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TREATMENT OF COMMINUTED FRACTURES OF THE UPPER END OF THE HUMERUS BY THE BLIBOQUET IMPLANT

Zarouf Mahdi*, Mouad Beqqali Hassani, Moncef Boufettal, Mohamed Kharmaz, Moulay Omar Lamrani, Ahmed Elbardouni, Mustapha Mahfoud and Mohamed Saleh Berrada

Faculty of medecine of Rabat, Avenue Mohamed Belarbi El Alaoui B.P.6203 10000, Rabat.

***Corresponding Author: Dr. Zarouf Mahdi**

Faculty of Medecine of Rabat, Avenue Mohamed Belarbi El Alaoui B.P.6203 10000, Rabat.

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ABSTRACT

The concept of bilboquet, invented and used by Levon Dour¬sounian since 1995[1], is an osteosynthesis system, using a staple with a female Morse taper fixed in the humeral head, and an endomedullary stem with a Morse taper. evil that comes to fit with the cephalic staple. The tuberous synthesis can then be done on a bone-bone interface optimizing the chances of consolidation, key point of the recovery of the function.[2] We report a case of fracture of the superior end of the left humerus in a patient 51 year old victim of a fall from the stairs. The patient presented to the emergency department with an upper extremity traumatic attitude, the vasculo-nervous examination was normal. Radiography confirmed the diagnosis of a fracture with 4 fragments of the left shoulder operated with this device. This device simplifies the surgical repair of these fractures and avoids the use of the humeral prosthesis.

KEYWORDS: fracture / humerus / head retention / Bilboquet.

INTRODUCTION

Surgical management of fractures of the upper end of the humerus (FESH) is delicate. Many therapeutic modalities have been Proposed without consensus.[3, 4, 5, 6, 7,8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20] Osteosynthesis is often precarious because of the small Size of fragments and poor resistance of porous bone. These mechanical obstacles are increased by the risk of avascular necrosis.[10, 22, 12, 23] That is why some surgeons[5, 24, 25, 27] recommend the use of the humeral prosthesis. Others[8, 28, 29, 30, 31, 26, 32, 33] were disappointed by the modest functional results of prosthetic replacement and the tendency.[34, 35, 36, 9, 10, 11, 37] The discussion of the best treatment is obscured by the fact that Conventional osteosynthesis methods do not allow an anatomical reduction of the complex fractures of the elderly, nor a stable fixation of the fragments to allow an early mobilization. In this study, we have developed an implant called "Bilboquet" that allows for an early reduction of all fractures and stabilizes them.[38, 39]

OBSERVATION

We report the case of a 51-year-old patient who was admitted to the emergency room of the hospital delafontaine (paris) for pain and total functional impotence of the left shoulder occurred during a fall of the stairs, The clinical examination finds deformity of the left shoulder stump with a brachiothoracic bruise. The vasculo-nervous examination is normal.

The standard radiograph of the left shoulder and face showed a fracture at 4 fragments of the upper end of the left humerus (Figure 1). To be completed by a CT scan of the shoulder (Figure 2) The patient benefited from Bilboquet implant osteosynthesis (Ffigure3), The postoperative immobilization is elbow to the body by a bandage type Dujarier.Rehabilitation according to the principles of Neer[44], is started between the 3rd and 8th day is extended until the 6th month.

