

PERCUTANEOUS VERTEBROPLASTY: EXPERIENCE WITH THE EXTRAPEDICULAR ROUTE

PERKÜTAN VERTEBROPLASTİ : EKSTRAPEDİKÜLER GİRİŞİM UYGULAMALARI

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SUMMARY:

Percutaneous vertebroplasty is a safe method which has been used in the treatment of osteoporotic vertebral compression fractures and some neoplastic diseases of the spine nearly since 25 years. Although the classical route for percutaneous vertebroplasty is the transpedicular route, extrapedicular route has some peculiar advantages.

A group of patients treated with extrapedicular vertebroplasty is presented in this study. Quantitative measurements of pain the preoperative, postoperative and follow-up periods and cement leakages were evaluated. Extrapedicular route seems to be a useful and safe way to obtain satisfactory results in percutaneous vertebroplasty as an alternative option against classical transpedicular route.

Key words: *Vertebroplasty, osteoporotic spinal fractures, surgical treatment*

Level of Evidence: *Clinic Study, Level III*

ÖZET:

Perkütanöz vertebroplasti yaklaşık 25 yıldır özellikle osteoporotik omurga kompresyon kırıklarında ve omurganın kimi neoplastik hastalıklarında güvenle kullanılan bir yöntemdir. Her ne kadar perkütanöz vertebroplasti için kullanılan klasik yöntem transpediküler teknik olsa da, ekstrapediküler tekniğin bu yönetime göre bazı üstün özellikleri vardır.

Bu çalışmada ekstrapediküler teknikte perkütanöz vertebroplasti uygulanan olgular sunulmaktadır. Olgularda işlem öncesi, sonrası ve takip döneminde ağrı miktarları ve işlem sonrası çimento kaçakları değerlendirilmiştir. Sonuçta ekstrapediküler yöntemin perkütanöz vertebroplasti için transpediküler yönetime alternatif olarak kullanılabilecek, güvenli bir yol olduğu düşünülmüştür.

Anahtar Kelimeler: *Vertebroplasti, osteoporotik omurga kırıkları, cerrahi tedavi*

Kanıt Düzeyi: *Klinik çalışma, Düzey III*

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INTRODUCTION:

Although the classical route for percutaneous vertebroplasty is the transpedicular route, extrapedicular route has some peculiar advantages. In extrapedicular approach, the needle can be angled more toward the center of the corpus than does the transpedicular approach and allows easier filling of the corpus with one injection. In this approach, route of the needle passes along the lateral aspect of the pedicle, rather than through it, so a small pedicle will not be restrictive for cement delivery (Fig.1) ^(1,3,6).

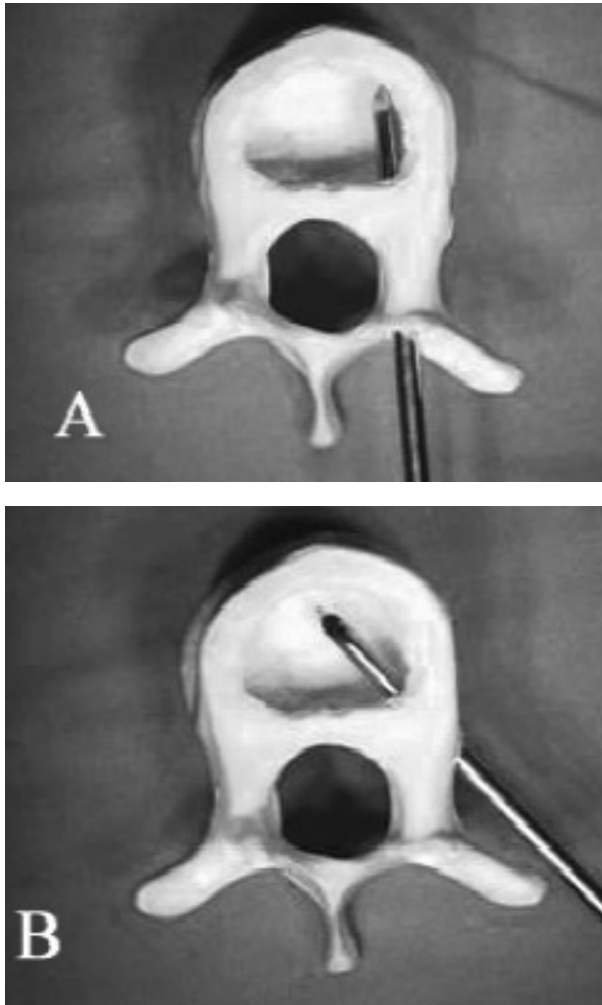


Figure-1. A. Transpedicular route, B. Extrapedicular route

To determine the convenience, safety and efficacy of the treatment of spine fractures with percutaneous vertebroplasty via an extrapedicular route is aimed in this study.

