

Percutaneous injectable synthetic calcium sulfate for the enhancement of percutaneous spinal fusion.

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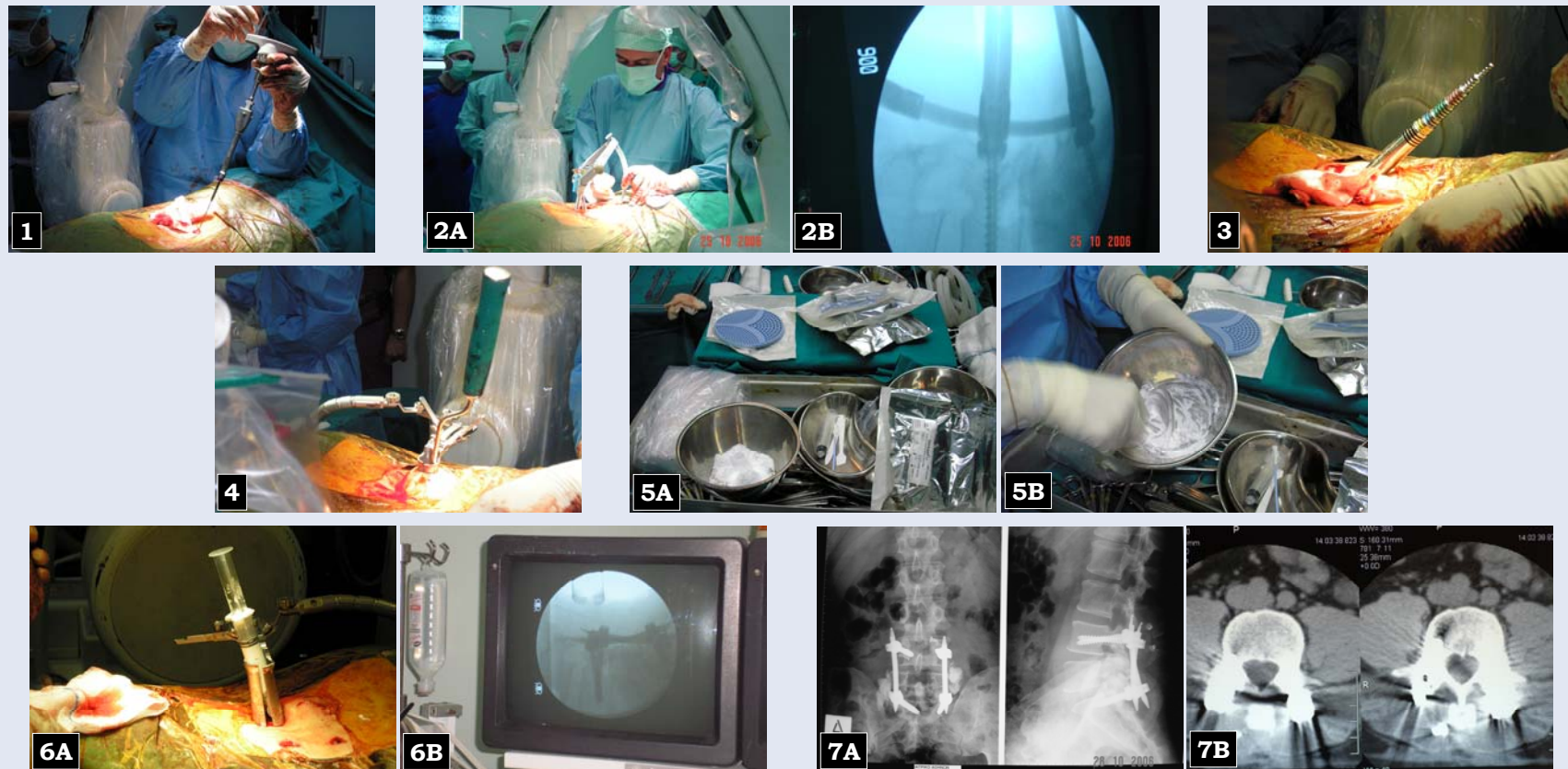
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Introduction

Percutaneous spinal fusion is a minimally invasive posterior spinal stabilization with minimal dissection and soft tissue retraction, no muscle stripping and complete preservation of posterior elements. Although the application of bone grafts in order to achieve a solid fusion is well recognized, many surgeons do not use bone grafts due to the difficulty of their percutaneous application. We present a case of percutaneous spinal fusion with percutaneous application of injectable synthetic calcium sulfate.

Methods

A 46-year-old male has undergone percutaneous L4-S1 posterolateral spinal fusion for L5 spondylolysis. A Sextant percutaneous spinal fusion device (Medtronic, USA) has used under fluoroscopic control. Always under fluoroscopic control, with the use of multiple dilators through the Quadrant device (Medtronic, USA), we have prepared the fusion area with a long and thin curette, in order to extract the periosteum and bring the synthetic bone substitute in contact with the bone. As bone substitute we have used injectable Stimulan kit synthetic calcium sulfate (Biocomposites, UK), which has been injected with the use of a syringe with a radioopaque special extension. The Stimulan synthetic bone substitute is high purity calcium sulfate without the risk of transmission of any kind of disease, it sets in ten minutes and is radioopaque and therefore easily detected under fluoroscopic control for the verification of its proper application.



Legends to figures:

Figure 1: Percutaneous placement of pedicle screw under fluoroscopic control.

Figure 2 A,B: Percutaneous placement of the rod under fluoroscopic control.

Figure 3: Creating the graft placement pathway with multiple dilators.

Figure 4: Preparation of the fusion area with a long and thin curette through the Quadrant device under fluoroscopic control.

Figure 5 A,B: Preparation of the injectable Stimulan kit synthetic calcium sulfate.

Figure 6 A,B: Percutaneous injection of the injectable bone graft, with the use of a syringe with a radioopaque special extension, through the Quadrant device under fluoroscopic control.

Figure 7 A,B: Postoperative plain radiographs and computed tomography scans showing the incorporation of the calcium sulfate bone graft.

Results

Three months postoperatively the patient is pain free and has returned to his previous activities. Plain radiographs and Computed Tomography scans have showed a successful solid spinal fusion with complete resorption of calcium sulfate and its replacement with newly formed bone.

Conclusions

Percutaneous spinal fusion is a minimally invasive posterior spinal technique with minimal paraspinal tissue trauma without compromising the quality of spinal fixation. Percutaneous application of injectable synthetic calcium sulfate is a safe and effective method for the enhancement of percutaneous spinal fusion.

References

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2. A.G. Hadjipaylou et al, Plaster of Paris as an Osteoconductive material for Interbody Vertebral Fusion in mature sheep. *Spine* 25(1): 10-16, 2000.