

**FC-041****Primary malignant bone tumors of the proximal humerus: should we sacrifice the deltoid?**

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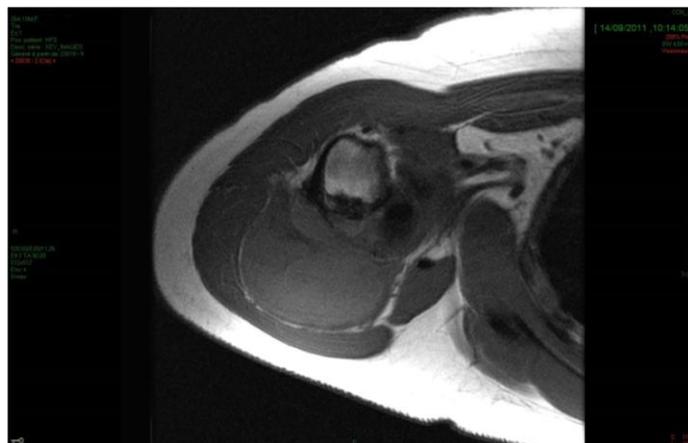
**Introduction:** The proximal humerus is the third most common site for primary bone tumors and conservative treatment is possible in about 90% of patients. However, important structures, such as the deltoid or axillary nerve, may have to be sometimes sacrificed for oncologic reasons.

**Objectives:** The aim of our study was to assess tumor extension relative to anatomical structures, describe the surgical techniques for resection and reconstruction, and evaluate long term oncologic results.

**Methods:** This retrospective study was conducted at a tertiary care centre specialized in the treatment of musculoskeletal tumors. Patients were eligible if they presented with a primary bone tumor of the proximal humerus; had limb salvage surgery and were 15 years and older. Tumor extension on preoperative MRIs or CT scans was assessed by a senior radiologist with 2 years' experience in musculoskeletal radiology. Data on patients, tumors, surgery and follow-up were retrieved from hospital records. The cumulative probability of local recurrence was calculated in a competing risk scenario; the effect of relevant variables on the cause-specific hazard of local recurrence was estimated with Cox regression models.

**Results:** Forty-one patients met the inclusion criteria. The sex ratio was 1.4 M/F and the median age was 35 years (Q1-Q3: 21 - 48). The median follow-up was 62 month (Q1-Q3: 30-141). Chondrosarcomas (42%), osteosarcomas (40%), and Ewing sarcomas (15%) were the most common histologies. 52% of tumors were high grade. Intra-articular contamination of the joint was suspected in 10 (24%) patients; disappearance of the fat sign between the tumor and deltoid was reported in 12 (29%) of patients; and extension of the tumor to the axillary nerve was suspected in 14 (34%) patients. The deltoid and/or axillary nerve was sacrificed in 17 (41%) patients; an extra-articular resection was performed in 2 (5%) patients. A suspension (or equivalent) was performed in 18 (44%) patients; a reverse-shoulder prosthesis in 16 (39%) patients; and an arthrodesis in 7 (17%) patients. All reverse-shoulder prosthesis were allograft composite. A local recurrence was reported for 5 of 41 patients (12%). Factors statistically associated with local recurrence were: intraoperative contamination ( $p = 0.006$ ) and positive margins in pathology ( $p = 0.009$ ). Reverse-shoulder prosthesis were revised (any second operation) in 6/16 cases (38%); arthrodesis in 6/7 cases (86%); and suspensions in 9/18 cases (50%). The main reason for revision was mechanical.

**Conclusions:** Analysis of the local extension of the tumor with regards to critical anatomical structures is paramount preoperatively in order to maximize both local control and function. Tumor-free margins remain the goal to achieve this objective; therefore the deltoid and/or axillary nerve must sometimes be sacrificed.



**Figure 1.** MRI