

Resuming adjuvant chemotherapy after one-stage revision for the infected knee megaprosthesis

Tomoya Matsunobu, Katsumi Harimaya, Yoshihiro Matsumoto, Yukihide Iwamoto
Fukuoka, JAPAN

Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka, 812-8582, Japan

Objective: Periprosthetic joint infection (PJI) during chemotherapy for bone and soft tissue sarcoma is a devastating and complicated problem. Previously, we reported one-stage revision surgery of total knee arthroplasty with intraarticular high-dose antibiotic infusion for PJI without implant removal. In this report, we present 3 osteosarcoma cases in which acute PJI during anti-cancer chemotherapy were successfully treated by the one-stage revision method, and the remaining chemotherapy was completed.

Procedure of the one-stage revision: Indication for the one-stage revision is no radiographical and intraoperative findings of implant loosening. All exchangeable components of HMRS except the anchorage components (i.e. intramedullary stem) were removed. Subsequently, the soft tissues were thoroughly débrided, and irrigation with pulsatile lavage was performed. The removed metallic prostheses were resterilized and reimplanted; and a new polyethylene insert was implanted. Hickman® catheter, a central venous catheter, was inserted into joint cavity. The next day after surgery, intraarticular high-dose antibiotic infusion started.

Material and Methods: From Feb. 2002 to Oct. 2014, 3 cases developed PJI in the middle of anti-osteosarcoma chemotherapy. Causative organisms, period of injection, antibiotics, days between the revision surgery to resume of chemotherapy, chemotherapeutic regimen were retrospectively examined.

Case No.	Age (years)	Sex	Primary site	Causative organisms	Period of injection	Antibiotics (mg/days)	Days between the revision surgery to resume of chemotherapy	Chemotherapeutic regimen (courses)
1	12	M	Distal femur	MRSA	14 days	AMK (400)	88 days	MTX (3), IF0 (3), AP (1)
2	17	M	Proximal tibia	<i>Serratia marcescens</i>	20 days	GM (40)	32 days	MTX (4), IF0 (1), GDDP (1)
3	14	M	Proximal tibia	<i>Staph. species</i> (CNS)	10 days	AMK (400)	94 days	ICE (4)

Case 1: A 12-year-old boy had undergone surgical removal of osteosarcoma reconstructed with HMRS in distal femur in 2012. After 2 courses of adjuvant chemotherapy, he developed a prosthetic infection caused by MRSA. Eighty-eight days after the one-stage revision surgery, 3 courses of high-dose methotrexate, 3 courses of ifosfamide, and 1 course of the combination of doxorubicin and cisplatin were completed without recurrence of infection.

Case 2: A 17-year-old boy had undergone surgical removal of osteosarcoma reconstructed with HMRS in proximal tibia in 2009. After 2 courses of adjuvant chemotherapy, he developed a prosthetic infection caused by *Serratia marcescens*. Thirty-two days after the revision surgery, 4 course of high-dose methotrexate, 1 courses of ifosfamide, and 1 course of cisplatin were completed without recurrence of infection.

Case 3: A 14-year-old boy had undergone surgical removal of osteosarcoma reconstructed with HMRS in proximal tibia in 2007. Metastatic tumor to lung was diagnosed 2 years after the primary resection. After pathological diagnosis of resected lung tumor as metastatic osteosarcoma, adjuvant chemotherapy was performed. After 2 courses of adjuvant chemotherapy, he developed a prosthetic infection caused by staphylococcus species (CNS). Ninety-four days after the revision surgery, 4 course of ICE regimen (ifosfamide, carboplatin, etoposide) were completed without recurrence of infection.

Discussion: PJI during chemotherapy often causes delay in treatment schedule or cancellation of the remaining courses of chemotherapy. In this report, the chemotherapy was completed without recurrence of the infection. We believe that one-stage revision of megaprosthesis with intraarticular high-dose antibiotic infusion may be effective for treating PJI even during anti-cancer chemotherapy.