

# Hyaluronic acid in healing cartilaginous pains of the athletes (new prospects)



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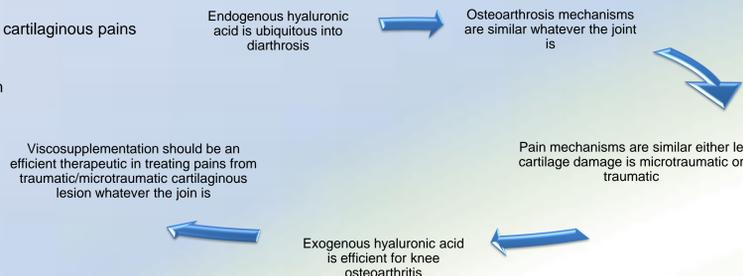
## Introduction:



### Athlete's problem

- Repeated high articular stress
- Early appearance of traumatic/microtraumatic cartilaginous pains
- Hurt joint related to specific sport's movement
- Light armamentarium
- Worse pain relief caused by sport continuation

### Basic premise



### Endogenous and exogenous Hyaluronic Acid (HA)

- Endogenous ubiquitous diholoside (hexabiose)
- Gives synovial fluid viscoelastic rheologic properties
- Involved in extracellular matrix synthesis
- Anti-inflammatory part mainly against Interleukin-1 associated with lymphocytes mobility/polynuclear phagocytosis alterations
- Production via microbial fermentation or roost combs extraction
- Exogenous AH : impaired endogenous substitute even autocrine synthesis (viscoinduction)
- Marketing authorization for symptomatic gonarthrosis (French Health Social Security)

= Old therapeutic well assessed and efficient for knee osteoarthritis

Could hyaluronic acid be an effective therapeutic in healing traumatic/microtraumatic cartilaginous pains of the athletes whatever the joint is ?



## Materials and methods:

Retrospective study (Level 4) from patients treated with HA for traumatic/microtraumatic cartilaginous injury (from June 2000 to April 2010, Centre de Biologie et de Médecine du Sport de Pau)

### Objectives:

- Assess viscosupplementation on pain's relief and sport's level
- Show efficiency variation between differents used products
- Define prognosis factors which could interfere with efficiency for shoulder, elbow, acromioclavicular joint

### Recruitment terms

#### Inclusion/ eligibility criteria

- > Age over sixteen
- > Patient spontaneously appearance or sent by doctor for cartilaginous pain of shoulder, acromioclavicular, trapezometacarpal or sub-talar joint, wrist, elbow
- > Precise diagnosis with radiological confirmation (X-rays, MRI, CT-artrography)
- > Whole viscosupplementation procedure realized and clearly established

#### Exclusion criteria:

- > Diagnosis insufficiency
- > Intercurrent disease or treatment
- > Incapacity to fill a medical form sent by e-mail, mail, or phone call

### Therapeutic terms

After given oral and written information about therapeutic terms, benefits and risks, patients underwent whole protocol in compliance with pharmaceutical firms recommendations. Each injection was preceded by 3 times disinfection and 1cc saline/xylocaïne injection (the absence of valve pushing resistance proves the good intra-articular position of the needle). Radiological guidance was used only for sub-talar joint..

The relay xylocaïne-physiological serum follows published studies asserting chondral injuries time-dependant with local anesthetics. A radiological guidance was used for needle's positioning for hip, after plan by plan anesthesia with xylocaïne.

### Evaluation terms:

Evaluation was made by medical record files plus a medical form (only patients who filled the form were included), and efficiency assessment by clinical criteria based on pain digital scale (0-10) before and after injection, either on dialy pain relief. Patient satisfaction was estimated on a ladder (from 0 to 4) just as sport/job level evolution.

#### 2 groups were defined regarding to treatment objectives:

**Group 1 :** patients with professional/sports activity > 2 hours a week soliciting the hurt joint,

**Group 2:** patients with occasional sport activity (<2 hours) and/or a non requesting hurt joint professional activity, (included patients who chose to stop requesting activity after injections).

No staging for severity was realized.

