Reply to Letter to the Editor

Surgical Technique: Unicondylar Osteoallograft Prosthesis Composite in Tumor Limb Salvage Surgery

Hongbin Fan MD, Zheng Guo MD, PhD,
Zhen Wang MD, Jing Li MD, Xiangdong Li MD

Received: 13 March 2013 / Accepted: 27 March 2013 / Published online: 4 April 2013
© The Association of Bone and Joint Surgeons® 2013

We read the letter from Nottrott et al. with great interest, and we very much appreciate their comments.

In our study [1], we highlighted that the indications for this technique were: (1) unicondylar osteoarticular defects after tumor resection with a safe margin, and (2) young active patients with a long life expectancy. Implantation of unicondylar osteoarticular allograft (UOA) was reported to have high radiographic and functional scores [6]. However, progressive degenerative changes (joint narrowing and subchondral bone collapse) in the graft compartment were seen in many patients (39%), especially in young, active ones. We used unicondylar osteoarticular prosthesis composites (UOPC) for reconstruction to try to reduce the incidence of degeneration. According to radiographic evaluation, all joint spaces were unchanged. No moderate or severe degenerative changes were observed in three patients with more than 5 years followup. We stated our study had inadequate power to evaluate UOPC

reconstruction thoroughly; however, it is an acceptable alternative to reduce joint degeneration.

The local recurrence rate of primary malignant bone tumors was 28% (two of seven cases) in this study, which was higher than that of UOA reconstruction [6]. The discrepancy might have been a result of the heterogeneous nature of the tumor cases, small patient number, and patient selection. One patient with recurrent Ewing sarcoma did not receive radiotherapy because of financial difficulties. Another patient with recurrent osteosarcoma had a large soft tissue invasion. These factors may contribute to high local recurrence rate. Therefore, careful patient selection is important. We discussed this in our article.

Computer-assisted tumor surgery is a reliable technique for osteotomy with wide margins. We performed computer-assisted surgery in six patients with juxtaarticular osteosarcoma. They were followed up for average of 17.5 months and no local recurrence was observed [5]. The low local recurrence rate of computer-assisted tumor surgery also was reported by Wong and Kumta [8].

The patient with recurrent Ewing sarcoma had a small incision scar over the lateral condyle and showed positive response to neoadjuvant chemotherapy. His preoperative radiographs, CT scans, bone scintigraphy, and MR images were integrated in the navigation system. Basing on image fusion, we could perform precise tumor resection with a safe margin. The pathologic analysis of the removed tissue showed negative margins, which proved the feasibility of this procedure. Good chemotherapeutic response is critical in determining the suitability of a limited resection for high-grade sarcomas. We agree with Nottrott et al. that adjuvant radiotherapy is necessary after removal of Ewing sarcoma, especially for a recurrent tumor.

The treated chondrosarcoma was Grade III. Although extensive intralesional curettage followed by local adjuvant

(Re: Fan H, Guo Z, Wang Z, Li J, Li X. Surgical technique: unicondylar osteoallograft prosthesis composite in tumor limb salvage surgery. *Clin Orthop Relat Res*. 2012;470:3577–3586.)

The author certifies that he, or a member of his or her immediate family, has no commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc) that might pose a conflict of interest in connection with the submitted article.

All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research* editors and board members are on file with the publication and can be viewed on request.

H. Fan, Z. Guo (✉), Z. Wang, J. Li, X. Li
Department of Orthopedic Oncology, Xi-Jing Hospital,
The Fourth Military Medical University, Xi'an 710032, China
e-mail: guozheng@fmmu.edu.cn

H. Fan
e-mail: fanhb75@yahoo.com.cn

treatment has promising long-term clinical results and satisfactory local control in low-grade chondrosarcoma, en bloc excision is the preferred surgical treatment for intermediate- and high-grade chondrosarcomas [2, 4].

Between 1957 and 1992, 92 patients with giant cell tumors (GCT) were treated in our department with curettage, 50% aqueous zinc chloride solution, and bone grafting. Eighty-six (93%) achieved good or excellent function [9]. For Campanacci Stage II tumors, curettage and cementation or bone graft is the preferred treatment. For Stage III tumors, en bloc resection is selected when pathologic fracture destroyed the integrity of joint surface [3]. The study which Nottrott et al. cited did not involve the patient with a distal femoral GCT with pathologic fractures [7]. The CT scans of the patient, shown in Fig. 5 in our article, and other patients with GCT in our study indicated that pathologic fractures involved subchondral bone and articular surface. Therefore, the resection margins were at least marginal.

References

1. Fan H, Guo Z, Wang Z, Li J, Li X. Surgical technique: unicondylar osteoallograft prosthesis composite in tumor limb salvage surgery. *Clin Orthop Relat Res.* 2012;470:3577–3586.
2. Fiorenza F, Abudu A, Grimer RJ, Carter SR, Tillman RM, Ayoub K, Mangham DC, Davies AM. Risk factors for survival and local control in chondrosarcoma of bone. *J Bone Joint Surg Br.* 2002;84:93–99.
3. Gitelis S, Mallin BA, Piasecki P, Turner F. Intralesional excision compared with en bloc resection for giant-cell tumors of bone. *J Bone Joint Surg Am.* 1993;75:1648–1655.
4. Leerapun T, Hugate RR, Inwards CY, Scully SP, Sim FH. Surgical management of conventional grade I chondrosarcoma of long bones. *Clin Orthop Relat Res.* 2007;463:166–172.
5. Li J, Wang Z, Guo Z, Chen GJ, Yang M, Pei GX. Irregular osteotomy in limb salvage for juxta-articular osteosarcoma under computer-assisted navigation. *J Surg Oncol.* 2012;106:411–416.
6. Muscolo DL, Ayerza MA, Aponte-Tinao LA, Abalo E, Farfalli G. Unicondylar osteoarticular allografts of the knee. *J Bone Joint Surg Am.* 2007;89:2137–2142.
7. von Vult Steyern F, Bauer HC, Trovik C, Kivioja A, Bergh P, HolmbergJørgensen P, Follerås G, Rydholm A. Scandinavian Sarcoma Group. Treatment of local recurrences of giant cell tumour in long bones after curettage and cementing: a Scandinavian Sarcoma Group study. *J Bone Joint Surg Br.* 2006;88:531–535.
8. Wong KC, Kumta SM. Computer-assisted tumor surgery in malignant bone tumors. *Clin Orthop Relat Res.* 2013;471:750–761.
9. Zhen W, Yaotian H, Songjian L, Ge L, Qingliang W. Giant-cell tumour of bone: the long-term results of treatment by curettage and bone graft. *J Bone Joint Surg Br.* 2004;86:212–216.