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Minimally invasive photodynamic bone stabilization system (IlluminOss®) for treatment of pathological fractures in the upper extremity

S. Sachsenmaier, T. Kluba
Orthopaedie Uniklinik Tuebingen, Tuebingen, Germany

Background: The number of pathologic fractures increases with prolonged survival time in cancer patients. Tumor patients with bone metastases often are in a reduced physical condition, are on immunosuppression medication and suffer from chronic pain. Stabilization of pathologic fractures is necessary to reduce pain and restore mobilisation. Simple and less invasive methods should be used to avoid additional treatment morbidity. The aim of our examination was to evaluate the functional outcome after osteosynthesis of pathologic fractures in the upper extremity with the IlluminOss® system.
Materials and Methods: The IlluminOss® system is based on traditional balloon catheter technology. The balloon is inflated by a biocompatible monomer that hardens through the application of visible light. The analysis included 6 patients with pathological fractures of the humerus, radius or clavicle who were surgically stabilized with the IlluminOss® intramedullary implant. The individual function was measured with the "Toronto Extremity Salvage Score" (TESS) and the "Musculoskeletal Tumor Society Rating Scale" (MSTS) pre- and postoperatively. Pain situation was evaluated with "Numeric Rating Scale" (NRS). All data were analyzed anonymously with SPSS.
Results: The mean age of the included patients was 76 years. Most of the patients (67%) were in a moderate condition despite numerous bony metastases. The mean NRS was 6.8 preoperatively. We observed a reduction in the postoperative course (NRS 1.5 at follow-up). The values for clinical function of the upper extremity improved postoperatively for both tests (TESS pre-op: mean=37, TESS post-op: mean= 68, MSTS pre-op: mean= 9, MSTS post-op: mean= 20). The mean duration of the procedure was 71 min.
Conclusions: The minimal invasive access, improvement of function after osteosynthesis and the reduction of pain postoperatively justified the use of the IlluminOss® system in the included patients.