FIGURE

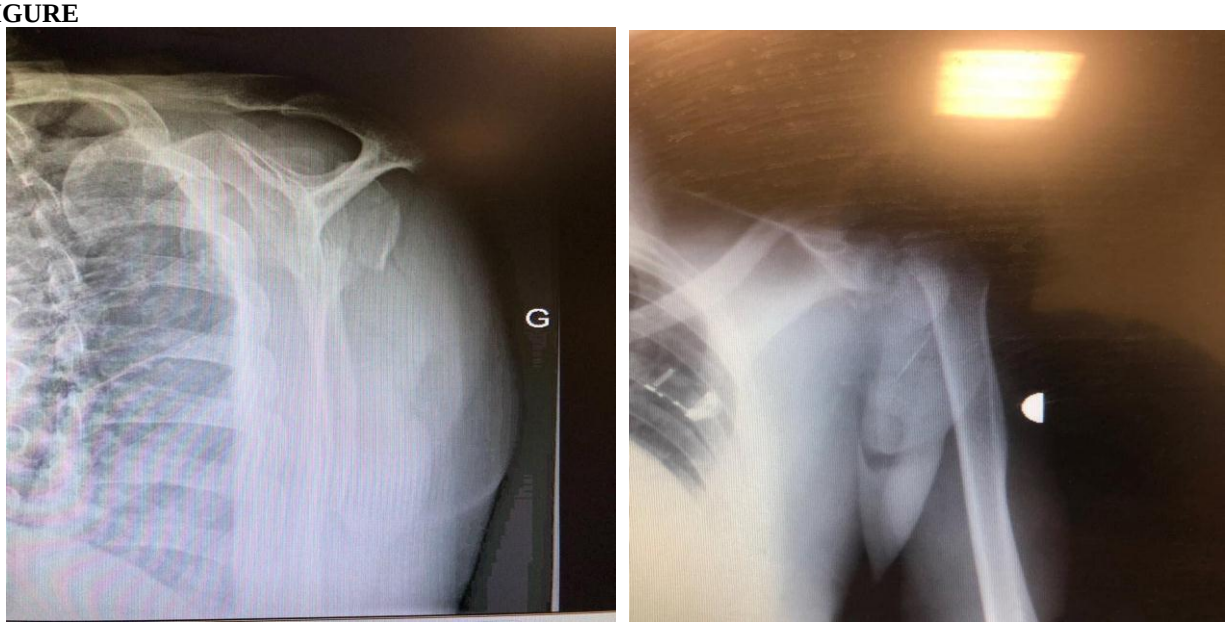

Figure 1: X-ray of the shoulder: comminuted fracture of the upper extremity of the humerus.

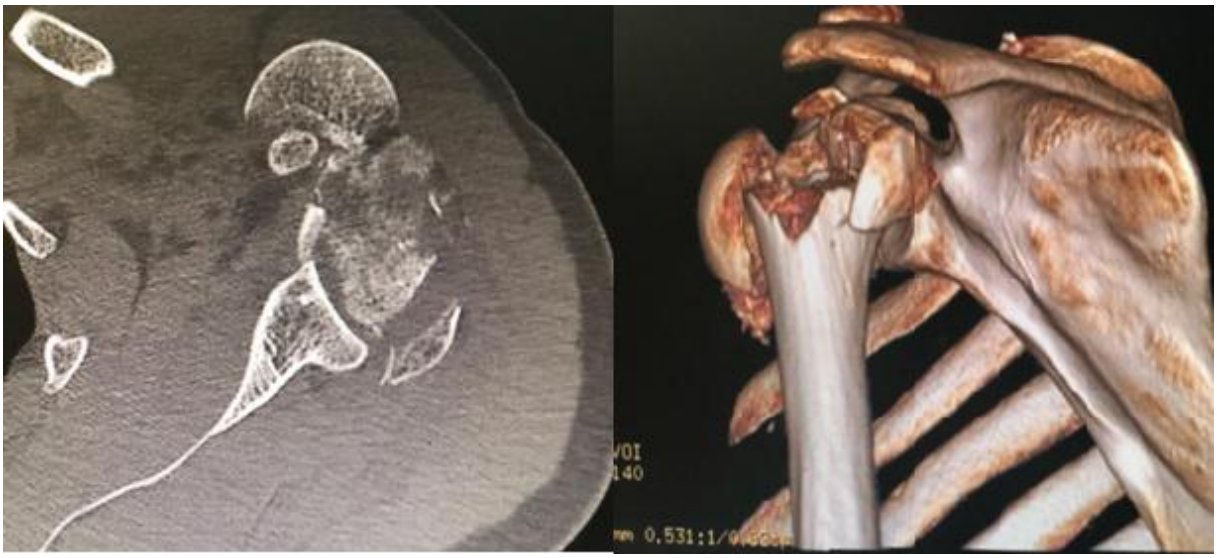

Figure 2: shoulder scanner.

Figure 3: bilboquet implant.

