

## Update on use of expandable prostheses in limb salvage surgery for children's bone sarcomas of lower limb

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**Introduction:** *New techniques in the care of children with malignant bone sarcomas have contributed to the prolonged duration of survival. Attempts to improve the quality of life have become a priority, leading us to improve the techniques of limb sparing reconstructive surgery. Growing children, especially those under 10 years of age have until recently fared better with an amputation than with a limb saving reconstruction because of the unavoidable limb length discrepancy. We used expandable prostheses after Sneath, and later on after Lewis. The present report is a review of our 12-year experience with tibial and femoral prostheses and our successive models., the last two grow without open surgery.*

**Methods:** *Prostheses are made of titanium, which has been chosen for its better mechanical properties, being twice as elastic and light as stainless steel. The prosthesis is manufactured following the recommendations of the surgeon, with individualised size for each patient. The size of the epiphyseal part is small enough to be used in patients from 5 years of age on, and its smooth edges minimize the soft tissue damage. There is no limit to the extendibility of the prosthesis; can be more than 15 cms, even for resection of 10 cms.*

**Patients:** *From 1984 to 1996, we used 32 growing prostheses for children aged 4.5 - 17 years: 5 tibial growing prostheses, 3 superior femoral prostheses, 5 total femur replacements, and 19 inferior femur prostheses. The patients had Ewing's sarcoma (8), osteosarcomas (23) or other (1).*

**Results:** *Five patients died from the disease. Prosthesis was extended in 28 patients. The mean lengthening was 6 cm (min. 2 mm, max. 120 mm). The function of the limb was much improved by lengthening. Following EMSOS criteria, functional results on the last examination are rated as follows: excellent or very good (18), fair (9), bad (5). Two patients suffered of aseptic loosening and 4 of infection following open surgery to increase the limb, requiring removal of the prosthesis to treat the infection. One of those patients had a subsequent amputation. Three had a new growing prosthesis.*

**Conclusions:** *The expandable prosthesis provides an excellent alternative to amputation in young children. Nevertheless, the infection risk associated with multiple surgical procedures in the 1st generation of growing prostheses, challenges us to develop new generations of growing prostheses which do not need open surgery for lengthening.*

**Key words:** children; bone sarcomas; prosthesis; function of the limb

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