Case Report

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A symptomatic lumbosacral perineural cyst -A case report-

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Lumbosacral perineural cysts are formed by the arachnoid membrane of the nerve root at the lumbosacral level. Most of these cysts are asymptomatic and are found incidentally during computed tomography (CT) or magnetic resonance imaging (MRI) for other causes of chronic lower back pain. This type of cyst requires a differential diagnosis to distinguish it from other causes of radiating pain and neurological symptoms. In the present case, a symptomatic lumbosacral perineural cyst was found, and pain relief was achieved by non-surgical treatment. A lumbosacral perineural cyst was identified from a differential diagnosis of a lumbar disc disorder that presented as radiating pain and neurological symptoms. (Korean J Anesthesiol 2012; 62: 493-496)

Key Words: Low back pain, Radiculopathy, Steroids, Tarlov cysts.

Chronic low back pain is pain for 3 months or more, and can be caused either by noxious stimulation of the lumbar muscle, interspinous ligaments, facet joint, sacroiliac joint, and intervertebral disc, or mechanical or chemical irritation of dura matter [1].

Of the many causes of low back pain, a perineural cyst is detected frequently by chance in patients with low back pain during the diagnostic process but is mostly asymptomatic. Using magnetic resonance imaging (MRI), the authors found a symptomatic lumbosacral perineural cyst in a patient who complained of low back pain and lower limb radiating pain that had persisted for 5 years. The pain was reduced using nonsurgical procedures, such as epidural block. These results are reported with a discussion of the relevant literature.

Case Report

A 49-year-old female patient visited the authors' hospital with right low back pain and right lower limb radiating pain that had persisted for 5 years. The patient complained of a dull pain in the right lumbar region and along the right S1 dermatome. The pain worsened when the patient was sitting, walking or coughing, and was alleviated when she was lying in the bed, even though it still disturbed her sleep. At the time of presentation, her visual analogue scale (VAS) was 75/100 mm and her Oswestry disability index (ODI) was 48% [2]. She had no particular disorders related to the pain. A physical examination showed sensory loss of 30% along the right S1 dermatome without weakness. The patient's knee jerk was normal, and

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the straight leg raising test showed a positive result at 60° in the right lower limb. The pulsation of the posterior tibial artery of both lower limbs was palpable. The laboratory test of the thyroid and adrenal cortical hormone showed no particular findings. The MRI of the lumbar vertebra showed a perineural cyst (oval shape, 1.3 × 1.1 × 1.5 cm) encircling the right S1 nerve root at the level of the intervertebral disc between L5 and S1 (Fig. 1). The cyst was considered to be a symptomatic perineural cyst, so selective nerve block through the sacral foramina in the right S1 was performed using 20 mg of triamcinolone and 3 ml of 0.1% ropivacaine for the right low back pain and lower limb radiating pain. A non-steroidal anti-inflammatory drug, muscle relaxant, and gabapentin were prescribed. One week later, the patient reported that her right lower limb radiating pain had disappeared immediately after the procedure, and that her right low back pain was alleviated by VAS 52/100 mm. As the low back pain was alleviated by the medial branch block of the right L4 and L5, radiofrequency thermocoagulation was performed in the same region. Three months after the procedure, the radiating pain along the right S1 dermatome disappeared. Although the hypesthesia remained, the VAS for the low back pain was 22/100 mm, and the result of the straight leg raising test was negative.

Discussion

A lumbosacral perineural cyst consists of the arachnoid membrane of the nerve root in the spinal dura matter. The concept of this disease was established in 1938 when Tarlov reported 5 cases of a lumbosacral perineural cyst during a postmortem examination [3,4].

Although this cyst is rare, Langdown et al. [3] reported that an MRI on 3,535 patients with low back pain revealed perineural cysts in 54 (1.52%) of them. Although the cause of perineural cysts is unclear, theories have attributed its cause to congenital [5], traumatic [6], and inflammatory factors [3]. These factors lead to the growth of the arachnoid membrane, which blocks the normal pathway of the cerebrospinal fluid and causes the cyst.

Studies have attributed the cause of the growth of the cyst to a range of factors, such as the active secretion of the inner cells of the cyst, the osmotic difference between the arachnoid

