Pediatric Chronic Osteomyelitis: An Introduction

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Chronic osteomyelitis in children can be a devastating disease as it may lead to major bone loss, bony deformities, partial or complete growth plate arrest, nonunion, and significant limb length discrepancy. Function can be severely affected, and on a worldwide scale, it remains one of the most crippling and devastating musculoskeletal conditions. The key to prevention of chronic osteomyelitis remains proper management of the infection during the acute phase. Any sick child with bony tenderness should be suspected as having acute osteomyelitis until proven otherwise, and antibiotics should be started immediately after appropriate cultures are obtained. If there is no clinical and laboratory response within 24–48 h, then either the causative organisms are not sensitive to the given antibiotics or a subperiosteal abscess has developed, and this has to be addressed.

Basic principles in the management of these chronic conditions remain intravenous therapy (ideally after identification of the causative organisms), radical and thorough **debridement of all necrotic soft and bony tissues** (may often need to be repeated), use of local antibiotic beads, provision of soft tissue coverage, and ultimately reconstruction of the bony defect.

Immobilization of the leg with an **external fixator** and ensuring soft tissue coverage – while treating the infection – remains the standard approach during the acute stage until the infection is eradicated. Then, the various sequelae are addressed. In general, small defects of up to 1–2 cm could be treated by acute shortening, defects of 3–4 cm by compression/distraction, while larger defects may be addressed with either bone transport or the Masquelet technique.

In cases of large segmental defects with other associated deformities, a **bone transport** is usually indicated as this approach could simultaneously address all the associated problems as well as the bone defect (as shown in case 118). Another major advantage of the bone transport technique (with cable, wires, or half pins, as discussed in the section ▶ Pediatric Trauma: An Introduction) includes the almost unlimited amount of newly formed bone that could be generated and the fact that this new bone is well vascularized with the same micro/macrostructure as native bone.

In cases of isolated bone loss (as in case 117), the induced biomembrane technique described by **Masquelet** is an alternative viable option. The exact role of each of these techniques in the management of isolated critical size defects remains unclear at the moment and needs to be further defined. Other cases of bone and joint infections not discussed in this section include cases of septic destruction of the proximal femur in the section ▶ Pediatric Hip Deformities: An Introduction (treated with pelvic support osteotomy) and two cases of septic destruction of the epiphysis in the pediatric section ▶ Growth Plate Injuries: An Introduction.

1 Cross-References

- ▶ Case 117: Chronic Osteomyelitis and 5 cm Bone Defect Treated with Masquelet Technique Followed by Ilizarov
- ▶ Case 118: Trifocal Distraction Osteogenesis in the Management of Sequelae of Chronic Osteomyelitis of the Tibia (Pseudarthrosis, Deformity and LLD)

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