



## **SIMULTANEOUS SURGICAL TREATMENT OF MULTIPLE LOWER EXTREMITY DEFORMITIES IN CHILDREN WITH OSTEOGENESIS IMPERFECTA**

**Paul W Esposito, MD; Kimberly Turman, MD, Susan Scherl, MD, Horacio Plotkin MD, Bridget Burke PA-C, (University of Nebraska Medical Center, Omaha, NE)**

**PURPOSE:** To demonstrate that the multiple percutaneous osteotomy technique allows for the safe treatment of deformities and fractures of multiple lower extremity long bones simultaneously. This technique minimizes the number of surgical experiences and hospitalizations for these children. Early medical treatment with bisphosphonates coupled with early surgical treatment optimizes the development and comfort of these children. This study will demonstrate that the percutaneous technique minimizes injury to the soft tissue, allows for early weightbearing and decreased immobilization compared to previous techniques.

**METHODS:** A retrospective review of a consecutive group of 19 patients with osteogenesis imperfecta who underwent a total of 33 femoral, and 20 tibial realignments. All of the femurs were treated with Fassier Duval Telescoping rods. The tibiae were fixed with intramedullary k-wires, rush rods or Fassier Duval telescoping tibial rods, depending on the age and size the child.

**RESULTS:** There were 13 females and 6 males. The average age at the index operation was 29.7 months. Age ranged from 18 to 80 months. Average follow-up was 16 months. 16 of the patients underwent simultaneous treatment of 2 or more lower extremity long bones, with 5 of the patients under going treatment of both femurs and both tibiae on the same day. Average blood loss was 85cc per patient. Two patients early in the series were treated with hip spica casts, and two with prefabricated HKAFO early in in the series. The remaining patients were treated with posterior splints until they were comfortable, ranging from 3 days to 4 weeks. All patients were allowed to weight bear as tolerated when comfortable. Three patients required revision surgery in the post operative period.

**CONCLUSION:** In children appropriately treated with bisphosphonates, the percutaneous technique of multiple osteotomies, with intramedullary fixation can be safely performed. This minimizes the number of hospitalizations and surgeries these children require, while optimizing their comfort and abilities. From one to 4 lower extremity long bones can be treated simultaneously with appropriate patient selection by a team experienced in the care of these children.

**SIGNIFICANCE:** This paper demonstrates that children with severe forms of OI can have multiple severely deformed lower extremity bones treated safely and effectively at one setting. The prolonged immobilization and extensive soft tissue trauma associated with other types of operative treatment is not necessary, and can cause worsening osteoporosis, weakness and joint stiffness not seen in the present study.