

Proximal humerus fracture treated by hemiarthroplasty with uncemented locking stem: multicenter prospective evaluation with a minimum FU of 2 years
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Cemented stem remain the gold standard for prosthesis in trauma

We report the first serie of an uncemented stem fixed by locking screw to evaluate clinical and radiological results of a new implant (Humelock, FX-Solutions®)

A study on 22 cadaveric shoulders & a prospective multicentric clinical evaluation on 21 cases have been conducted to evaluate the use of new tools : placement of a locked stem at right height (pectoralis major), massive horse shoe graft in a metaphyseal frame & strong looped osteosuture of tuberosities.

Evaluation by QDash and Constant score were correlated with positioning of the tuberosities using radiographic examinations & CT scan.

21 patients (18 cases of 4 part) mean age 67,8yo (50-90) have been operated by 5 senior surgeons in 4 centers and reviewed with a mean follow up of 51 months (24-96). At highest follow up Abduction reached 95° (60-160), flexion : 108° (70-160), ER1: 34(0-55). QD reached: 33 (4,5- 59), Constant score: 53 (27-75) and with ponderation: 75 (31,5-109). In 2 cases with post operative non reduction of tuberosities shoulder was stiff (abduction and Flexion < 70°) with great tuberosity non union. Complications have been described in 6 cases : Capsultis (2 cases), cuff problem (2 cases), per operative fracture (1case) problem with locking without reoperation (1 case). The series from Sofcot, Boileau, and Reuther yielded results of 40 to 66% malposition or non union of the tuberosities. Our results are encouraging and demonstrate that using a locking stem and a variable volume metaphyseal frame with massive autograft to fix tuberosities with control of the height of the implant is reliable.

Hemiarthroplasty for 4 part fracture : How to improve results ?

new technique of tuberosities osteosuture - multicenter prospective evaluation

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Tuberosity healing is strongly correlated with functional results in all series of three- and four-part fractures of the proximal humerus treated by hemiarthroplasty.

An anatomic study on 22 cadaveric shoulders & a prospective multicentric clinical study of 49 cases have been conducted to evaluate the use of new tools : placement of a locked stem at right height (pectoralis major), massive horse shoe graft in a metaphyseal frame & strong looped osteosuture of tuberosities. Evaluation by QDash and Constant score were correlated with positioning of the tuberosities using radiographic examinations & CT scan

49 patients (% of 4 part : 82%) mean age 67yo (50-90) have been operated by 9 senior surgeons in 6 centers and reviewed with a minimum follow up of 12 months (mean : 18 ;12-96). At highest follow up Abduction reached 95° (160-160), flexion : 104° (70-160), ER1: 25(0-55). QD reached 30,2 (4,5-68,1), Constant score : 50,8 (27-88) and with ponderation : 72,3 (31,5-120). In all cases (7 cases) with post operative non reduction of tuberosities shoulder was stiff (abduction and Flexion < 70°). Capsulitis (4 cases), infection (2 cases), problem with locking without reoperation (3 cases) and 10% of secondary displacement were pointed.

The series from Sofcot, Boileau, and Reuther yielded results of 40 to 66% malposition or non union of the tuberosities. The initial clinical results from our series are encouraging and demonstrate that using a variable volume metaphyseal frame to fix tuberosities with control of the height of the implant is reliable.

Prosthesis for proximal humerus fracture without cement : Multicenter prospective continue study of a locked stem
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POSTER SECEC

Cemented stem remain the gold standard for prosthesis in trauma

We report the first serie of locked stem of implant in trauma (hemi and reverse)

93 3 & 4 part fracture have been treated by locked stem, 49 with hemiarthroplasty (mean age 67yo (50-90)) and 44 with reversed (mean age : 76,8 (59-90)).

The length of the stem was 15 cm with a proximal coating of HA automatic locking system (2 screws) and 4 different diameter. Preliminary cadaver study allowed us to validate the system (22 shoulders, no injuries of nerves, locking system efficient).

