one year, but was perfectly centered on the last radiographic follow-up seven years after the procedure (figure 7).

We did not observe recurrence of ossifications of the posterior glenoid rim (figure 8).

Functional results were satisfactory. 11 athletes (73%) were able to resume their former sport level. Three athletes had to change their sport but are satisfied and continue to play tennis or swim. One athlete is disappointed, forced to give up with javelin, but still practice handball.

## Discussion and conclusion

Arthroscopic posterior glenoplasty seems to be a valuable option after failure of conservative treatment in this high functional demanding population.

Postoperative recovery is not longer than isolated soft-tissue debridement and we did not observe complications or relative clinical or radiographic problems, even with 10 years of follow-up for the two first cases.

Concerning the pathophysiology, the efficiency of the procedure may be a valuable argument to think that mechanical impingement is at least an important part of the cause of the pain.

## Bibliography

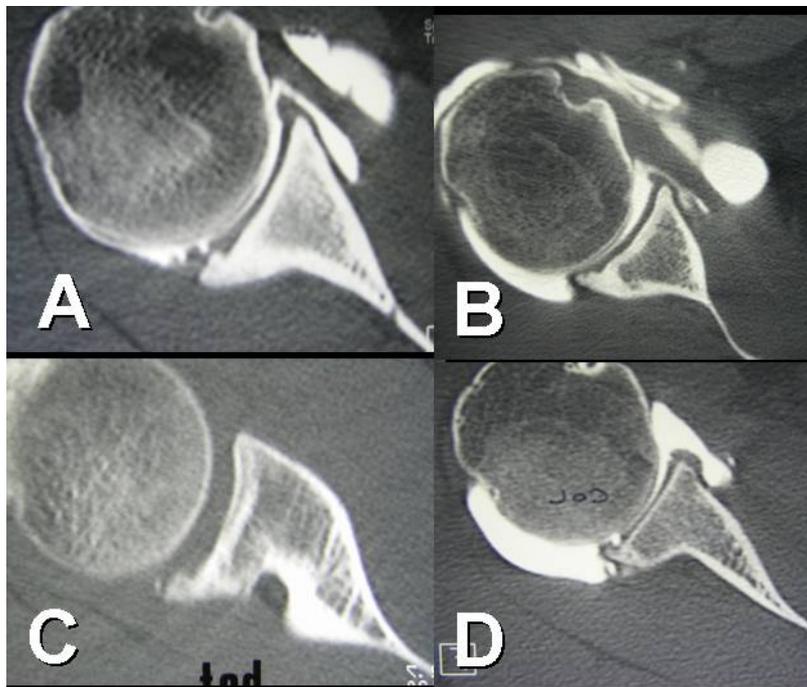
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## Legends of figures

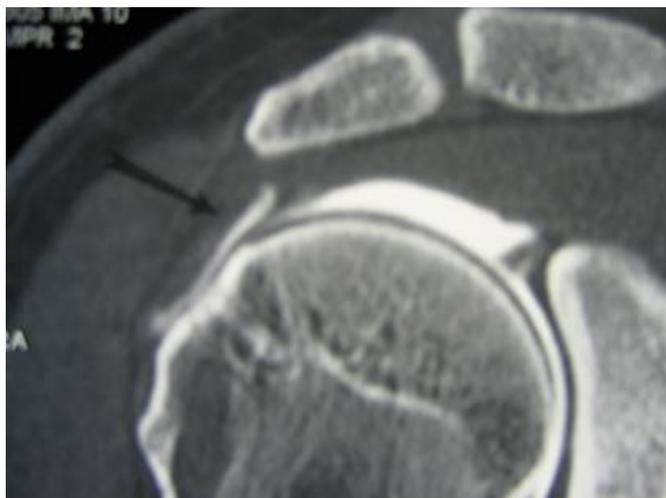
- Figure 1: Schema of postero-superior glenoid impingement
- Figure 2 : Four different cases of bony spur on the posterior glenoid rim
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A- before the procedure, B- during abrasion, C- after the procedure
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**Figure 1:** Schema of postero-superior glenoid impingement