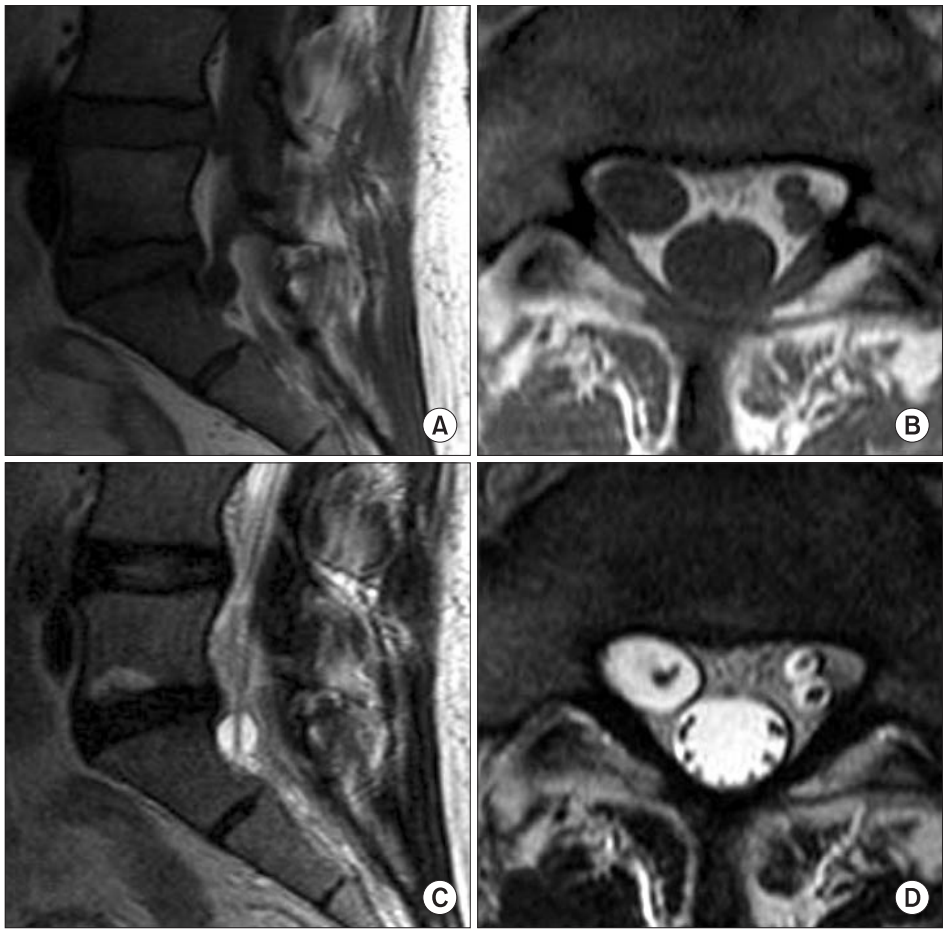

Fig. 1. The MRI of lumbosacral region demonstrates a cystic area in the right spinal canal at L5 and S1 intervertebral disc level. It appears hypointense on T1-weighted image (A, B), and hyperintense on T2-weighted image (C, D).

membrane and cyst, the pulsation pressure of the cerebrospinal fluid, and the formation of a valve between the cyst and subarachnoid space. The most convincing theory, however, is that the cyst grows due to the action of the valve [5,6].

Histologically, communication between the cyst and the subarachnoid space is possible because the inner membrane of the cyst consists of the endoneurium, an extension of the pia, and the outer membrane consists of the epineurium, an extension of the arachnoid membrane. This is expected to lead to the filling up of the cyst with cerebrospinal fluid [3,6].

The cyst is generally asymptomatic but rarely causes radiating pain and neural symptoms if the surrounding nerves are compressed. In these rare cases, it results in hip pain along the sciatic nerve and perianal paresthesia, as well as decreases in muscular strength in the ankle joint, loss of tendon reflex, difficulty of urination or defecation, and sexual dysfunction. Pain also occurs as a result of compression of the sacrum by the cyst [3-7].

The cyst can be diagnosed using myelography, computed tomography (CT), or MRI. A myelography or a CT after the myelography can reveal a cyst on the delayed image. MRI can reveal a cyst that exhibits the same signal intensity as that of the cerebrospinal fluid [4,8-11].

In the MRI for the differential diagnosis of other diseases that cause low back pain, the cyst may be found with other lesions. Therefore, differentiation is needed to determine if the radiating pain and neural symptoms are due to a cyst or other lesion [5,6,8,12]. In The cyst in the current case is believed to a symptomatic perineural cyst because the patient complained of right low back pain and MRI revealed a perineural cyst on the right side.

Diseases that should be differentiated include the following: meningeal cysts that occur in the spinal epidural space, such as meningeal diverticula, meningeal pouch, and occult intrasacral meningocele; sacral extradural cysts and simple bone cysts in the extruded disc; lumbosacral stenosis; dermoid cysts; lipoma; and metastatic cancer [5,6,8,12].

CT-guided percutaneous aspiration can be performed for short-term control of the symptoms and pain to facilitate the diagnosis and treatment of pain.

Mitra et al. [13] reported cases wherein, in patients who complained of radiating pain and low back pain due to a perineural cyst, the pain was relieved with oral and epidural steroid therapy, and the symptom-causing perineural cyst disappeared from the MRI that was performed after the epidural steroid injection, which suggests that steroid therapy may be an initial treatment option for symptomatic perineural cysts. Surgical treatment is indicated for cysts that cause serious motor dysfunction or pain [10,13]. Surgical procedures include posterior spinal laminectomy, imbrication after removing the cyst, fenestration of the cyst and cyst shunting [7,8]. Jain et al. [7] reported that in patients who complained of chronic perineal pain and intermittent claudication, the pain was alleviated with posterior sacral laminectomy and fenestration of the cyst. Ju et al. [8] reported that in patients who complained of low back pain, right lower limb radiating pain, and hypesthesia due to a lumbosacral cyst, the lower limb radiating pain and hypesthesia were reduced with cyst shunting. Kunz et al. [14] reported that of the eight patients who received surgical treatment, only three showed symptomatic improvement, and four developed hypesthesia, difficulty of urination, asymmetric reflex of the lower limb, and neurological disorders based on the pathological electromyogram findings. In addition, Jain et al. [7] reported that surgical treatment should be avoided for cysts with highly involved nerve roots because the surgical treatment may aggravate the radiating pain. Therefore, surgical treatment should be performed only after the location of the cyst, the possibility of its recurrence and the experience of the surgeons have been considered sufficiently before surgery.

As invasive treatment and surgery can cause adverse events such as pseudomeningocele, intracranial hypotension, and CSF leak, steroid therapy can be a good initial option for patients at high risk, based on a pre-operative assessment [10,13].

Although intervertebral disc disorders could be suspected in patients who complain of radiating pain and intermittent claudication that accompany neural symptoms, the possibility of a lumbosacral perineural cyst could not be excluded. The authors successfully alleviated the pain in patients who complained of chronic low back pain and radiating pain using a non-surgical procedure.

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