In the group of hemi Constant score with ponderation reached 72,3 (31,5-120) and QDash 30,2 (4,5-68,1) with a mean FU of 26 months.

In the group of reversed Constant score with ponderation reached 79 (36,4-109,4) and QDash 36,5 (2,27-70,4) with a mean FU of 16 months (12-34).

Specific complications due to locking system reached 3 % but without reoperation.

Other complications were : Capsultis (6%), infection (2%).

In this population of elderly patient, new fall with periprosthetic fracture or infection push the surgeon to remove the stem. At shoulder level removal a cemented stem remain a high demanding procedure with sometimes bad functional results and high level of complications. This serie is the first one of locked stem without significant complications. Locked stem remain a new but logical tool in trauma.

Pectoralis major (PM) tendon as reference to restore humeral length in case of hemiarthroplasty for fracture : CT scan study

POSTER SECEC

Functional results following hemiarthroplasty for fracture are strongly correlated with bone healing of tuberosities and height of the implant. We analysed the distance between the top of the humeral head and the upper part of Pectoralis Major (PM) on 137 shoulder scans so as to carry out a wide ranging study on the measurements reported in anatomical studies.

200 consecutive shoulder CT scans of adult patients without post-traumatic lesions were analysed retrospectively (88 women & 112 men, mean age 49.79 years (18-93). All of the examinations were read by the same multiplane reconstruction technician on a PACS post treatment console. For each of the 200 scans (64 slice CT device, 140KeV, 350mAs, rotation time 1s, slice thickness 1mm, obtaining 64 slices/0.6, pitch 0.8) only 137 were able to show a definitive analysis of the sternal head of the pectoralis major.

Distance between the pectoralis major and the top of the head was 67.6 mm (SD: 9.988mm), between the pectoralis major and the trochiter 57.825 mm (SD: 10.317mm), between the pectoralis major and the change in curvature of the external edge of the humeral neck was 28.701mm (SD: 9.029mm) and the anatomical neck: 34.146mm (SD: 9.697mm).

There was a very significant difference in this distance due to gender: an average of 7.8mm more for the men ($p < 0.001$).

With the reported anatomical studies and this first CTscan analysis the right distance between humeral head and Pectoralis major can be defined as 6 cm but with differences depending on the gender

How to decrease scapula notching ?

Retrospective multicenter study on 90 reversed prosthesis with analyse of gleno metaphyseal angle

POSTER SECEC

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the aim of the retrospective multicenter study was to correlate the functional results with the gleno metaphyseal angle

mat 90 patients have been operated (67 excentric omarthrosis, 5 centered omarthrosis, 7 massive rotator cuff tear, 11 others), by 8 surgeons (3 centers), by delto pectoral approach (71%), and evaluated retrospectively by an indépendant surgeon 3 types of prosthesis have been implanted : (Aequalis-Reversed, Tornier® : humeral neck angle of 155°), BioRSA (humeral neck angle of 155° and a prosthesis with a more vertical angle of 145° (Humelock-Reversed, FX-Solutions®. Analyse of QuickDash score, Constant score and complications have been reported by an independant surgeon.

Results : 76/90 patients have been reviewed with mean FU of 18,4 months. When Gleno metaphyseal angle was between 35° and 45°, QDash (25,6) and Constant scores (CB=59-CP=85,2%) were significantly better. clinical complications reached only 6,25%.Quantity of notch were significantly lower and in the subgroup of 145° prosthesis, FX) (p=0,024) or when the angle was between 35°and 45°.

C The percentage of radiological complications is 50% (80% of notch) in the 32 reported series. Lower is the angle, lower is the risk of notch. In order to decrease the value of the gleno meatphyseal angle, the surgeon can give an inferior tilt but he can play on the humerus part in using a more vertical inclination than the vast majority of the reversed implant on the market.

With this work we demonstrated the value of the angle was significantly correlated with the risk of notch