MATERIALS AND METHODS:

A group of 37 patients; 24 women and 13 men, aged 27-93 years (mean 60), having osteoporotic and pathological spine fractures at 49 levels, treated with percutaneous vertebroplasty using PMMA bone cement via an extrapedicular route in our clinic between 2003 and 2007 was investigated. While 30 patients with 39 levels had osteoporotic fractures, 7 patients with 10 levels had pathological fractures. 15 of 39 levels had wedge, 13 levels had crush and 11 levels had biconcave fractures. All of the patients were suffering from disabling back pain refractory to conservative treatment. Quantitative measurements of pain were evaluated in the preoperative, postoperative and first month follow-up periods using visual analogue scale (VAS). No pretreatment venography performed in any patient ^(2,4). All operations performed in prone position, under fluoroscopic guidance and local anaesthesia. Mean amount of PMMA bone cement used was 3.8 ml (2.5-4.2) for each vertebral body. Cement leakages were assessed in postoperative CT scans and classified according to the cement leakage classification of Yeom et al (Fig.2) ⁽⁷⁾.

RESULTS:

All patients were allowed to walk 6 hours postoperatively and discharged next day on foot. Mean VAS scores were found 8.4 (9.6-7.2) preoperatively, 2 (0.6-6.1) at postoperative first day and 1 (2.5-0.2) at postoperative first month follow-up. Cement leakages were determined in

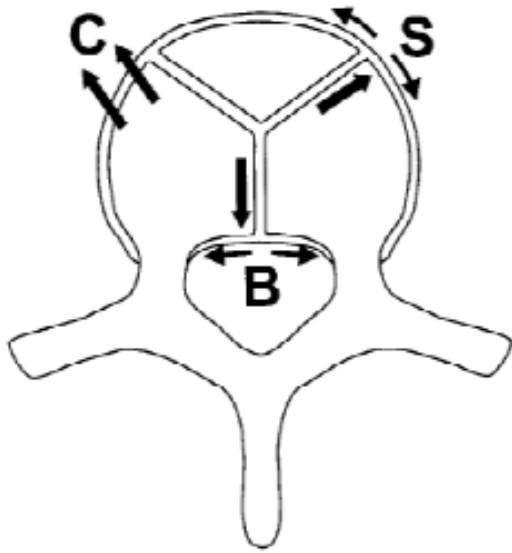


Figure-2. Diagram showing the classification of patterns of cement leakage. Type B is a leakage via the basivertebral vein, type S via the segmental vein, and type C through a cortical defect.

16 (43.2%) patients. Type B leakages were found in 9 (24.3%) patients, type C in 5 (13.5%) patients and type S in 2 (5.4%) patients. None of these leakages presented any clinical importance ^(5,7).

DISCUSSION:

Extrapedicular route is recommended for levels cephalad to T8 because of corpus-pedicle orientation ^(5,6). At the thoracic spine (especially at the upper thoracic spine) pedicles are situated nearly perpendicular to the vertebral body. Although the transpedicular route is the classical

way for needle placement for the rest of the levels (T9-L5), experience and practice of the surgeon is the decisive influence for needle placement for each individual case ^(3,5).

Leakage of cement after vertebroplasty has been reported in between 38% and 72.5% of cases. It may cause pulmonary embolism and neurological complications including myelopathy and radiculopathy. Type B is a leakage via the basivertebral vein, type S via the segmental vein, and type C through a cortical defect ⁽⁷⁾. Type B leaks are contained in the epidural veins, there is no barrier in type-C and the cement can extend without restriction. A type C leak into the spinal canal can be much more dangerous than a type B leak. Type S leaks may cause embolism more commonly than type B leaks because the segmental veins are closer to the large veins than the epidural veins ^(3,5).

We had encouraging results in metastatic lesions and osteoporotic vertebral compression fractures with this technique. All patients had significant pain relief after the procedure. Percutaneous vertebroplasty seems to be an inexpensive, effective, nearly non invasive and quick way to obtain pain relief in suitable patients. Extrapedicular route seems to be a useful and safe way to obtain satisfactory results in percutaneous vertebroplasty as an alternative option against classical transpedicular route. However, a careful technique is mandatory to obtain satisfactory results.

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