Editorial

JOURNAL OF CHILDREN'S ORTHOPAEDICS

Malignant bone tumours in children: What's up?

Cristina Alves

Cite this article: Alves C. Malignant bone tumours in children: What's up?. *J Child Orthop* 2021;15:310-311. DOI: 10.1302/1863-2548.15.210123

Keywords: Malignant; bone tumours; paediatric

The Covid-19 pandemic forced EPOS to move the 39th EPOS Annual Meeting from the colourful streets of Porto and the Douro riverbanks to the screens and microphones of the e-world. Suddenly, EPOS had to travel to each home and adapt to new realities, including social distancing, changing communication and education dynamics. Our resilience and ability to believe defeated impossibility and gave place to an outstanding EPOS 2021 Virtual Meeting, which started on 14th April 2021 with an exceptional Pre-meeting Course on 'Malignant Bone Tumours in Children: What's Up?'. We were fortunate to gather internationally renowned experts, who offered us a scientific immersion on this topic and united efforts to publish seven collaborative articles in this *Journal of Children's Orthopaedics*' Special Issue, sharing their knowledge, clinical experience and research.

Paediatric malignant bone tumours are very rare, and it is well known that multidisciplinary coordinated teamwork is essential to provide the best possible outcome to a child with this condition. While significant improvements in survival have been seen in several paediatric malignancies, the prognosis for paediatric osteosarcoma and Ewing sarcoma has remained unchanged for the past 3 decades.[1]

When a doubtful lesion is observed in a child's bone, it is crucial to make a correct diagnosis, in a referral and experienced centre, with expertise in paediatric musculoskeletal oncology. Salom *et al* provide us with important information regarding the diagnosis and staging of malignant bone tumours in children, highlighting the importance of a good clinical history and physical examination, along with appropriate imaging techniques, laboratory tests, biopsy and histopathology.[2]

Department of Pediatric Orthopaedics - Hospital Pediátrico - CHUC, EPE, Coimbra, Portugal.

Correspondence should be sent to Cristina Alves, MD MSc FEBOT, Department of Pediatric Orthopaedics – Hospital Pediátrico – CHUC, EPE Avenida Afonso Romão, 3000-602 Coimbra, Portugal.
E-mail: cristina.alves@me.com

Hecker-Nolting *et al* emphasize how interdisciplinary collaboration is key to the success of treatment of bone sarcomas. They also clearly state that local therapy, by surgical wide resection of the primary tumour and any primary metastases, remains a prerequisite for cure. However, they explain that surgery alone will not cure the patient and describe why, when and how chemotherapy should be used. Furthermore, these authors also give information on how to deal with recurrent disease and palliative care.[3]

One of the unique and specific challenges of paediatric malignant bone tumours is the preservation of limb growth and prevention of limb length discrepancy. Van der Heijden *et al* describe the best uses of currently available biological and technological options for the surgical treatment of malignant bone tumours in children, with a special focus on the very young. These authors emphasize the importance of preoperative planning to simulate scenarios for tumour resection and limb reconstruction, useful to facilitate decision-making for different surgical and reconstructive techniques in individual patients. They also describe how allograft reconstruction offers bone stock preservation and explain the advantages of using free vascularized fibula graft, when appropriate and feasible. Furthermore, they show that epiphysiolysis before resection, 3D printing, growing endoprosthesis, rotationplasty and amputation are options to be considered in the personalized treatment of each individual patient.[4]

Axial bone tumours are difficult to diagnose. Time interval between the onset of symptoms and the diagnosis in a pelvic or spinal location is usually significantly delayed and the prognosis is worst, with a 5-year survival rate of 50%.[1] Helenius and Krieg deliver an overview on spinal and pelvic malignant bone tumours in children, describing possible management strategies and reconstruction options, concluding that a timely adequate multi-disciplinary management is essential to improve survival and quality of life in these patients. [5]

