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Custom-made, anatomical reconstruction of the scapula for Ewing's sarcoma in a 14-year-old patient: case report and review of the literature

J. Friesenbichler, S. Scheipl, L. Holzer, W. Maurer-Ertl, M. Wolf, M. Maier, A. Leithner *Medical University of Graz, Graz, Austria*

Introduction: Ewing's sarcomas are rare primary malignant bone tumours and known to occur at skeletal and extra-skeletal sites. Involvement of the scapula is uncommon. Nevertheless, if Ewing's sarcoma occurs in the scapula, this may indicate total scapulectomy and intra-articular resection of the gleno-humeral joint (= Malawer Type III shoulder girdle resection), which is treatment of choice following preoperative chemotherapy. **Case Report:** Herein we report the case of a 14-year-old male patient suffering from Ewing's sarcoma of the right scapula. The patient was admitted with an osteolytic destruction in May 2013. An open biopsy revealed Ewing's sarcoma, so that neo-adjuvant chemotherapy was started. Staging examinations did not reveal metastases. Chemotherapy was followed by local irradiation. Thereafter, a wide resection of the scapula including the rotator cuff was done. Reconstruction was performed with a custom-made, anatomical, constrained MUTARS scapular prosthesis. Adjuvant chemotherapy started postoperatively. At a follow-up of 13 months, there was no evidence of disease. The functional outcome is good with an abduction range of 40° and a flexion and extension range of 20°, respectively. The patient retained normal hand and elbow function.

Discussion: In the past, custom-made reconstructions were mainly used for malignant bone tumours of the pelvis with a poor outcome. Infection, loosening and mechanical failures were the most common complications. On the other hand, in the literature less is reported about custom-made reconstructions of other anatomical reconstructions. There are two series of Zhang et al. (2009) and Tang et al. (2011) reporting scapular reconstructions for malignant bone tumours. These authors stated that the goal of shoulder reconstructions was to provide a stable and painless joint that allows positioning of the arm and hand in space. Compared to patients left without scapular reconstruction, prosthetic replacement partially restores abduction and external rotation. Chandrasekar et al. (2009) reported the use of an irradiated scapular autograft which also showed a sufficient outcome with a range of motion of 60° for abduction and forward flexion. Although there are limitations in the shoulder's active range of motion, reconstruction with a scapular prosthesis can provide sufficient postoperative function in cases of total scapulectomy.