**Figure 2:** Four different cases of bony spur on the posterior glenoid rim



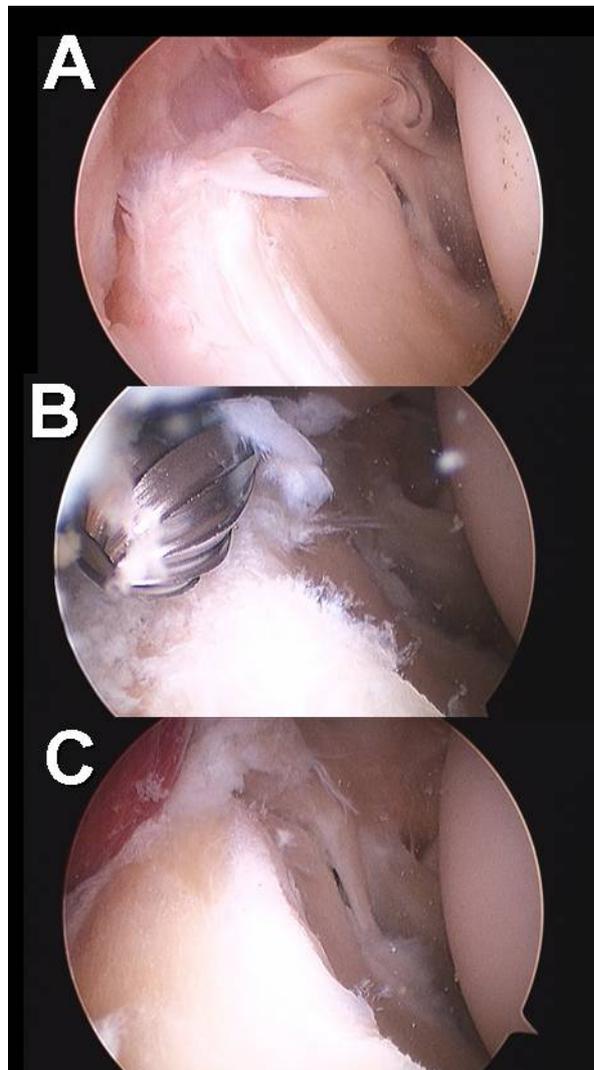
**Figure 3 :** Partial tear of the articular side of supraspinatus tendon on arthrography



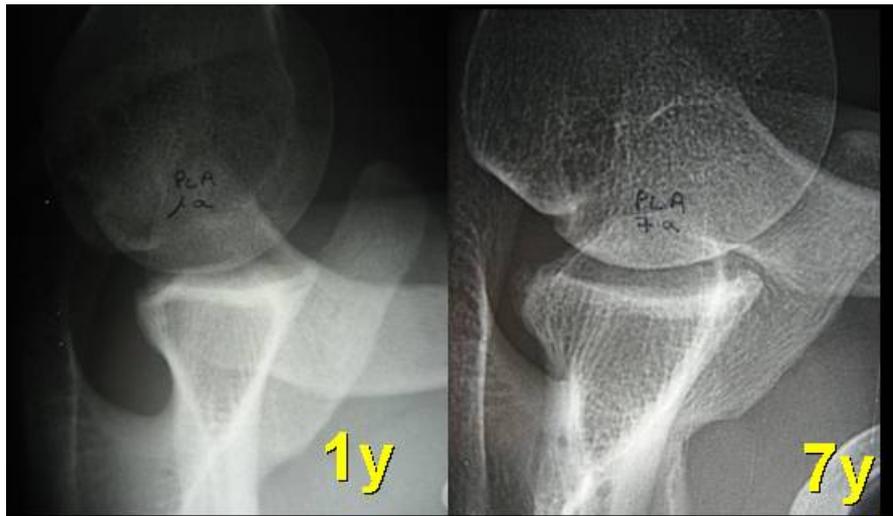
**Figure 4 :** Arthroscopic view of articular partial tear of supraspinatus



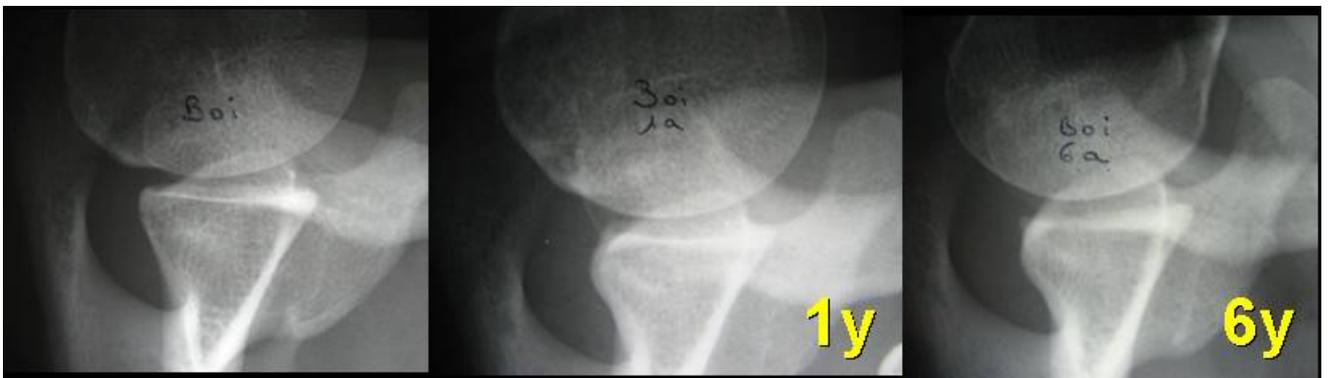
**Figure 5 :** Arthroscopic view of posterior labrum delamination



**Figure 6 :** Arthroscopic sequence of posterior glenoplasty :  
*A-before the procedure, B- during abrasion, C- after the procedure*



**Figure 7 :** Minor posterior subluxation on Bernageau view at 1 year follow-up (left), not confirmed at 7 years follow-up (right)



**Figure 8:** Radiographic aspect of glenoplasty on Bernageau profile view: before the procedure (left), at 1 year follow-up (center), at 6 years follow-up (right)