



## VERTEBRAL AUGMENTATION PROCEDURE –PERCUTANEOUS VERTEBROPLASTY

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### ABSTRACT

A study of 52 patients with single level vertebral fractures for cement augmentation procedures (vertebroplasty) by unilateral transpedicular approach in our institution over a period of four years (2015-2018). We compared visual analogue scoring and Roland Morris disability scoring between pre operative and post operative day 10, one month and six months period to assess the efficacy of the pain relief. Among 52 patients, 10 patients has not come for follow up. Among 42 patients, 39 patients had improvement in visual analogue and Roland Morris scoring system (Daily life living and pain relief). 3 patients have not shown significant improvement in pain relief and underwent spinal stabilisation.

### KEYWORDS :

#### INTRODUCTION:

It is a percutaneous cementing technique aims to reinforce vertebral compression fractures. Injection of acrylic cement - polymethyl methacrylate (PMMA) into the vertebral body through a cannula is the characteristic of this technique. Aim is to prevent vertebral body collapse and significant reduction of pain in pathologic vertebral body fractures.

#### MATERIALS & METHODS:

In our hospital we performed vertebroplasty in 52 patients over a period of 4 years (2015 -2018) We included patients in whom single level vertebroplasty was performed. All patients underwent unilateral approach. The one and foremost indication was pain. Patients were offered both conservative and vertebroplasty as the treatment options. Patients in the conservative group were given an option of bed rest for 2 weeks for pain to resolve. If the pain persisted after 2 weeks, advised for vertebroplasty.

The procedure is performed under general anaesthesia. The patient is placed in prone position. Under C-arm guidance we identified the pathologic vertebral level. Using vertebroplasty needle pedicle is identified. The entry point and trajectory to avoid nerve root and visceral structures are confirmed by C-arm. The needle is safely guided into the body through the pedicle by biplanar fluoroscopy.

Once the needle is in optimal position, the acrylic cement is injected into the body. On an average 1.5 to 3 ml of cement used for a case. Injection is stopped whenever there is spread into epidural or paravertebral space or when the cement reaches the dorsal part of vertebral body.

#### INCLUSION CRITERIA:

- Osteoporotic fractures & traumatic vertebral compression fractures
- Elderly where the risk of prolonged bed rest is high.
- Complex fractures with intact posterior wall of the vertebral body.
- Progressive collapse of vertebral body during follow-up in a conservatively managed patient.
- Multiple vertebral fractures within a short time period in an elderly.
- Painful fracture of a vertebral body, refractory to conservative treatment, in a patient where the cause of pain remains unexplained.
- Vertebral compression fractures associated with metastatic lesions, paget's and myeloma

#### EXCLUSION CRITERIA

- Fracture needing (open) surgical stabilization with screws and rods (complex fracture with more than 30% to 40% spinal canal compromise).
- Pain unrelated to the fracture.
- Infection.
- Neurological compromise with cord or nerve compression.
- Fatigue fracture in ankylosed spines.
- General contraindications to surgery (e.g. clotting disorders, cardiac disease).
- Limited visibility during surgery or technical problems.

#### FAILURE OF TREATMENT:

- Patients with same pre op pain and increased pain after the vertebroplasty.
- Cement leak into the canal
- Progressive fracture in stress x rays in spite of no pain or decrease in the pain. Such patients were offered alternative treatment options.
- Cement leak anteriorly/superiorly/inferiorly into the disc space through the fracture lines with no neurological injury is not taken as failed treatment.

#### ADVANTAGES:

- Minimally invasive
- Less duration of surgery
- Early ambulation
- No incidence of orthostatic pneumonia and DVT
- Early discharge

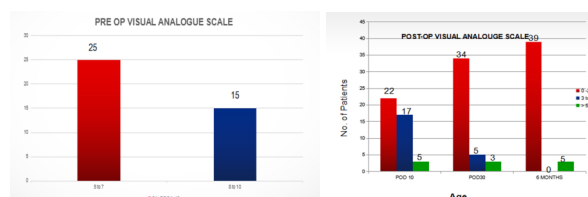
#### COMPLICATIONS:

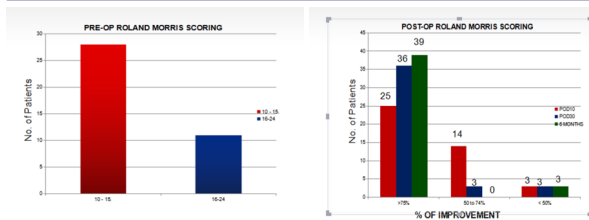
- Cement leak
- Infection
- Allergic reactions to cement

#### STUDY DESIGN:

Prospective study with a sample of 52 patients

#### STATISTICS:





### RESULTS:

Between 2016 to 2018, we operated 52 cases of vertebroplasty. Indications were osteoporotic fractures & traumatic vertebral fractures with less than 50% reduction in body height without canal compromise and without any neurological deficit. Among the 52 patients, 10 patients lost follow-up. We compared pre-operative & post-operative visual analogue pain scale and Roland Morris scoring in the post-operative day 10, 30 & 6 months period. The average volume of cement used was 1.5 to 3 ml.

39 patients (93%) showed improvement in visual analogue scale & Roland Morris score over 6 months period. In 3 patients (7%) pain remains the same and underwent spinal stabilization. One patient had a plaster tail. None of the patients had any serious complications.

The limitations of our study are a small group of patients with a third of the patients lost on follow-up. No control group, the conservative group was not randomized. No proper comparison between unilateral and bilateral approach in the absence of any patients with bilateral vertebroplasty. Being a government hospital with limited resources, the patient was given the best available options for treatment.

### DISCUSSION:

Percutaneous vertebroplasty is a most potential technique for pain management in vertebral fractures. For several decades, vertebroplasty has been performed as an open procedure to augment the purchase of pedicle screw for spinal instrumentation and to fill voids resulting from tumour resection.

The procedure introduces acrylic cement into vertebral bodies to mechanically augment their structural integrity. Percutaneous vertebroplasty achieves the benefits of surgical vertebroplasty without the morbidity associated with open procedure. Vertebral augmentation was accomplished by injecting polymethyl methacrylate (PMMA) cement into a vertebral body via a percutaneously placed cannula.

The procedure was performed in 1984 by Galibert and Deramond in the department of radiology of the university hospital of Amiens, France on a woman aged 54, who had complaints of severe cervical pain for several years. This patient diagnosed to have a large C2 vertebral hemangioma with epidural extension. She underwent C2 laminectomy & excision of tumour followed by injection of cement into C2 body for structural reinforcement. The patient experienced complete pain relief.

### OUTCOME:

The pain and the quality of life improved significantly in these patients. They resumed normal activities earlier than the conservative group. Unilateral approach and single side vertebroplasty had outcomes comparable to the bilateral approach in the literature. There were no post-operative complications in our patient group. One patient had a plaster tail, with no adverse neurological outcome.

### CONCLUSION:

Percutaneous vertebroplasty is an alternative technique for spinal stabilization in patients with vertebral fractures. Proper preoperative assessment of patients will give better outcome in long term. It is a safe and straightforward technique without any serious complications and pain relief is also considerable.

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