

Evidence-Based Benefits of Minimally Invasive Percutaneous Radiofrequency Ablation, Balloon Osteoplasty, Cement Reinforcement, and Internal Fixation Reconstruction of Periacetabular Osteolytic Metastases: Clinical Outcomes and Technical Details

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Periacetabular osteolytic metastases with impending or established pathologic fractures have been managed with a heavy emphasis on metal implants that are used for trauma, arthroplasty, or sarcoma surgery. Radiofrequency ablation, balloon osteoplasty, reinforcement with zoledronate-loaded polymethyl methacrylate bone cement, and internal fixation is a first-line minimally invasive percutaneous ambulatory procedure addressing four major dimensions of local cancer control, bone biology, biomechanical stability, and time factors. The main advantage of radiofrequency ablation, balloon osteoplasty, cement reinforcement, and internal fixation is to avoid extensive open surgical approaches for mega-implants for the management of periacetabular bone defects in patients with often-unpredictable remaining life.

Recently published studies by the author of this video and other investigators consistently show improved pain and functional outcomes. In addition, increased bone mass at the site of the procedure is observed in surviving patients. Technical details of the procedure include indications/contraindications, patient positioning, draping, imaging technique, guidewire insertion, insertion of cannulated screws as a universal portal for catheters, biopsy, radiofrequency ablation, balloon osteoplasty, cement delivery, advancement of cannulated screws through curing bone cement, and immediate weight bearing as tolerated. All technical details are presented in the video.

In summary, radiofrequency ablation, balloon osteoplasty, cement reinforcement, and internal fixation is an effective, minimally invasive endoskeletal reconstruction method that represents a first-line alternative for the reconstruction of periacetabular metastatic bone defects, with emphasis on local cancer control, local bone homeostasis improvement, biomechanical stability, and time-related bone mass improvement in patients with a survival of less than 1 year or more than 1 year.