loosening and even the porous coating can peel off from the shell. The Romanus Combination Cup has few advantages over the corresponding totally coated press-fit cups. Manufacturers should pay special attention to the chemical bonding in the titanium plasma-spraying process.

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# Posterior extradural disc fragment—a case report

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A 90-year-old woman with no previous medical history felt a sudden onset of severe low back pain. Over the following 10 days, the pain radiated to the anterior aspect of her thighs, and weakness and urinary incontinence developed in both legs. 20 days after onset of these symptoms, she was admitted to our hospital: she presented with severe bilateral leg pain and could not stand or walk. The segments below L2 showed hyposthesia bilaterally. Achilles and patella tendon reflexes were absent. Femoral nerve stretch tests were positive, while straight-leg raising tests were negative. Muscle strength evaluation revealed grade 0 or 1 power in the muscles of the lower extremities below the iliopsoas level.

Radiographs showed lumbar scoliosis and narrowing of the second lumbar disc space, marginal osteophytes at that level, but no bony destruction. Myelography showed a complete stenosis at the L1–2 level (Figure 1). MRI at the L1–2 level exhibited an oval, smooth rounded lesion with a signal intensity equal to

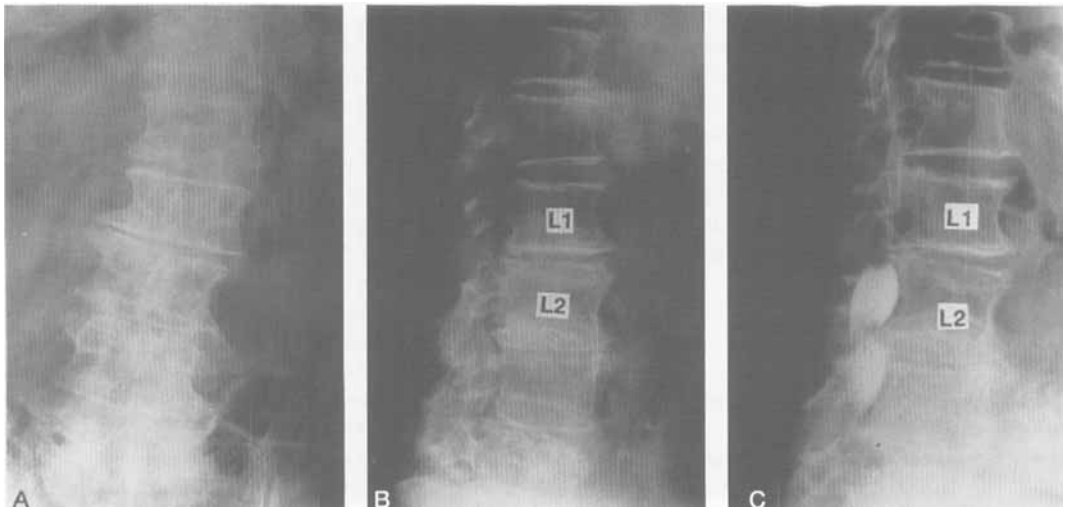



Figure 1. Lumbar spine films show scoliosis and marginal osteophytes at upper levels. Myelography shows a complete stop at the L1–2 disc..

