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Radiofrequency (RF) Kyphoplasty in Comparison to (VP) Vertebroplasty - Clinical and Radiological Results - A Three Months Prospective Evaluation

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Background: Radiofrequency Kyphoplasty (RFK) provides a new minimally invasive procedure to treat vertebral compression fractures (VCF). The purpose of our study was to investigate the functional outcomes, safety and radiographic outcomes after the treatment of painful osteoporotic vertebral fractures treated with RF Kyphoplasty. The BKP and VP groups served as control groups.
Purpose: To prospectively assess the efficacy and safety of RFK in comparison to VP in treating thoracic and lumbar spinal osteoporotic fractures that result in pain or instability.
Materials and methods: Sixty patients (39 females and 21 males, mean age 68) with 92 osteoporotic vertebral compression fractures (VCF) were treated with RFK using the StabiliT Vertebral Augmentation System (DFine Inc. San Jose, CA). The StabiliT System provides a navigational osteotome to create a site and size specific cavity prior to delivering an ultrahigh viscosity cement with an extended working time (done by applying radiofrequency energy to the cement immediately prior to entering the patient). Three months follow up in 52 patients (33 females and 19 males) with 80 treated VCFs are reported. Thirty nine patients (28 females and 11 males, mean age 66 years) underwent 52 VP procedures. Three months follow up in 28 patients (22 females and 6 males) with 38 vertebrae treated are reported. Patient-related outcomes of pain (Visual Analogue Scale) and disability (Oswestry Disability Index) were assessed pre- and postoperatively and after 3 months. Correction of vertebral height and kyphotic deformity were assessed by radiographic measurements. Cement leakage was evaluated by CT scan postoperatively.
Results: Mean pain visual analogue scale and Oswestry Disability Index significantly improved in both patients groups from pre- to post-treatment ($P < 0.0001$), this improvement being sustained up to 3 months follow up. A gain in height restoration and a reduction of the post-operative kyphotic angle were seen post-operatively and at 3-months in the RF Kyphoplasty group. Cement leakage was noted in of 5.4% of the RFK porcedures and 59.6% of the VP procedures.
No symptomatic cement leaks or serious adverse events were seen in the RFK group during 3-months of follow up. Two patients in the VP group had a lung embolism due to a cement leakage, both of which were treated conservatively.
Conclusion: RF Kyphoplasty and vertebroplasty are two minimally invasive procedures that provide immediate pain relief and improved functional ability in patients with osteoporotic VCFs. Both procedures are able to stabilize the fracture in the three months follow-up. Site specific cavity creation and delivery of ultra-high viscosity cement in RF Kyphoplasty resulted in the added benefits of height restoration and lower cement leakages intra-operatively.