

Short and Intermediate Term Function After Distraction Osteogenesis for Bone Reconstruction in the Upper and Lower Extremity

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What was the question?

Is distraction osteogenesis safe and effective for the early and late reconstruction of bone defects in the upper and lower extremity during concomitant delivery of chemotherapy? What is the short- and midterm functional outcome in oncology patients treated with DO? What is the rate of complications with this technique?

How did you answer the question?

We evaluated 44 patients who underwent DO reconstruction of the upper and lower extremity between 08/2014 and 03/2018. Indications were primary and revision reconstructions for osseous malignant neoplasms, including secondary discrepancy or deformity. The method of DO included single and double level bone transport via internal or external fixation. 31 (70%) patients completed treatment with DO using an external fixator, 12 (30%) using an internal device. Adjuvant and neoadjuvant chemotherapy, radiation dose and timing, total defect size, and complications were reviewed for all eligible patients. Functional and emotional outcomes were assessed using the MSTS score.

What are the results?

In 40 (91%) cases, the defect was in the lower extremity (femur= 25 cases, tibia= 15 cases). All surgical margins were free of tumor. 41 (93%) patients underwent reconstruction because of primary neoplasms involving bone and 3 (7%) patients because of bone metastases. The median total defect size in tumor patients was 14.25 cm (range 9–25 cm). 17 (39%) patients received chemotherapy prior to DO, 15 (34%) patients before and after the reconstruction surgery; 4 (9%) patients received radiation therapy before surgery. The rate of major complications was 23 (52%). Median follow-up time was 18.22 months (range 0.1–39.75). Median MSTS score at the last follow-up visit was 19 (range 6–30). 16 (36%) patients needed revision surgery. Patients with MSTS score >15 had less revision surgeries; however, there is no significant relationship between revision surgery and MSTS score (p 0.739).

What is your conclusion?

We postulate that the use of DO is safe for the primary and secondary reconstruction of malignant bone neoplasms. It is also an effective technique to regenerate bone during systemic chemotherapy. Despite high complication rate, DO is an effective method for reconstructing even large bony defects and yields good functional results.