

**PP-030****Lower limb lengthening with intra-medullary nail for hypometry secondary to sarcoma resection. Preliminary experience at the Rizzoli Institute**

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**Introduction:** Skeletal reconstruction after resection of bone tumors in the lower extremity of children remains a difficult challenge. Equal limb length at maturity and good functional outcome are the main goals of these surgeries but are difficult to be achieved. Expandable prostheses may require repeated operative interventions, and induce a progressive loss of patients' bone stock in the affected limb. On the other hand biological reconstructions with various type of bone grafts may preserve and replace the bone stock but leave unsolved the issue of the longitudinal growth. The Authors report their preliminary results with a not-invasive lengthening nail in patients with femoral shortening due to previous femoral reconstruction for bone tumors during childhood

**Methods:** PRECICE (Ellipse-Technologies, Irvine, California) is a magnetic intramedullary nail usable for non invasive lengthening of the femur and tibia. Core technology includes an internal magnet, a gear box and a lead screw that turns when activated by a hand held external remote controller. Lengthening procedures are self-performed by the patient three times a day. From February 2014 to January 2015 the nail was implanted in 4 cases: three patients were skeletally mature and had a mean length discrepancy of 4.6 cm (4.2 to 5.2 cm) after resection of a femoral bone sarcoma; two of them were treated with a retrograde, one with an anterograd nail.

In one 6 years old girl the nail was implanted to stabilize an hemiarthicular composite device where the polyethylene platform of an unconstrained tibial component of total knee prosthesis was cemented on a proximal tibial allograft: the patient was affected by osteosarcoma in the proximal two thirds of the tibia, and we used this original reconstruction trying to allow a late lengthening of the tibia sparing the distal femur and the tibial bone stock.

**Results:** The mean lengthening was 4.4 cm (4.2 to 5 cm). The time to full weight-bearing was 2 months after the end of lengthening. The consolidation index was 1.7 (0.75-1.62) months/cm. Complete consolidation was obtained in all cases. Running back was not observed in any case.

**Conclusions:** Limb length discrepancy is a frequent complication of surgical treatment for bone sarcomas in children. These patients need repeated surgeries during their childhood and in the adult life. The Precice lengthening nail allows to lengthen up to 8 cm, with non-invasive lengthening procedures, and is a highly promising aid to recover lower limb length discrepancy after biological reconstructions in children with bone tumors.