





## PATIENT-CENTERED OUTCOMES OF VERTEBROPLASTY VIA QUESTIONNAIRE

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### ABSTRACT

**Purpose:** Our aim was to evaluate patient centred outcomes of patients with compression fractures treated by vertebroplasty.

**Methods:** Patients with compression fractures treated by vertebroplasty procedure between 2013- 2016 was examined with a 3-question through telephone call.

**Results:** Fifty-two patients completed the telephone satisfaction survey. Of these, 92.5 % of answerers said the procedure was acceptable, 86.5% had full or partial pain remission and 78.8 % would have the procedure again.

**Conclusions:** The use of vertebroplasty is supported by randomized trials in osteoporotic and malignant compression fractures. To the results of our study, patients believe vertebroplasty is a tolerable procedure that produces full or partial pain remission and would try the same procedure again if needed.

**Keywords:** Vertebroplasty; kyphoplasty; vertebral fracture; patient satisfaction

**Level of Evidence:** Retrospective clinical study, Level III

### INTRODUCTION

Compressive vertebral fracture is a situation caused by osteoporosis or due to expansion of malignant tumors into the skeleton. Percutaneous vertebroplasty (PVP) has become a widespread technique in the treatment of osteoporotic compression fractures and vertebral metastatic lesions<sup>(1-3)</sup> since it was described for the first time by Galibert et al.<sup>(4)</sup>

Vertebroplasty is a surgery achieving its effect by applying the cement through a needle into the fractured vertebral body, without correction of kyphosis. The main aim of this procedure is to decrease of the back-pain caused by vertebral fracture<sup>(5)</sup>.

Vertebral fractures could affect the patients functionally and could negatively affect mobility outcomes as well as psychosocial outcomes of the patients. Currently, the most important thing for the healthcare reimbursement is higher patient satisfaction<sup>(6-7)</sup>.

Our aim in this study was to evaluate patient-centered outcome measures using specific

questions directed at procedure tolerability, pain relief, and willingness to undergo the same procedure again to show the utility of vertebroplasty not only objectively, but also subjectively from the patients' perspective.

### PATIENTS AND METHODS

All patients who had undergone a vertebroplasty procedure at the year between 2012–2016 were identified. Patients were included in the study if they<sup>(1)</sup> were aged above 50 years, <sup>(2)</sup> had vertebrae or lumbar fracture without symptom and signs of spinal cord damage or pedicle damage, <sup>(3)</sup> had focal back pain without definite radicular signs and symptoms unresponsive to at least 8 weeks of appropriate conservative treatment, <sup>(4)</sup> had back pain related to the location of the OVCF on spinal radiographs, <sup>(5)</sup> Vertebrae compression fracture confirmed by international recognized imaging (X plain film, CT, MRI T2-weightedshort tau inversion recovery sequences) and clinical examination.

Patients were excluded if they <sup>(1)</sup> deceased patients <sup>(2)</sup> had spinal cord compression or stenosis of the vertebral canal >30% of the local canal diameter, <sup>(3)</sup> Injury of neural function including spinal cord damage or cauda equina injury, <sup>(4)</sup> had systemic or local spine infections.

The indication for vertebroplasty was assessed using the medical records as well as pathological information from bone biopsy. They were separated into osteoporotic/spontaneous fractures, fractures related to biopsy-proven malignancy, or traumatic fractures.

### Survey

The included patients were contacted through telephone numbers obtained in the demographic data of their electronic health record. The “Vertebroplasty Telephone Satisfaction Survey”, a simple three-question survey, was administered to the patient. In *Table-1* questions asked by the survey are showed. Only the patients are allowed to take the survey. If the patient was close to communication with the telephone they were excluded from the survey and study. If the patient was unavailable for communication by the telephone, two more attempts were made, for a total of three attempts, before the patient was counted as unreachable and excluded.

**Table-1.** Questionnaire results

Questions results	Number
<b>Q1. Was the procedure to inject cement into your fracture tolerable?</b>	
Yes	47
No	5
<b>Q2. Was the pain in your back relieved by the procedure to inject cement into your fracture?</b>	
Yes	33
Somewhat	12
No	7
<b>Q3. Would you have the same procedure again?</b>	
Yes	40
Not sure	7
No	5

## RESULTS

One hundred and seventeen patients were identified from the hospital health system due to inclusion criterias. Eight patients refused to participate in the questionnaire and were excluded. Fifty seven were unreachable or unable to complete the questionnaire. Fifty two patients remained.

