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Case report: Treatment by radiofrequency kyphoplasty of an 85-year-old woman with traumatic osteoporotic fracture of the first lumbar vertebra

P. Heck, H. Bayer-Helms

Abstract: A 85-year old female patient had an A1.2-fracture of the L1 after a fall on the lower back. The fracture was treated with radio frequency kyphoplasty on the following day. Without complications during the course, the patient could be dismissed free of pain on the second day post-op. After 3 month follow-up the patient was painless in the area of the lumbar spine and without functional restrictions. The X-ray examination showed neither changes in the location of L1 nor adjacent fractures. The indication was put by request of the patient divergent to the guidelines. The discussion about the benefits of treatment with balloon kyphoplasty versus medicinal pain treatment is still controversial. There are no studies on RF-Kyphoplasty and its advantages over the mentioned procedures. However, all cases being published so far including this case out of a series of positive cases lead to the assumption that RF-Kyphoplasty is at least equivalent to established procedures, if not better. However, further studies are required. **J Miner Stoffwechs 2011; 18 (Supplement 1): 29–31.**

Case report

An 85-year-old woman was brought in supine position to the emergency department by the ambulance. She reported having fallen on her back from a ladder from a height of about 1.5 meters. The patient had not been unconscious and had experienced no peripheral pain or neurological symptoms. At the investigation she complained of pain at rest and on motion in the upper lumbar spine. On the visual analog scale for pain (0 to 10) the patient assigned a score of 6 to 7 [1]. She had a marked pain on percussion. Peripheral motor and sensory functions as well as circulation were intact. Reflexes were identical on both sides.

X-rays of the lumbar and the thoracic spine in two planes showed a wedge-shaped reduction in the height of the first lumbar vertebra, in keeping with a A1.2-fracture according to Mueller-Magerl's classification [2]. We also found generalized osteoporosis which had favored the occurrence of a fracture. The posterior margin was intact on plain films. Thus, the fracture was deemed stable (Figure 1, 2).

The patient was informed about the options of conservative as well as surgical treatment. She was also informed about the possibility of initial pain therapy and subsequent surgery after three weeks, as specified in the guidelines. However, the patient wished to undergo early surgical treatment. Therefore, based on the reports and the clinical symptoms we established the indication for kyphoplasty of the first lumbar vertebra.

The operation was performed the subsequent day and took 20 minutes. The patient was placed in prone position and given intubation anesthesia. Two C-arms were positioned in anteroposterior and lateral projection to each other. The level was first marked on the skin. Through a unipedicular left-sided access the trocar was introduced by the usual technique and radiofrequency kyphoplasty was performed with no complications.

Postoperatively the patient was mobilized without difficulties the next day. She only reported mild pain at the region of the access in the lumbar spine (scored 1 on the visual analog scale for pain). The patient was discharged from the hospital on the second postoperative day. Figures 3 and 4 show the first lumbar vertebra in two planes. The height reduction of the anterior margin could be almost completely eliminated. The local kyphosis angle was corrected by nearly 15 degrees. No extravasations occurred and the bone cement was in regular position.

Treatment with 70 mg alendronate sodium in combination with 2800 I.U. cholecalciferol (Fosavance®) once a week was initiated. The patient was transferred to the orthopedic department for further treatment.

The patient presented at our department after three months. She again reported no pain in the specific region of the spine but complained of recurrent pain in the cervical spine which, however, had existed prior to the fall. She took painkillers as required for her symptoms in the cervical spine – approximately once a week. She had performed gymnastics and exercises for three weeks postoperatively.

At the physical examination we found a bland scar and no pain in the lumbar spine on pressure or percussion. The patient's score on the pain scale was 0. The finger-floor distance was 30 cm, painless, and there was no disturbance of motor and sensory functions or peripheral circulation. X-rays of the lumbar spine showed the cement filling to be in

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Figure 1: First lumbar vertebra, anteroposterior view, preoperatively