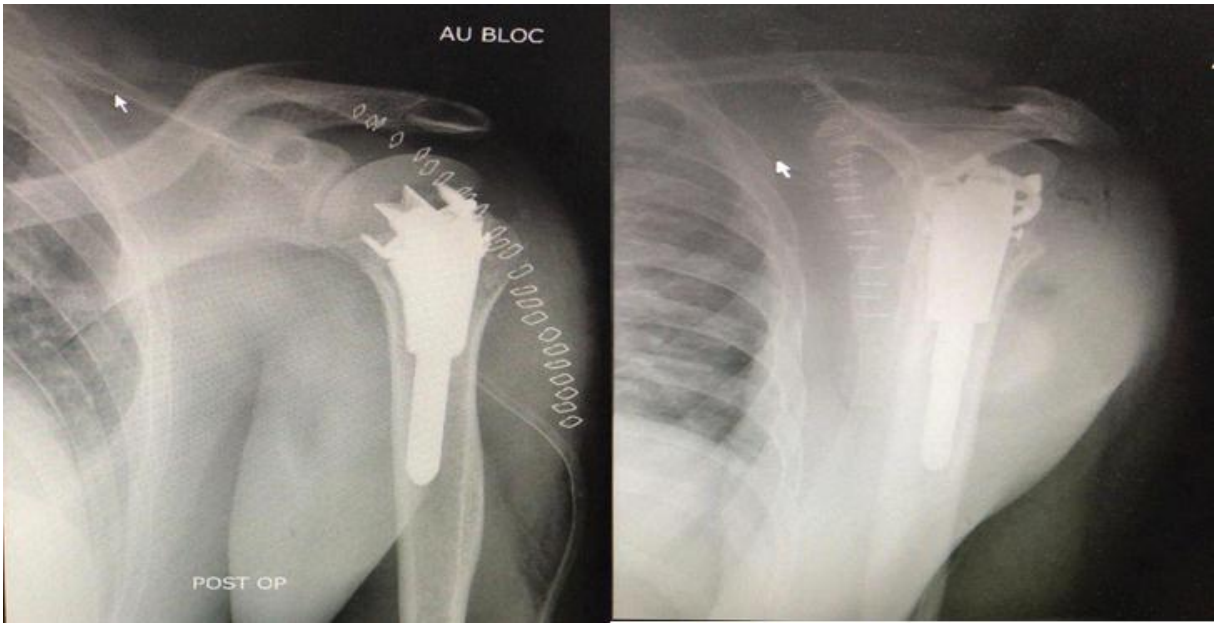

Figure 4: osteosynthesis by implant bilboquet.

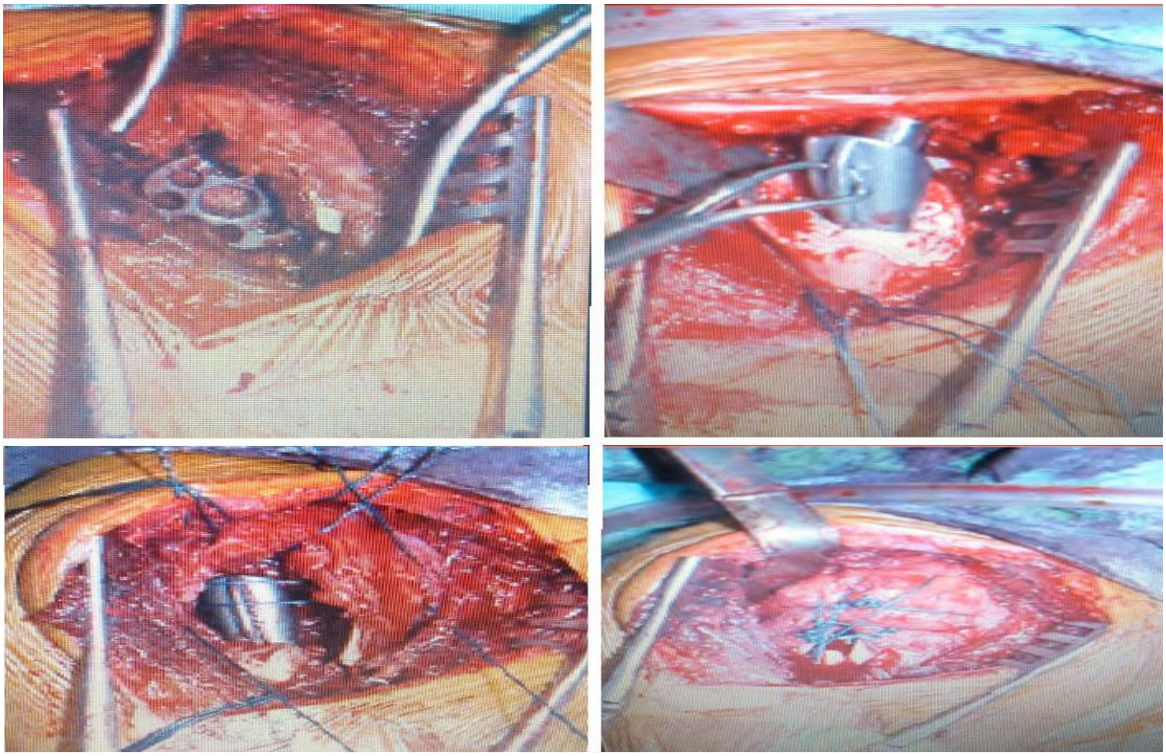

Figure 5: different operative time.

