Inadvertent Dural Puncture during Caudal Approach by the Introducer Needle for Epidural Adhesiolysis Caused by Anatomical Variation

Si Gon Kim, MD, Jong Yeun Yang, MD, Do Wan Kim, MD, and Yeon Ju Lee, MD

Department of Anesthesiology and Pain Medicine, Ajou University College of Medicine, Suwon, Korea

There have been reports of abnormalities in the lumbosacral region involving a lower-than-normal termination of the dural sac, which is caused by disease or anatomical variation. Inadvertent dural puncture or other unexpected complications can occur during caudal epidural block or adhesiolysis in patients with these variations, but only a small number of case reports have described this issue. We report a case of dural puncture by the introducer needle before attempting caudal epidural adhesiolysis, which occurred even though the needle was not advanced upward after penetrating the sacrococcygeal ligament. Dural puncture was caused by a morphological abnormality in the lumbosacral region, with no pathological condition; the dural sac terminal was located more distally than normal. However, dural puncture could have been prevented if we had checked for such an abnormality in the magnetic resonance imaging (MRI) taken before the procedure. (Korean J Pain 2013; 26: 203-206)

Key Words:
anatomical variation, caudal block, dural puncture.

There have been reports of abnormalities in the lumbosacral region involving a lower-than-normal termination of the dural sac, which is caused by disease or anatomical variation. Inadvertent dural puncture or other unexpected complications can occur during caudal epidural block or adhesiolysis in these patients. Dural puncture occurs because the spinal cord terminates abnormally low, with the dural sac tip located in the lower sacrum; this can be accompanied by pathological conditions such as cystic structures [4].

The authors saw a 51-year-old male patient complaining of radiating pain in the lower extremities. To attempt caudal epidural adhesiolysis, the sacrococcygeal ligament was punctured with the introducer needle, but the dural puncture occurred even though the needle was not pushed upward. The lumbar magnetic resonance imaging (MRI) studied afterwards showed that the dural sac tip was abnormally extended to the lower sacrum. We are reporting this case to advise others to consider the possibility of dural puncture and complications due to ana-
CASE REPORT

A 51-year-old male patient came to the hospital complaining of bilateral buttock pain that had begun 5 years earlier and bilateral radiating pain in the lower extremities. The patient history showed that he had been in manual labor for 10 years, and he had undergone a L4-5 discectomy in another hospital for the above symptoms 2 years previously. The pain had not been relieved, however, and he had been receiving drug and physical therapy, but the pain had recently worsened. The pain was exacerbated when the patient remained in one position or walked for a long time, whereas the pain was relieved when he kept still. The pain was characterized as a continual tingling pain, with a degree of 7/10 on the visual analogue scale (VAS).

The physical examination showed no mobility or sensory disorder, and the deep tendon reflex was also normal. There were no abnormalities other than a reduction to approximately 60 degrees on both sides in the straight leg raise test. Basic pre-operative testing results were normal, and only mild degenerative spondylosis was observed in the lumbar x-ray. The lumbar MRI revealed disc extrusion from the L4-5 center to the left intervertebral foramen and small disc protrusion in the L5-S1 right center, but the patient’s symptoms were limited to the bilateral L5 dermatome. Recurred lumbar disc herniation and failed back surgery syndrome were suspected.

L5-selective transfominal epidural block was performed twice in the clinic, but the improvement in symptoms did not continue for more than 5 days. Therefore, caudal epidural adhesiolysis was scheduled, and the patient was hospitalized. Before the operation, the patient was placed in the prone position, and the sacral hiatus area was disinfected with 10% povidone-iodine solution and chlorhexidine. The operating area was covered with a surgical drape. The sacral hiatus was identified with C-arm, and infiltration anesthesia was performed with 4 ml of 1% lidocaine. Then, as the 17-G introducer needle punctured the sacrococcygeal ligament, a clear fluid flowed out through the needle, with a loss of resistance. The length that the introducer needle was pushed in was approximately 2 cm from the skin, and 3 ml of the contrast medium iopamidol (Iopamiro 370®, Ilsung Pharm Co., Seoul, Korea) was injected through the needle to observe the myelogram spreading to the L4 level or above (Fig. 1). We concluded that unexpected dural puncture had occurred, and the patient was placed under observation after removal of the introducer needle.

The patient’s MRI was examined again, and it showed a low termination of the dural sac, with the dural sac tip located below the S3 level (Fig. 2). However, there were no accompanying pathological conditions, such as ameningeal structure forming cystic structures. The patient

Fig. 1. Contrast dye injection to the introducer needle showed a myelogram in the anteroposterior view.

Fig. 2. Sagittal T1-weighted (A) and T2-weighted (B) MR images show extension of dural sac to the lower level of sacrum.