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Shoulder arthrodesis reconstruction with a pedicled musculo-scapular crest graft after resection for bone tumor

Francois Gouin[1], giovani Padiolleau[2], Guillaume Odri[2], Antoine Hamel[2]

[1)] Hôtel-Dieu, Centre Hospitalier Universit [2)] CHU Nantes, France

Purpose of the study
En-bloc resection of proximal humerus leads to poor functional results when both deltoid muscle or axillary nerve and rotator cuff tendons have to be resected.
When stability and strength is preferred, arthrodesis might be proposed. We report a surgical technique for reconstruction of bone defect and shoulder arthrodesis with an homolateral pedicled musculo-scapular crest graft and its midterm functional results.

Material and methods

Twelve patients underwent shoulder arthrodesis with this technique in order to reconstruct a proximal humerus bone defect. The aetioloies were malignant bone tumor resection for 11 patients (4 extra articular and 7 intra articular resections) and one extensive bone destruction after total shoulder arthrodesis. The mean length of the bony defect was 11.6 cm (6-15), and the graft bridged it in all cases, with an internal fixation by a plate. Function was evaluated according to MusculoSkeletal Tumor Society and Tess scoring system.

Results
5 patients died from the disease 9 to 35 months after surgery. One patient recurred locally 11 months after resection and was amputated. Mean follow-up is 5. 9 year (12 to 144 months). 9 patients healed without any further surgery. Three patients presented a non-union, with a local infection in one case. None of them healed after bone grafting, one patient is still alive with a distal non union. MSTS mean score was 71 % (63 to 80%) and mean Tess score was 70 (50 to 81). All young patients have a professional activity. No patients have sustained a decrease of functional performance after 1 year of follow-up.

Discussion
This pedicled graft associated with internal fixation by plate leads to a similar or better rate of bone healing and functional performance compared to other techniques. Furthermore, it doesn't need microsurgical vascular sutures as when a vascularised fibular graft is chosen. Stability of clinical and radiological results with time is attractive for young patients. The limitation of proximal humerus resection is 15 cm in our experience. The patient must be informed of the poor cosmetic results even when augmentation of the graft by latissimus dorsi muscular flap is done.

E-mail (main author): fgouin@chu-nantes.fr