Most osteosarcomas and Ewing sarcomas that occur during the growth period, affect the lower limb. Different localizations and age groups require diverse surgical approaches and solutions. Wirth *et al* guide us through the reconstructive paths for malignant bone tumours of the lower limb in paediatric patients and show that tumour dimension, location, age and prognosis of the patient, safety of the procedure, functional demands, and individual choices of patient and parents are all key factors to consider when selecting the most suitable local therapy. Life and limb salvage are the most important treatment goals, followed by functional and cosmetic considerations.[6]

When treating sarcomas of the upper limb, the surgical team is challenged to balance sufficient resection margins while providing reliable and durable reconstruction. Hopyan reminds us that the relatively small volume of host tissue makes resection and reconstruction arguably more challenging in children with upper limb malignant bone tumours.[7] Erol and Sofulu enlighten us regarding tricks and pitfalls in the surgical treatment of malignant bone tumours of the forearm in children and adolescents.[8] Both Hopyan and Erol agree that due to the complex anatomical structures of the upper limb, resection with wide margins is a challenge for orthopaedic oncologists, but essential for patient survival. When planning reconstruction in the context of upper limb sarcoma surgery, preservation or restoration of hand function is key, if possible. It also seems appealing to combine biological skeletal reconstruction with tendon transfers and nerve grafting or transfers, which may provide profound long-term benefits.[7,8]

I am confident that this Special Issue will be useful to all paediatric orthopaedic surgeons and all other healthcare professionals involved in the care of children with malignant bone tumours. I would like to thank Editors-in-Chief Fritz Hefti and Shlomo Wientroub for entrusting me with the great honour and privilege of being the Guest Editor for this *Journal of Children's Orthopaedics* Special Issue. I express my gratitude to Thomas Wirth, recent Past EPOS President, whose vision and leadership inspired us, at EPOS, to dream more, learn more, do more and become more. Also, I must acknowledge the work of Inês Balacó and Marta Salom, Co-Chairs of the EPOS Musculoskeletal Tumours, Infections & Arthritis Group, for having organized an exceptional pre-meeting course with world experts in paediatric musculoskeletal oncology. Finally, I am thankful to all the authors for their contributions and willingness to collaborate and share their knowledge, passion and dedication to the mission of increasing the quality of care for children with malignant bone tumours.

COMPLIANCE WITH ETHICAL STANDARDS

OA LICENCE TEXT

ICMJE CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest related to this work.

REFERENCES

1. Jackson TM, Bittman M, Granowetter L. Paediatric malignant bone tumours: a review and update on current challenges, and emerging drug targets. *Curr Probl Pediatr Adolesc Health Care* 2016;46:213-228.

2. Salom M, Chiari C, Gómez-Alessandri J, Willegger M, Windhager R, Sanpera I. Diagnosis and staging of malignant bone tumours in children: what is due and what is new? *J Child Orthop* 2021;15:312-321.

3. Hecker-Nolting S, Maia Ferreira A, Bielack SS. Bone sarcoma – success through interdisciplinary collaboration. *J Child Orthop* 2021;15:331-336.

4. Van der Heijden L, Farfalli GL, Balacó I, Alves C, Salom M, Lamo-Espinosa JM, San Julian M, van de Sande MAJ. Biology and technology in the surgical treatment of malignant bone tumours in children and adolescents, with a special note on the very young. *J Child Orthop* 2021;15:322-330.

5. Helenius I, Krieg A. Reconstruction of spinal and pelvic malignant bone tumours in children. *J Child Orthop* 2021;15:337-345.

6. Wirth T, Manfrini M, Mascard E. Lower limb reconstruction for malignant bone tumours in children. *J Child Orthop* 2021;15:346-357.

7. Hopyan S. Reconstruction for bone tumours of the shoulder and humerus in children and adolescents. *J Child Orthop* 2021;15:358-365.

8. Erol B, Sofulu O. Tricks and pitfalls in the surgical treatment of malignant bone tumours of the upper limb in children and adolescents. *J Child Orthop* 2021;15:366-371.