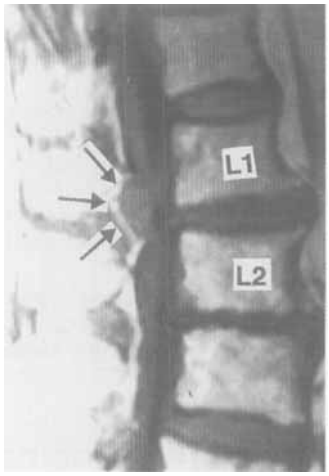


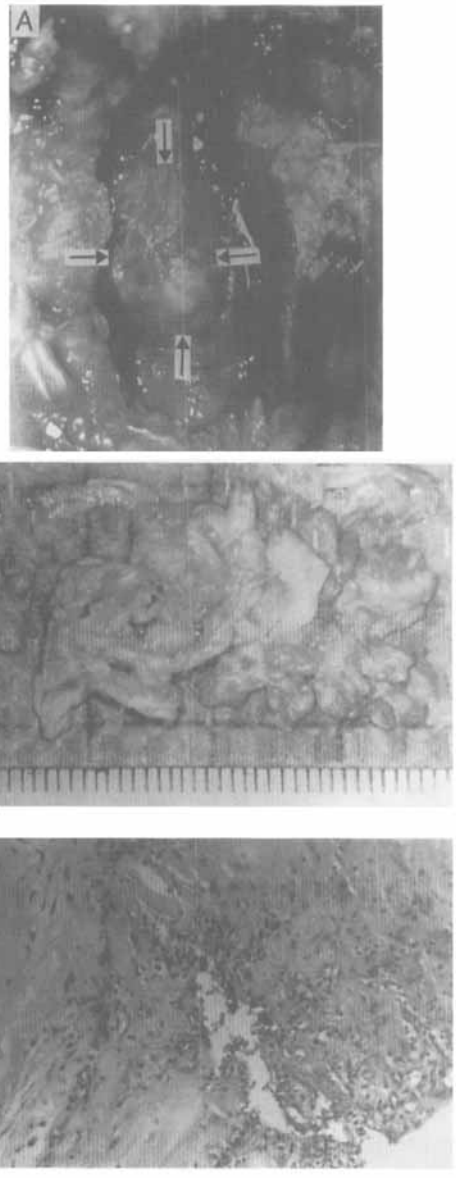

Figure 2. Magnetic resonance imaging exhibits an oval lesion at the L1–2 level.

the disc. The thecal sac was compressed by both protrusion of the intervertebral disc anteriorly and the oval lesion posteriorly (Figure 2).

Because of the severe pain and neurologic deficits,we decided on surgery 30 days after the onset of the pain. Laminectomies of L1 and L2 were performed. A glossy fibrous mass covered the dorsal surface of the dura mater over an area of about 20 × 10 mm. This mass was resected using microsurgical techniques. It was easily removed from the dura and was connected with a L1-2 intervertebral disc space from the right lateral side through a tear in the posterior longitudinal ligament. Thus, it was diagnosed as an extradural fragment of disc, a diagnosis confirmed on histologic examination (Figure 3).

After surgery, the patient's radicular symptoms completely resolved. In the third postoperative month, she had no neurologic deficits and pain.

Figure 3. Findings during surgery (A), resected specimen (B) and histologic specimen (C).




Histological examination showed that the resected specimen consisted of disc material. The granulation tissue penetrated to the disc material. There was moderate infiltration of monocytes, but cell infiltration was less than that seen in infection. The disc material showed severe degeneration, such as microcyst formation (H&E, ×200).

## Discussion

A dorsally displaced fragment of lumbar disc herniation is rare. The first 2 cases were described by Lombardi in 1973, a third by Lichtor in 1989, and a fourth and fifth by Hirabayashi et al. and Lutz et al. in 1990. Our case is the sixth reported in the English language literature. In all of the 6 cases, the levels of the lesion are higher than disc herniations usually are (1 case was at L1–2, 3 cases were at L2–3 and 2 cases were at L4–5). The mean age of the 6 patients was 59 years, which is older than usual. It seems that severe disc degeneration is a prerequisite so that disc material can migrate to the posterior epidural space. Peacock (1952) stated that true herniation of the nucleus pulposus should become less frequent with age. Harada and Nakahara (1989) demonstrated that the fragments from herniated lumbar discs were composed of the anulus fibrosus and the cartilaginous end-plate in 70–80% of discs from patients over 60 years. In the elderly, sequestrated herniation and/or upper lumbar disc

herniation have been shown to occur more frequently than in young adults (Aronson and Dunsmore 1963, Maistrelli et al. 1987). The diagnosis was not suggested before surgery in our case and in previous ones (Hirabayashi et al, 1990). The lesion should be considered in the differential diagnosis of epidural tumor or hematoma, especially when the patient is elderly.

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# Removal of a broken solid intramedullary interlocking nail A technical note

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A 25-year-old Dutch soldier was injured in a car accident in Bosnia. He sustained an open transverse tibial fracture with a butterfly fragment and medial malleolar fracture of the right leg. The patient was operated on with open reduction and fixation of the fracture with a plate. Because of nonunion the plate was removed and an unreamed, intramedullary nailing with an 8-mm solid distally locked nail was performed. Autogenous bone-grafting was performed and an oblique osteotomy of the fibula was also carried out. After 4 months there was no union and the nail had migrated proximally blocking extension of the knee. We decided to replace the nail, but several days before the operation the nail broke through one of the distal holes.

A standard slotted nail was modified to glide over the 8 mm solid nail. First, the proximal part of the solid nail was removed. Then a guide wire was used as a conductor for the slotted nail. The slotted nail was moved over the distal part of the solid nail, while the distal interlocking bolt was still in place to prevent the distal end of the solid nail pushing into the ankle joint. After removal of the interlocking bolt, the slotted nail was advanced, so that the boltholes fell exactly over each other. To couple both nails, a thin flexible iron wire was brought in and both nails were removed. This was replaced with a 14 mm slotted nail after additional reaming and union occurred 2 months later.

Distal tibia, the proximal part of the solid nail is replaced by a guide wire.

Distal tibia, the custom-made slotted nail glides over the solid nail untill both boltholes fall exactly over each other.

After coupling both nails with an iron wire, the nails were removed.