Preventing A Complication at Vertebroplasty: Case Report

Vertebroplastide Bir Komplikasyonun Önlenmesi

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ABSTRACT Injection of polymethylmethacrylate (PMMA) into vertebral bodies is performed to stabilize fractures and for rapid pain relief. Although the intervention has generally been considered safe, several severe complications of this procedure have been reported. In this report we wanted to emphasize the importance of performing radioopaque material, and to prevent a complication before cement injection during percutaneous vertebroplasty. A 62 years old female patient was admitted to our algology policlinic for low back pain. A L4 compression fracture was diagnosed in manyetic resonans (MR). Before cement application, venous drainage was seen on the screen after injection of radioopaque material. It was decided to postpone procedure. The day after she was discharged to without any problem. A careful real time fluoroscopic monitoring with the injection of opaque material could minimize the risk of cement embolization.

Key Words: Lumbar Vertebrae; radio-opaque; complication

ÖZET Polymethylmethacrylate (PMMA)'ın vertebral cisime enjeksiyonu, oluşan kırıklar sonrası stabilizasyonu ve ağrının hızla azalmasını sağlar. İşlem her ne kadar güvenli sayılsa da, bazı ciddi komplikasyonlar rapor edilmiştir. Bu vaka sunumunda perkutan vertebroplasti öncesi çimento uygulamadan önce, komplikasyonu önlemek için radyoopak madde vermenin önemini vurgulamak istedik. 62 yaşında bayan hasta alogoloji kliniğine alt bel ağrısı nedeniyle baş vurdu. Manyetik rezonanas (MR) incelemesinde L4 kompresyon fraktürü tanısı kondu. Çimento uygulaması öncesinde, radyoopak material uygulanımı sonrasında venöz drenaj görüldü. İşlemin ertelenmesine karar verildi. Ertesi gün hasta komplikasyonsuz olarak taburcu edildi. Dikkatli bir şekilde eş zamanlı floroskopi uygulamasıyla radyoopak madde enjeksiyonu çimento embolizasyon riskini minimuma indirebilir

Anahtar Kelimeler: Lumbal vertebra; radyoopak; komplikasyon

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Percutaneous vertebroplasty (PVP) is an effective, minimally invasive procedure in which polymethylmethacrylate (PMMA) cement is injected into a diseased vertebral body. This technique provides pain relief and strengthens weakened vertebral bodies. Vertebroplasty has gained widespread popularity for the treatment of benign or malignant compression fractures since its initial description 23 years ago.[1] The procedure is minimally invasive and is mostly performed under local anesthesia and conscious sedation[2,3] even in high-risk patients.[4]

Although the intervention has generally been considered safe, several severe complications of this procedure have been reported; these are mainly due to embolization of fat, bone marrow, or PMMA monomer.[5,6] The reported complication rates range from 1 to 10%.[7]

The following report describes a case of compression fracture and the importance of performing radioopaque material before cement injection during percutaneous vertebroplasty in terms of preventing lethal complications.[8]

CASE DESCRIPTION AND TECHNIQUE

A 62 years old female patient was admitted to our algology policlinic for low back pain. After physical examination lumbal MR was planned. A L4 compression fracture was diagnosed in MR. So; it was decided to proceed with PVP of the L4. After obtaining informed patient concent she was admitted to the operating room. On arrival in the operating room, the patient, who had not received any premedication, was monitored according ASA standards. 20 gauge angiocath was performed from left hand in the operating room. An infusion of 500cc saline 0.9% was commenced and then she was turned to the prone position. An adequate plane of anesthesia was obtained by using injectable fentanyl (Fentanyl, Abbott Lab. İth. İhr. ve Tic.), midazolam (Dormicum, Roche Müstahzarları Sanayi A.Ş.), and local injection of 1% Lidocain (Jetokain Simplex Ampul, Adeka İlaç Sanayi). During the entire procedure, she was given oxygen 5 L/min. During insertion of the injection needles, arterial blood pressure was approximately 140/50 mmHg, heart rate was 75-90 bpm, respiratory rate was 12 to 16 breaths/min, oxygen saturation was 100%, and the patient was arousable and responsive.

