BENT TELESCOPIC RODS IN OSTEOGENESIS IMPERFECTA PATIENTS

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Purpose: To characterize implant bending as a mode of failure in telescopic rods used in the treatment of Osteogenesis Imperfecta (OI)

Methods: IRB approval was obtained for a retrospective review of OI patients treated at our institution. Patients with bent telescopic rods were included and contralateral unbent rods were examined for comparison.

Results: 6 males and 6 females were identified. Average age at surgery was 3.6 years. Average interval between surgery and bending was 4.0 years (range 0.9-8.2). 51 telescoping rods were implanted: 43 Fassier-Duval (FD), 8 Bailey-Dubow (BD). Overall 35% (18/51) bent, 11 in the femur and 7 in the tibia; 13 FD, 5 BD.

Of the FD rods, 32 were implanted in the femur and 11 in the tibia. In the femur, bent FD rods ranged from 3.2 to 6.4 mm in diameter, and unbent FD rods ranged from 3.2 to 6.0 mm. In the tibia, bent FD rods ranged from 3.2 to 4.0 mm, and unbent FD rods ranged from 3.2 to 4.8 mm. There was no statistically significant difference in the mean size between the bent and unbent implants.

Of the 8 BD rods, 4 were implanted in the femur and 4 in the tibia. In the femur, all four rods were 5/32, and 1 of them bent. The BD rod size was not recorded for the tibial implants, but all 4 rods bent.

6 rods bent at the junction of the smaller and larger rod, 8 bent over the larger rod, and 6 bent over the smaller rod. 3 rods bent in two areas.

10 of the 18 bent rods presented with an acute fracture. 8 of the rods bent slowly over time as the underlying bone bowed. At the time the bent rods were identified as bent, 1 had cut out proximally and 3 distally, 1 had disengaged proximally and 7 distally.

Conclusion: While telescopic rod pull out or cut through has been described, the bending of these implants has not been well characterized. Rod bending can present acutely with a fracture or progress in a chronic fashion. In revision of the bent rod, we recommend using the largest diameter to prevent bending; however, this may lead to stress shielding. More research is necessary to determine the best rod size for the treatment of OI.

Significance: This study emphasizes the importance of bending as a mode of failure of telescopic rods.