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The effects of cement distribution index on refracture of adjacent segments after percutaneous vertebroplasty

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Objective: The objective of this study is to investigate the effects of cement distribution index on refracture of adjacent segments after percutaneous vertebroplasty.

Methods: A retrospective analysis was adopted to complete the research. 143 patients received percutaneous vertebroplasty for osteoporotic vertebral compression fracture from April 2011 to March 2014 were covered in this study. All patients were followed up for 1 year. Cases developed adjacent segment fracture (re-fracture group). The other cases were not observed new fracture (control group). After operations, X-rays were taken from all patients. Index I to V was used to describe the position and shape of cement in vertebrae, and volume-cubage index was computed based on the cement volume and vertebral cubage. Age, gender, bone mineral density, distribution index, volume-cubage index, cement leakage was evaluated in the 2 groups. Then the significant indictors were used to be in variables in Logistic regression analysis.

Results: 134 cases were followed up for 1 year at last. 18 cases (13.4%) developed adjacent vertebral fractures. BMD in re-fracture groups was lower than that of control group ($P<0.05$). While the rates of cement leakage of re-fracture group were higher than that of control group ($P<0.05$). There was significant difference in distribution index between refracture and control groups ($P<0.05$). While the differences in age, gender, cement volume and volume-cubage index were not significant between the 2 groups ($P>0.05$). Bone mineral density, cement leakage and distribution index affected on adjacent fractures by Logistic regression analysis.

Conclusion: Low bone mineral density, cement leakage and poor distribution of cement in vertebrae might be the risk factor affecting adjacent vertebral fracture after percutaneous vertebroplasty.

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