

Treatment of Distal Radial Fractures in the Elderly with the Photodynamic Bone Stabilization System

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Purpose: Our purpose was to evaluate the clinical outcomes of osteoporotic distal radial fractures in the elderly treated with a photodynamic bone stabilization system.

Methods: A total of 73 patients were included in this study. They were treated with the photodynamic bone stabilization system polymeric implant. All patients underwent a dual-energy x-ray absorptiometry (DXA) scan to evaluate the bone density. The photodynamic bone stabilization system intramedullary balloon implant is introduced through a 1-cm incision and positioned in the intramedullary canal across the fracture through a percutaneous technique. The balloon is filled with a light curable monomer, expanding to achieve cortical wall contact and then exposed to visible blue light (436 nm), polymerizing the monomer and forming a patient customized implant. The median age was 79 years (range, 66- 91 years); 95% were female. Patients were eligible for inclusion if they met the following criteria: age 60 years or older, bone density T-score <-2.0 , and AO type 23-A2 or 23-A3 fracture. All patients were treated in day care. Patients were discharged with a low-pressure stocking for 24 hours, followed by a double bandage for 1 or 2 weeks. There were no mobility restrictions. They went to physiotherapy and used their wrist as tolerated.

Results: Functional abilities: 60% (44/73) were able to resume normal activities of daily living (ADLs) within 1 week and 85% (62/73) within 2 weeks of surgery. Four of the 73 patients (5%) suffered a complication: superficial skin infection (n = 2) and postoperative complex regional pain syndrome (n = 2). Postoperative pain related to the use of the system was reported in 1 patient. Irritation of the extensor pollicis longus tendon in this patient was resolved by resecting 4 mm of the introducing catheter, which had been left a bit prominent. Five patients showed a collapse of the distal radius up to 4 mm. This, however, did not limit the overall function, range of motion, or ADLs. There were no secondary procedures or delayed unions. Visual analog scale scores for pain had a median of 0. All had an unrestricted range of motion within 3 months of the procedure.

Conclusion: The photodynamic bone stabilization system has been shown to be a viable treatment method for fixation of distal radial fractures in osteoporotic elderly patients. The ability to fully fill the trabecular space in percutaneous manner results in excellent stabilization of the distal radial fracture and a rapid return to full ADLs, important in the elderly population and a reduction in the cost of Medicare.