



Vertebroplasty (PVP) is effective in the treatment of painful vertebral hemangiomas

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We assessed the results of percutaneous vertebroplasty treatment of painful vertebral hemangiomas in 110 patients, with a three years follow-up.

110 patients with painful vertebral hemangiomas were treated by percutaneous vertebroplasty. The patients were diagnosed by MRI and observed for 3 years after surgery. Visual Analog Scale was used to assess the level of pain.

Pain significantly diminished in all patients, 90% were free of pain for three years after augmentation. In 10% some pain appeared after 1 year, but less intensive than before surgery. 3 years after vertebroplasty 90% of patients were free of pain. No complications of PVP were observed. In 3 patients extravertebral leakage was noted with no clinical symptoms.

PVP is highly effective in the treatment of painful vertebral hemangiomas. The method is safe, produce minimal complications and eliminates, or highly reduces pain for a long time period.

Keywords : hemangioma ; vertebral column ; pain, vertebroplasty.

INTRODUCTION

Vertebral hemangiomas are common with an incidence of 10% in population (6,12). In most cases they are discovered incidentally and are rarely symptomatic. A number of methods have been used in the treatment of symptomatic and

aggressive vertebral hemangioma, but none of them is optimal. If these lesions are symptomatic they are treated by radiotherapy, arterial embolization, surgical excision (4,15), but in last twenty years vertebroplasty was often used in the treatment of this lesion (2,5,6). This study aims to illustrate the validity of the treatment with cement vertebroplasty in patients with painful vertebral hemangiomas.

PATIENTS AND METHODS

We analyzed the files of 110 patients treated from 2008 to 2012 for pure vertebral hemangiomas. There were 65 females and 45 males, 28 to 56 years of age, mean 39 years. All patients complained of significant pain with no neurological or radicular deficits, and in all of them radiographic studies revealed the presence of hemangioma. All hemangiomas were extensive and covered at least 1/3 of the vertebral volume. In 34 (31%) patients vertebral margin fracture of the affected vertebrae was found, in 29 it was superior vertebral endplate. 64 patients had thoracic vertebral hemangiomas,

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located from Th3 to Th12, the most common was Th7 – 16 patients, and Th12 – 17 patients. 7 lesions were located above Th7 vertebra. 46 lesions were located in lumbar area, the most common L4 - 16 patients, and L5 - 14 patients.

Before augmentation all patients were diagnosed with MR. The patients were treated by percutaneous vertebroplasty /PVP/. Transpedicular unilateral approach under local anesthesia was used. After placement of the needle, acrylic cement (Mendec Spine, Tecres, Italy) was injected under fluoroscopic control. 13G needle was used in all patients. Cement was injected in fraction of 0,3-0,4 ml up to 2,5 – 3,5 ml what in all patients allowed to fill the vertebra. If extravertebral leakage was observed augmentation was immediately terminated.

The level of pain was assessed according to Visual Analog Scale /VAS/. The neurological exam and an assessment of pain were done before surgery, next day after augmentation and then 1 month, 6 months, and 1 and 3 years after augmentation. The next day after surgery CT scan was performed in order to assess the position of cement in the affected vertebra and eventual extravertebral leakage.

RESULTS

Before augmentation all 110 patients suffered of significant pain from 4 up to 8 cm in VAS. Immediately after surgery pain significantly

Table I. — Intensity of pain in VAS before surgery and during three years follow-up in 110 patients

VAS	Before augmentation	1 day after	6 months	1 year	3 years
0-1	0	78	78	70	70
>1 -2	0	32	32	28	28
>2-3	0	0	0	12	12
>3-4	0	0	0	0	0
>4-5	24	0	0	0	0
>5-6	0	0	0	0	0
>6-7	72	0	0	0	0
>7-8	14	0	0	0	0
Total	110	110	110	110	110

diminished in all patients, in 78 disappeared totally, in 32 diminished below 2cm in VAS. The same result was obtained after 6 months. 1 year after surgery 12 (11%) patients reported some chronic back pain which did not exceed 3 cm in VAS, and the same result was noted three years after surgery. These results are summarized in table I.

Extravertebral leakage appeared in 3 patients only, in 2 of them embolization of vertebral veins was also observed. Extravertebral leakage and vertebral vein embolization was noted during surgery and in these patients augmentation was stopped immediately. Leakage was confirmed by postoperative CT. In these 3 patients no clinical complications were observed, and results of treatment were perfect with a total relief of pain.

DISCUSSION

Vertebral hemangiomas are common benign vertebral column tumors with overall incidence of 10-12% in the general population (1,3,4). They are usually discovered incidentally on imaging studies by their characteristic appearance and are usually limited to vertebral body (3,5). Only a small number of these lesions have extravertebral expansion into the spinal canal (1,4,15), and pure extravertebral hemangiomas are extremely rare (14). MRI studies show increased signal intensity on both T1- and T2-weighted images (4,12). In the past, symptomatic vertebral hemangiomas were treated by radiotherapy, selective arterial embolization, or surgical excision and stabilization (1,2,10,11,15). These kinds of treatment have documented serious complications (4,15), and currently transcutaneous vertebral augmentation is a preferred method of therapy of these lesions (5,6,11,12). Percutaneous vertebroplasty /PVP/ occurred to be effective in the treatment of osteoporotic vertebral fractures, both single (8,9) and multiple ones (8,12,13).

Most authors report very good results of treatment of vertebral hemangiomas with PVP (3,4,5,6,11,12). In our series perfect results were achieved in all patients, despite of age, gender and the intensity of pain before surgery. Before augmentation, from 110 patients, extensive pain – with VAS above 5 cm – was noted in almost 80%. After surgery pain

practically disappeared in all patients within 24 hours after therapy. Follow up studies revealed perfect results up to 3 years after augmentation. 10% of patients reported small increase of pain after 1 year but we think, that it was not related to hemangioma and augmentation.

In 31% of patients we found endplate deflections, mainly superior ones. Superior endplate is thinner and less supported by trabecular bone than inferior one (16) Endplate deflection is a defining feature of vertebral fracture (7), what shows that large hemangiomas can lead to fractures and aggravate pain. These patients also benefited from surgery, similar to patients without endplate fractures.

58% of hemangiomas were located in thoracic area. With more cranial location, above Th7 vertebra, the risk of eventual complications is higher than in lower vertebral regions, but with a proper technique and small fraction augmentation it does not produce more complications. We also recommend the use of thin needles – 13G, what makes this procedure more safe.

Extravertebral leakage was observed in 3 patients only, in 2 of them embolization of vertebral veins occurred. Clinical results in these 3 patients were perfect, with a total reduction of pain. In other studies, in hemangiomas (3,6,11,12), as well as in osteoporotic fractures (8,9,12,13), such leakage was observed up to 30% of patients. We think that augmentation made in small fraction of cement and proper location of the needle - in the center of the vertebra allows to avoid this complication.

Conflicts of Interest: No conflicts declared..

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