A small incision was made over the left L4 pedicle, and an 11-gauge bone trocar was advanced under fluoroscopic guidance into the L4 vertebral body using sterile technique and fluoroscopic guidance under local anesthesia. Under fluoroscopic observation, before injection of PMMA, incremental dose omnipaque was started to injected. After injection of radioopaque material venous drainage was seen on the screen (Figure 1). It was decided to postpone procedure. Patient was send to post anesthesia care unit for recovery. The day after she was discharged without any problem, and scheduled for vertebroplasty for an other day. She continued her pain therapy with 50 mg tramadol (Contramal, Abdi İbrahim İlaç Firm.) three times a day until the day of procedure.

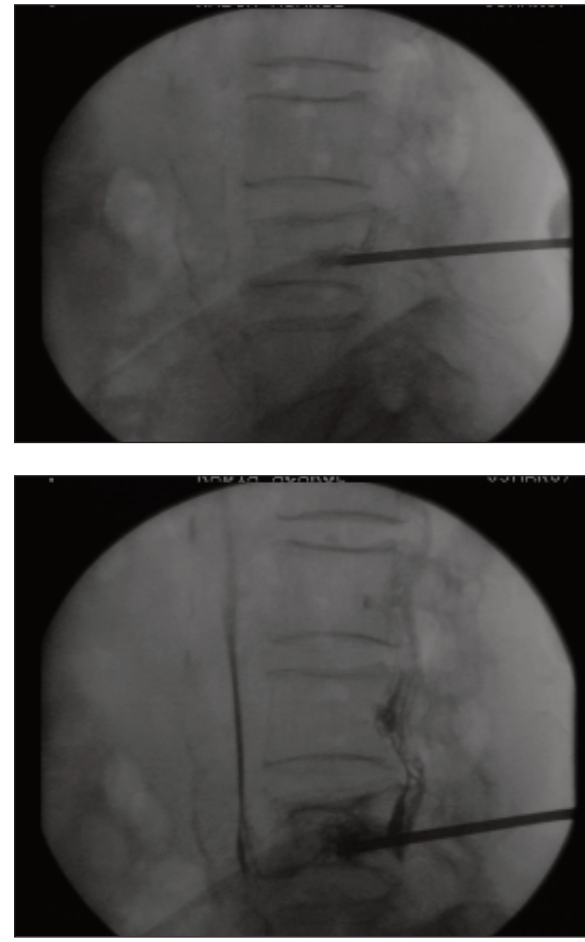

FIGURE 1: A real time lateral fluoroscopic screen before (A) and after (B) the injection of opaque material.

DISCUSSION

Image-guided percutaneous vertebral augmentation or PVP, was first performed in France in 1984, when Deramond and Galibert et al.[1] injected PMMA into the C2 vertebra, which had been partially destroyed by an aggressive hemangioma. Over the next 15 years, many groups advocated expanding the indica-

tions for PVP to include osteoporotic compression fractures, traumatic compression fractures, and painful vertebral metastasis.[9-13] Our case had the anterosuperior fracture of the L4 body without destruction of the posterior wall and significant vertebral collapse so that it could not lead to a technically difficult vertebroplasty procedure; or might not constitute relative contraindications.[9]

The possibility that the cement embolism was caused by insufficient polymerization of the PMMA at the time of injection could not be excluded. In addition, Martin et al.[14] reported that complications were mainly related to an excessive PMMA injection.

Good-quality fluoroscopy is essential for the early detection of a minimal cement leakage into the perivertebral vein. Jensen et al.[11] recommended a barium/tungsten combination in order to allow for adequate visualization of venous flow as well as early detection of venous PMMA migration during fluoroscopy. In our case, possible cement embolism caused by perivertebral venous migration was early recognized by injection of radioopaque material. Injection was performed under lateral fluoroscopy, paying particular attention to the epidural space, the spinal canal, and the perivertebral veins. Unfortunately, in many of the case reports in the literature injection of radioopaque material was not performed or passed over, and not mentioned in the reports which were concluded by deaths. However this simple practice could be life saving in many of the reports. Gangi et al.[15] recommended that CT guidance increases precision, improves the results, and reduces complications. But at least real time fluoroscopy could be performed in many of the clinics.

CONCLUSION

Increasing numbers of elderly patients with osteoporotic spine fractures will undergo percutaneous vertebroplasty, which is generally a fast and effective procedure. We believe that physicians should be aware of the fracture pattern, anatomy of the vertebral venous system, and careful real time fluoroscopic monitoring with the injection of opaque material to minimize the risk of cement embolization during the PVP.

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