

Angle stable intramedullar polymer for rapid stabilization of pathological fractures

Introduction

In the palliative setting patients with pathological fractures are demanding for a fast stabilization of the fractured limb providing immediate pain relief, early onset of mobilization and simplify nursing care that leads to improvement of quality of life.

Material and methods

The method used integrates the properties of light cured (photodynamic) plastics, used successfully for decades in dentistry, filled into Dacron (PET) balloon catheters that have been used in interventional radiology and cardiology. Through a small incision in Seldinger-technique a balloon catheter is inserted into the marrow cavity which has been previously expanded with use of a flexible cannulated drill. The balloon is filled with liquid plastic monomer, and using a system of visible blue light at a wavelength of 436 nm, is converted into a hard polymer in 400 to 500 seconds. The sole function of the balloon is to keep the fluid monomer in place during the curing process. In all cases closed reduction was performed. Finally a locking screw was inserted proximal and distal in an angle stable fashion. Average operation time was 41 minutes (33 to 51).

Results

So far three patients - two females and one male at an average age of 68,6 years - were treated suffering from a pathological fracture of the upper limb. In two patients the humeral shaft was broken. One of these patients suffered from breast cancer, the other from prostate cancer. The basic disease of the third patient with an unstable fracture of the radial and ulnar shaft was also breast cancer. With the presented implant a stable situation could be achieved. Postoperative physiotherapy started on the first postoperative day.

Conclusion

The patient customized implant is characterized by its high restoring force and its excellent rotational stability. The lack of X-ray-density provides full assessment of the entire bone. Stability is increased by locking with angle stable screws, placed at any angle, at any reasonable place anatomically.