The majority of the patients were females. The age range was from 56–91, with an average age of 72.4. The most common level requiring vertebroplasty was T12, followed by L1 and then L2. Overall, 88.4 % of fractures were at the thoracolumbar junction (T10–L2). (Table-2).

The cause for surgery was mainly osteoporotic or spontaneous fractures, which accounted for 75.0 % of all patients.

Overall, 90.3 % of respondents said the procedure was tolerable. When asked regarding pain relief, 86.5 % of respondents had partial or full pain relief from the procedure, with 63.4 % overall stating “yes” to the pain relief question. When asked whether they would have the procedure again, 76.9 % of respondents stated “yes”. Full survey results are listed in Table-2.

**Table-2.** Patient characteristics

Characteristics	Number
<b>Sex</b>	
Male	9
Female	43
<b>Age</b>	
50–69	39
70–89	12
>90	1
<b>Cause of fracture</b>	
Spontaneous/osteoporotic	39
Malignancy	3
Trauma	7
Unknown	3
<b>Number of levels</b>	
T8	1
T9	2
T10	1
T11	8
T12	21
L1	13
L2	3
L3	1
L4	2

## DISCUSSION

Our study demonstrated that, the treatment of compression fractures with vertebroplasty procedure results in subjective pain relief from the patient perspective. Most patients’

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perspective on vertebroplasty is that given another compression fracture, they would have re-operation in the form of vertebroplasty due to our findings.

This study has several limitations. First there could be recall bias. The patients who had procedures in 2012 were called in 2018, thereby introducing approximately 6 years between time of procedure and questionnaire administration. When breaking down the data to compare years, patients who had the procedure in 2012 had the same overall trend in answer choice. Patients in 2012 responded “somewhat” to pain relief question 2 57.8 %, and “yes” only 36.1 % of the time. This trend was reversed in all following years.

Also the limitation of our study the lack of objective investigation of the pain with ODI and VAS scale, but the main aim of this study was to evaluate patient-centered outcome data.

In conclusion healthcare environment is changing and patient satisfaction is becoming more important. Our patient data has now shown that vertebroplasty is also well-tolerated, effective, and desirable, from the patient perspective.

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## REFERENCES

1. Cotten A, Dewatre F, Cortet B, Assaker R, Leblond D, Duquesnoy B, Chastanet P, Clarisse J. Percutaneous vertebroplasty for osteolytic metastases and myeloma: effects of the percentage of lesion filling and the leakage of methyl methacrylate at clinical follow-up. *Radiology* 1996; 200: 525–530.
2. Deramond H, Depriester C, Galibert P, Le Gars D. Percutaneous vertebroplasty with polymethylmethacrylate. Technique, indications, and results. *Radiol Clin North Am* 1998; 36: 533–546.
3. Martin JB, Jean B, Sugiu K, San Millán Ruíz D, Piotin M, Murphy K, Rüfenacht B, Muster M, Rüfenacht DA. Vertebroplasty: clinical experience and follow-up results. *Bone* 1999; 25(2 suppl.): 11S–15S.
4. Galibert P, Deramond H, Rosat P, Le Gars D. Preliminary note on the treatment of vertebral angioma by percutaneous acrylic vertebroplasty. *Neurochirurgie* 1987; 33: 166–168.
5. Cortet B, Cotten A, Boutry N, Flipo RM, Duquesnoy B, Chastanet P, Delcambre B. Percutaneous vertebroplasty in the treatment of osteoporotic vertebral compression fractures: an open prospective study. *J Rheumatol* 1999; 26: 2222–2228.
6. Silverman SL. The clinical consequences of vertebral compression fracture. *Bone* 1992; 13 (Suppl 2): S27–S31.
7. Lyles KW, Gold DT, Shipp KM, Pieper CF, Martinez S, Mulhausen PL. Association of osteoporotic vertebral compression fractures with impaired functional status. *Am J Med* 1993; 94: 595–601.