Contribution of arthroscopy for Bennett’s fractures

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Context:

• Unusual, 1-2% of fractures of hand
• Value of thumb function
• Default of articular reduction : arthrosis
• Traction of abductor pollicis longus and intrinsic muscles : closing commissure
• Many technics : wires, screws, open or closed reduction and fixation
• Miniaturization of arthroscopic equipment
Expected benefits:

• Advantages of similar reduction as open procedure
• Morbidity of percutaneous intervention
• To get an articular reduction at least equal and associated with mini-invasive procedure
• Better control in case of central impaction
Materiel and method

- Prospective, descriptive, monocentric cohort study
- 16 patients
- Operated at sport clinic between 2005 and 2018
- For an articular fracture of the base of the first metacarpal
- Diagnosticed by Xray and TDM
Classification
Outfit and method

• Installation in dorsal décubitus
• Tourniquet of the base of the arm at 250mmHg
• With plexic anesthesia
• Upper limb horizontal
  • Facility of execution
  • Fluoroscopic control
• Without traction system
Outfit and method

- Arthroscop 1,9 voire 2,7
- Shaver
- Mecanical sensor
- Sensor of radio-frequency
Outfit and method

- 2 dorsals surgical approaches:
  - Optical 1R
  - Instrumental 1U

- 1 thenarian surgical approach
Intervention

• Stabilisation by inter-metacarpal wires brochage inter-métacarpien such Iselin’s procedure, in axial traction, with fluoroscopic control
Intervention

- Articular wash
  - Debridement
  - Evacuation of hemarthrosis
  - Excision of small pieces
- Reduction
  - Joystick wire, mechanical sensor
Intervention
Intervention

- Osteosynthesis
  - Screw
  - K wires
- Testing of osteosynthesis stability
Intervention

articular outcome +/- reparation
Post operational effects

• According to stability and ligament injury
• Immediate mobilization: stable synthesis and no ligament injury
• Commissural brace 3-6 weeks
• Wires removal 6-8 weeks
• Physiotherapie from wires removal
Evaluation

- Clinical
  - EVA
  - Quick Dash
  - Opposition index of Kapandji
  - Reposition index of Kapandji
  - Opening
  - strength (Key Pinch)

- Radiological
  - Standard front and lateral Xray
Results

- 16 patients
- 15 men, 1 woman
- Mean age 28.4 (17-42)
- 8 dominant sides
- Mean follow-up 5.75 months (2-18)
Results

- EVA 0.69 (0-2)
- Quick Dash 1.28 (0-4.55)
- Opposition 9.37 (8-10)
- Commissural opening 89.87% (75-100)
- Strength 85.94 (75-100)
- Xray: material in place, no secondary displacement, consolidated fractures
- No complication
Results

• Back to professional activities faster in case of screwing without associated ligament injury
• Back to contact sports after 2-3 months with flexible protection
## Discussion

<table>
<thead>
<tr>
<th>Patient</th>
<th>Pain (Quick Dash)</th>
<th>Quick Dash (Kapandji)</th>
<th>Opposition (Commissural Opening)</th>
<th>Strength (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maugendre et Fontès</td>
<td>0.69 (0-2)</td>
<td>1.28 (0-45)</td>
<td>9.37 (8-10)</td>
<td>89.87 (75-100)</td>
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<tr>
<td>Zemirline et al</td>
<td>1 (0-4)</td>
<td>5 (0-61)</td>
<td>9 (5-10)</td>
<td>86 (58-100)</td>
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<tr>
<td>Croutzet et al</td>
<td></td>
<td>10</td>
<td></td>
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<tr>
<td>Pomares et al</td>
<td>3.1 (0-18.8)</td>
<td>9.9 (9-10)</td>
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**Introduction**

Bennett fracture [1] is a clinical problem for trauma surgeons. The aim of the detached fragments prevents the therapeutic decision, in most cases, thereby, reconstructive planning by surgeons [2] and surgeons [3] and for, in some cases, the presence of a greater than 45°, subluxation for Bennett fractures. Nevertheless, the rapid sequence of arthroscopy at trauma surgery proposed Culp and Johnson [4] to develop a percutaneous screw fixation technique including a lateral examination of the posterior inferior corner. The objectives of the validation study of this study were to evaluate whether the arthroscopically assisted screw fixation was superior to the open screw fixation. The secondary objectives were to determine whether the percutaneous method was associated with better postoperative functional scores, a shorter operative time, and a lower prevalence of heterotopic radiographic osteophytes.

**Material and method**

2.1. Study design and patients

This retrospective study included patients managed between October 2010 and June 2012 and having a follow-up of at least 12 months. Inclusion criteria were age older than 18 years and Bennett fractures with detachment of at least one-third of the distal surface. Exclusion criteria were a previous fracture at the first ray of the same hand, plate fixation, an injury-to-surgery interval longer than 15 days, and treatment at another center.

The initial evaluation included Kapandji radiographs [5] to assess the size of the fragment. Serious orthopaedic surgeons
Discussion

• Reliable technology
• Arthroscopy habit
• Good results
• Limited serie
• Comparatives studies
Thank you!