Hyaluronic acid in healing non arthrosis cartilaginous pains of the athletes (about 271 cases)

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Introduction:

Athlete’s problem
- Repeated high articular stress
- Sports relative rate > 1.72
- Early appearance of traumatic/microtraumatic cartilaginous pain
- Right articular phenomenon
- Worse pain caused by sport continuation

Vicious noxious circle of cartilage
- Qualitative and quantitative hyaluronic acid alteration
- Mesh network rapid destruction
- Loss of pressure phenomenon
- Inflammatory phenomena genesis
- Increased pressure into the deep layers

Endogenous and exogenous Hyaluronic Acid (HA)
- Endogenous adipose tissue (hepatocytes)
- Gives synovial fluid exoskeletal rheologic properties
- Involved in extracellular matrix synthesis
- Anti-inflammatory properties against interleukin 1 associated with lymphocytes mobility
- Polynuclear phagocytes alterations
- Production via microbial fermentation or road coma extraction
- Exogenous AH - impaired endogenous substitute even autoimmune synthesis (viscosupplementation)
- Marketing authorization for symptomatic gonarthrosis (French Social Security)

Could hyaluronic acid be an effective therapeutic in healing traumatic/microtraumatic (early osteoarthrits stage) cartilaginous pains of the athletes

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 level
- Search remarance in case of several protocols
- Show efficiency variation between different used products
- Define prognosis factors which could interfere with efficiency (only for knee because of sufficient number of cases)

Recruitment terms
- Inclusion eligibility criteria:
  - Age over sixteen
  - Patient spontaneously appearance or sent by doctor for cartilaginous pain
  - Presence diagnosis with radiological confirmation (X-ray, MRI, CT arthrography)
  - Absence of osteoarthritic criteria to reference to the American College of Rheumatology (ostearthrosis, joint space narrowing, subchondral bone osteopenia, gait)
  - Whole viscosupplementation procedure realized and clearly established

- Exclusion criteria:
  - Diagnosis insufficiency
  - Incorrect disease or treatment
  - Incapacity to fill a medical form sent by e-mail, mail, or phone call

Résultats:

271 protocols were realized and distributed in 3 parts: all with cartilaginous traumatic/microtraumatic injury. Some patients benefited from repetition of protocols (study 10 years). Seven products were used (about 90% for Arthrom™, Durloane™ and Synovis™). 18 (6.64%) patients benefited first of injection of steroids because of swelling. Twelve sides effects were notified (4.42%), essentially represented by an extended pain over 48 hours (7), or a moderate stiffness quickly reduced (4). No infectious complication was notified.

Biometric profile

<table>
<thead>
<tr>
<th>Group</th>
<th>Bioindex</th>
<th>Knee</th>
<th>Ankle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>0.7 (54.4%)</td>
<td>1.27 (75.0%)</td>
<td>1.20 (68.9%)</td>
</tr>
<tr>
<td>Group 2</td>
<td>0.7 (54.4%)</td>
<td>1.27 (75.0%)</td>
<td>1.20 (68.9%)</td>
</tr>
</tbody>
</table>

Number of protocol

Conclusion:

Viscosupplementation is a former therapeutic but its efficiency is not yet well established, except for knee osteoarthrosis (with meta-analysis). This study is the first time in medical literature for assessment of hyaluronic acid efficiency in early stage of osteoarthrosis in knee, ankle, and hip. We note in evidence (level 4), otherwise it shows interesting results (terms of real patients) in 50% of cases, and over one year in 60-85% of cases. It can introduce a debate about interest of an earlier treatment for cartilaginous injuries, no matter the localization (knee, hip, ankle). This current debate already exists for the hip with some studies showing a loss of efficiency according to Kellgren grading severity. Our results are like for knee, ankle, and hip osteoarthrosis. Our criteria suit well with sportmen expectation, and hyaluronic acid helped us healing patients with usual drug pain resistance. 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 allow the extension of the potential scope of the hyaluronic acid and a modification of medical practices in favour of a early care of the cartilaginous lesions

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 provided by 3 times desinfaction and 1% adrenaline injection (the absence of valve pushing resistance proves the good intra-articular position of the needle). The relay radiographic-physical serum follows published studies asserting chemical injuries time-dependant with local anesthetics. A radiological guidance was used for needle’s positioning for hip, after plan by plan anesthesis with xylocaïne.

Evaluation terms

Evaluation was made by medical record like 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 level evolution.

2 groups were defined regarding to treatment objectives:

Group 1: patients with professional/sports activity > 2 hours a week soliciting the joint pain.

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).

For the knee, ICRS staging was carried out.

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

Response criteria:

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

Efficacy duration when good responder

Efficacity (post-responsible)

Prognosis factors:

- ICRS grading severity has no impact (p=0.17), neither lesion site (lumipolarar or femorotibial).
- The period of e requesting hurt joint activity (sport/activity) is associated with a loss of efficiency.
- No biomechanics impact.
- Preliminary steroids injection has no impact on efficiency (p=0.85).
- No difference between the most three products used (Arthrom™, Durloane™, Synovis™) on efficacy.