Figure 2: First lumbar vertebra, lateral view, preoperatively

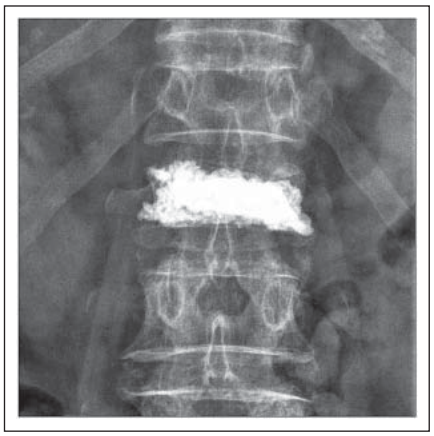

Figure 3: First lumbar vertebra, anteroposterior view, postoperatively

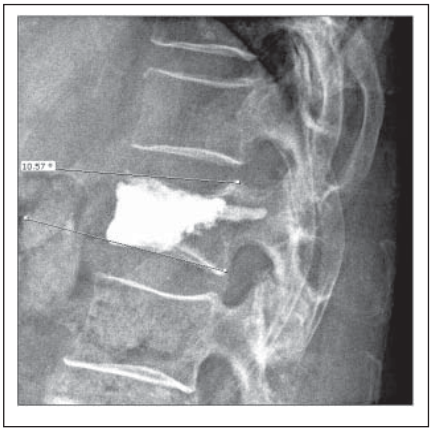

Figure 4: First lumbar vertebra, lateral view, postoperatively

Figure 5: First lumbar vertebra, anteroposterior view, after 3 months

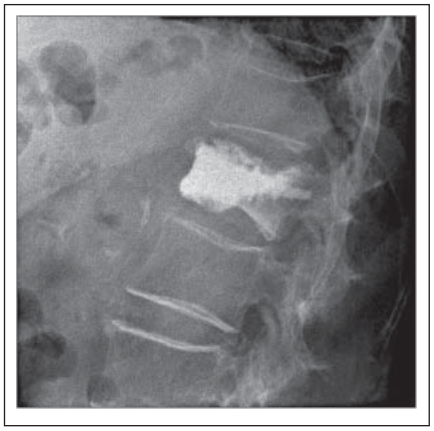

Figure 6: First lumbar vertebra, lateral view, after 3 months

regular position and no change in cement filling or the height of the vertebral body (Figure 5, 6).

Discussion

The possibility of achieving surgical pain reduction by the use of radiofrequency kyphoplasty is presented in this clinical case report. The course of the procedure was entirely uneventful. Viewed together with subsequent operations performed at our hospital, most of which were very successful in terms of therapy, we consider radiofrequency kyphoplasty a good or even excellent alternative to the existing conservative and surgical therapy options. The S3 guidelines of the "umbrella organization of osteology" (Dachverband Osteologie; DVO) recommend surgical intervention by kyphoplasty or vertebroplasty only after drug therapy has been attempted for three weeks and has failed.

Our patient refused this option after she had been informed in detail about all potential options.

A general difficulty as regards the indication is that even the guidelines describe the studies on this subject as being inconsistent. Currently we have studies that demonstrate the superiority of balloon kyphoplasty over drug therapy, as well as studies that do not confirm such superiority [4–6]. The impact of a placebo effect by surgery could not be measured validly thus far. Even the avidly discussed question of subsequent fractures in adjacent vertebral bodies after balloon kyphoplasty is associated with similar difficulties [7, 8].

The authors of the guidelines have criticized the quality and validity of the studies performed thus far [9].

Radiofrequency kyphoplasty is approved since 2008. The unique method of bone cement delivery in combination with the alternative method of cavity preparation in the vertebral body justifies the assumption that the results differ not only in comparison with vertebroplasty, but also in comparison with the established procedure of balloon kyphoplasty. Representative studies on radiofrequency kyphoplasty are lacking. However, based on the positive clinical results thus far in all cases, we consider it justified to establish the indication for RF kyphoplasty.

Conclusion

The authors believe that radiofrequency kyphoplasty fulfills the demands imposed on any treatment of a vertebral body compression fracture as does the established and proven method of balloon kyphoplasty. Due to the unipedicular access which is selected in most cases, targeted preparation of the cavity in the vertebral body and especially the markedly higher viscosity of the PMMA cement achieved by use of radiofrequency energy, the

already low complication rate of balloon kyphoplasty can be reduced even further. The case described here is representative of a series of successful operations performed thus far, all of which have been entirely devoid of complications.

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