

MULTIPLE LEVELS VERTEBROPLASTY: FEASIBILITY, SAFETY AND EFFICACY

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Purpose: Even if vertebroplasty is considered a safe procedure, major complications can occur. Cardiovascular collapse and death have been reported and attributed to cement and/or fatty pulmonary embolism, monomer toxicity, and adverse reactions to local anesthetic and sedation. Higher number of treated levels may increase the potential danger of these factors, consequently vertebroplasty performed at more than 4 levels in one single session is considered potentially dangerous.

A series of n° 330 patients in two Centers treated with vertebroplasty at 5 or more levels is reported to see the feasibility, safety and efficacy of multiple levels vertebroplasty.

Method. Among 1702 treated patients with 5497 vertebroplasties (average 3.2 levels treated per patient in one session) we retrospectively reviewed 330 patients treated with vertebroplasty at 5 or more levels in one session for a total of 2034 vertebrae.

The distribution of patients, levels treated and causative pathologies (severe mainly secondary osteoporosis, myeloma, metastases, osteomalacia) is shown in the table.

The indication for multiple levels treatment was based on the presence of multiple vertebral fractures associated with severe, invalidating and diffuse poorly localizable back pain.

Some prophylactic vertebroplasty such as sandwich vertebra or adjacent vertebrae considered at risk of subsequent fractures were also included in the treatment planning.

All patients were fully monitored during the treatment. All the treatments were performed in local anesthesia. In one center premedication with morphine was used. In the other no analgesic premedication was performed.

The procedure was carried out under fluoroscopy control, using thin needles (13G -15G) and monolateral approach to reduce the dose of local anesthetic, which didn't exceed 30 ml of 1% lidocaine in any case.

Transpedicular access in lumbar vertebrae and parapedicular access in thoracic vertebrae were preferentially used.

<i>Patients</i>	<i>n° treated vertebrae</i>	<i>osteoporosis</i>	<i>myeloma</i>	<i>metastases</i>	<i>osteomalacia</i>	<i>Total Levels</i>
111	5	85	8	18		555
118	6	99	11	8		708
64	7	53	9	2		448
22	8	17	4		1	176
7	9	7				63
5	10	5				50
2	11	2				22
1	12				1	12
330		268	32	28	2	2034

Results. All treatments were well tolerated with no clinical relevant complications.

Any alteration in oxygen saturation and other vital parameters during the procedure were observed. The average time for the procedures was between 45 and 60 minutes. The use of thin monolateral needles (13-15 Gauge) had many advantages.

Needles positioning was less traumatic avoiding skin incision and requiring less dose of local anesthetic. The access into the vertebral body was more rapid and easier, especially in vertebra plana or in vertebrae with thin pedicles.

The average amount of cement injected per level was 1.5-2 cc for thoracic vertebra and 2-3 cc for lumbar vertebra, achieving a full filling of the central portion of the vertebral body. The monolateral approach, with placement of the needle in the anterior midline, was always used.

Mendec Spine resin (196 pts), Spinefix (130 pts) and Cortoss (4 pts) were used.

High viscous cement was easily injectable, with no relevant leakage. All patients had significant reduction of pain (VAS score of 8.2 ± 1.4 significantly dropped to 1.5 ± 1.8 after vertebroplasty $p < .0001$ Wilcoxon rank test). Subsequent fractures were observed in 37 cases (11.2%) and were treated with vertebroplasty.

Conclusion: Multiple levels vertebroplasty performed by an experienced physician with thin needles is feasible, safe and effective. It could be used in prophylactic treatment in patients with severe osteoporosis or myeloma.