

28th Annual Meeting of the European Musculo-Skeletal Oncology Society 16th EMSOS Nurse and Allied Professions Group Meeting

April 29th - May Ist 2015 Athens, Greece



PP-006

Clinical outcome of endoprosthetic reconstruction for the treatment of bone metastases

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Introduction: Bone metastases are associated with a poor prognosis and predispose to a pathological fracture. Surgical treatment is generally palliative, aimed to relieve pain and provide stability. Resection and endoprosthetic reconstruction present a better outcome than internal fixation. However, the main selection criterion for these patients is a relatively long expected survival, when the benefits of a durable and stable implant outweigh surgical risks, rehabilitation time, and high costs. For that reason, patients receiving an endoprosthesis frequently have a solitary metastasis, one of the factors associated with a long survival. Other indications for an endoprosthesis include large bone defects, previously failed surgery, and intra-articular invasion.

Objectives: To evaluate the clinical outcome with endoprosthetic reconstruction for the treatment of long bone metastases over a 15-year period and with special emphasis on the cost-effectiveness and re-intervention in relation to patient survival.

Methods: A retrospective analysis of 25 patients with 26 endoprostheses, 13 cemented and 4 hybrid (MUTARS[®]) placed between 1999 and 2014 was performed. Eight of these were MUTARS[®]-FILIA Femur endoprostheses. Parameters concerning patient and tumour characteristics, and surgical, functional and oncological outcomes were analysed. The Kaplan-Meier method was employed to calculate survival rates.

Results: The distribution of indications for endoprosthetic reconstruction was: 17 (65%) solitary bone metastasis, 13 (50%) actual pathological fractures, 8 (31%) impending pathological fractures, and 8 (31%) endoprosthetic reconstructions were performed after failed previous surgery. The most common localisations were the proximal and distal femur (together 69%), followed by the proximal humerus (19%). Patients were discharged after a median of 8 days (range 3-46). Complications occurred in 11 cases (42%) of which 5 (45%) were Henderson type 4, infection failures (1 acute, 2 sub-acute and 1 late infection). These were treated with suppressive therapy (2 patients), removal of the implant (1 patient) or amputation (2 patients). Seven patients (27%) required revision for any complication. The functional improvement achieved immediately after surgery is durable till last follow-up. Overall, 17 patients died of disease progression, 3 patients had local recurrence and 6 patients were still alive at the moment of analysis. Median postoperative survival was 18 months (range 3-79). **Discussion:** Resection and endoprosthetic reconstruction allows for local disease control, and immediate and sustainable functional stability. Functional outcomes, although differing between joints, are generally good. The relatively long postoperative survival in this series shows that indications are generally set well and that patients have the time to benefit from their endoprosthetic reconstruction. Additionally quality of life scores are necessary to evaluate more accurate the cost-effectiveness and quality of life in these patients. Keywords: Bone metastases; Endoprostheses; Pathological fracture; Local recurrence; Survival.