DISCUSSION

The implant

The name Bilboquet is a tribute to the ancient technique of Janick-Gosset which consisted in investigating the fractured head by the humeral diaphysis.[48] Our implant consists of two pieces of titanium (Fig. 4). The cephalic or female part is original. It has the shape of a crown with 5 peripheral teeth and a central hollow cone. This metal crown is intended to be impacted in the cancellous bone of the humeral head and its central hollow cone is intended to receive the Morse taper of the humeral piece.

The humeral or diaphyseal part consists of a stem intended to be sealed in the diaphysis surmounted by a collar 135 ° inclined on the stem and ending with a walrus cone. When the two pieces are fixed in place, the introduction of the Morse taper of the diaphyseal part in the female cone of the cephalic crown performs the osteosynthesis of the epiphysis with the diaphysis. The assembly is completed by fixing the tuberosities according to a conventional lacing. The Morse taper of the humeral stem is likely to couple with a prosthetic humeral head.

The operative technique

The patient is placed in a semi-sitting position. The approach was deltopectoral.

The general principle is to work within the fracture site to minimize the surgical trauma of the surrounding soft tissues. The intervention takes place schematically in four stages (Figure 5)

1. Exposure of the focus and preparation of the humeral diaphysis
2. Placement of the cephalic staple
3. Preparation of tuberosity fragments
4. The synthesis

As regards the indications of this implant, Ledû and Fa¬vard[2] showed the risk of cephalic necrosis increased according to the severity of the initial fracture, as well as with the advanced age of the patients. This is for us an essential element. Use of a cup in a CT4[5] comminuted fracture in an 80-year-old osteoporotic subject is an indication error. A Bilboquet is a mode of osteosynthesis, and as such, it can in no case be used, except in exceptional cases, when the prognosis of vascular perfusion of the humeral head is good. That is to say, ideally when one has the association of a medial fracture line at the level of the surgical collar, a metaphyseal spur greater than 8 mm, and an internal metaphyseal hinge at best preserved.[6] The mechanical qualities of the clip in the cancellous head compared to screws, or pins, should not grow indications of osteosynthesis where a prosthesis would be necessary. This is not because the risk of cephalic necrosis over time is reflected by an easy conversion into hemiarthroplasty (removal of the staple, introduction of an adapted cup), that must be taken. risk of a second intervention in an elderly subject, often fragile, whereas an inverted arthroplasty would have solved the problem in a time with relatively predictable functional results. In summary, a subject of more than 70 years, with a CT4 fracture, no indication of Bilboquet In the younger subject presenting a complex fracture, when the decision between anatomical prosthesis and osteosyn-thesis is discussed, the Bilboquet remains a treatment highly¬ interesting, insofar as the rate of tuberositic consolidation will be greater than in a hemi¬arthroplasty from the outset, and that the management of the eventual cephalic necrosis will be more easily than with a sys More conventional osteosynthesis (nail, plate, pins...), and on solid tuberosities. It should be remembered that conventional osteosynthesis series on CT3-CT4 show cephalic necrosis rates of 15-33%[43, 44, 45], and that pseudarthrosis or malposition of tuberosity on hemiarthroplasty for fractu¬res, range from 15 to 50% in most series.[43] The ideal indi¬cation of a Bilboquet is, for us, a fracture 4 fragments, whose head is impacted (engrained) valgus, with an osteoperiosteal hinge still present on the trochin to ensure a high probability of infusion cephalic. On this type of fracture, any well done osteosynthesis would give a good result. But a bil¬boquet well realized will give, by a limited super-external route, a holding in the humeral head, incomparable.

Early conservative rehabilitation is possible if the tuberosity syn¬thesis is stable. We systematically use loop son dedicated to this type of osteosynthesis, ensuring as much as possible to preserve cephalic vascularization.

CONCLUSION

The Bilboquet implant effectively addresses the mechanical challenge of the FCESH by providing a stable fixation and constant consolidation of tuberosities. But the risk of avascular necrosis of the humeral head that complicates all osteosynthesis modalities is not diminished

Consent

The patient has given their informed consent for the case to be published.

Competing interests

The authors declare no competing interest.

Authors' contributions

All authors have read and agreed to the final version of this manuscript and have equally contributed to its content and to the management of the manuscript

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