Types of sports were split up into 3 classifications for prognosis evaluation: on line/pivot sport, weight-bearing / non weight-bearing sport, amateur/professional athlete

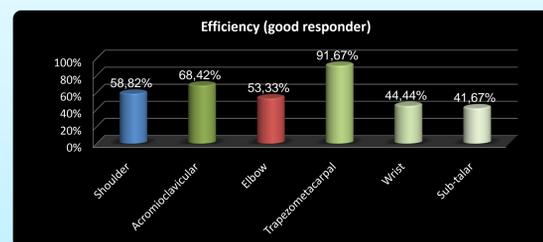
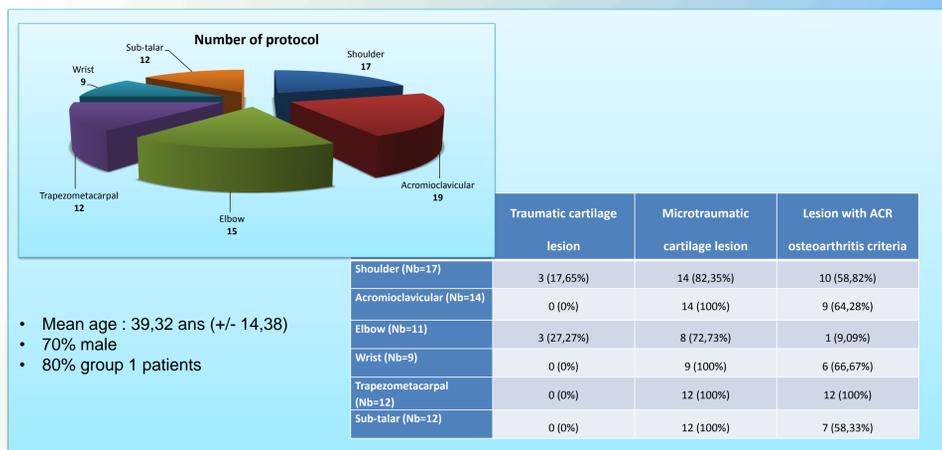


### Response criteria:

- Group 1 : Digital Pain Scale post protocole <2, associated with patient satisfaction ≥3 sport/ professional preservation,
- Group 2: Digital Pain Scale <2 associated with patient satisfaction ≥3, dialy pain relief

## Résultats:

84 protocols were realized and distributed into 6 joints; all with cartilaginous traumatic/microtraumatic injury. Some patients benefited from repetition of protocols (study=10 years). Nine products were used (about 70% for Arthrum™, Durolane™ and Sinovial™). 36 (42,85%) patients benefited first of injection of steroids because of swelling. Two side effects were notified (2,38%), represented by an extended pain over 48 hours (1) or a moderate stiffness quickly reduced (1), No infectious complication was notified.



For acromioclavicular joint, efficiency was divided into 2 pathologies, microtraumatic lesion (57,14%) and distal clavicular lysis (100%)

### Prognosis factors:

- The pursuit of a requesting hurt joint activity (sport/job) is associated with a loss of efficiency for shoulder (p=0,0595) and elbow (p=0,028).
- No biometric impact
- Preliminary steroids injection has no impact on efficiency
- No difference between the most three products used ( Arthrum™, Durolane™, Sinovial™) on efficiency

## Conclusion:

Viscosupplementation is a former therapeutic but its efficiency is not yet well established, except for knee osteoarthritis (with meta-analysis). This study is the first time in medical littérature for assessment of hyaluronic acid efficiency for wrist, sub-talar and acromioclavicular joint with encouraging results. For shoulder, results are similar to those obtained in Blaine versus placebo study and confirm that Hyaluronic acid can be efficient for pain and function in omarthrosis. In the trapezometacarpal joint, results are exceptional but medical studies have to face the high effect size of saline injection when compared HA versus placebo. For elbow our results are strictly the opposite to those found in Van Brakel's. Hyaluronic acid has allowed us to treat patients with resistant pains, the initial postulate seems to be verified, but naturally randomized studies are necessary to give a reliable assessment of efficiency with wide

sample to limit the high placebo Effect Size.

Finally, this study gives new orientations regarding researches about viscosupplementation. With confirmation, it could extend the potential scope of the hyaluronic acid and a widen use of hyaluronic acid in all joints.