

## LUMBAR PERINEURAL CYST WITH RADICULOPATHY: A CASE REPORT

### RADİKÜLOPATİYLE SEYREDEN LOMBER PERİNÖRAL KİST: OLGU SUNUMU

Forhad Hossain CHOWDHURY\*, Mohammad Raziul HAQUE\*

#### SUMMARY:

Perineural cysts occur most frequently at the sacral level. Sacral perineural cyst, so-called Tarlov cyst, was first described by Tarlov in 1938. We report a rare lumbar perineural cyst causing L5 radiculopathy along with short review of literature.

**Key Words:** Lumbar Radiculopathy, perineural cyst, Tarlov cyst.

**Level of Evidence:** Case report, Level IV

#### ÖZET:

Perinöral kistler sıklıkla sakral bölgede oluşur. Tarlov kisti de denilen sakral perinöral kist, ilk kez 1938 yılında Tarlov tarafından tariflenmiştir. Bu çalışmada bu kistin nadir bir yerleşimi olan lomber yerleşimine sahip bir vaka sunulmuş ve literatür ışığında hastalık ve tedavisi tartışılmıştır.

**Anahtar Kelimeler:** Lomber radikülopati, perinöral kist, Tarlov kisti

**Kanıt Düzeyi:** Olgu sunumu, Düzey IV

(\*) MD, Dr. Forhad Hossain Chowdhury FCPS (surgery), MS (Neurosurgery), Department of Neurosurgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh

## INTRODUCTION:

Perineural cysts occur most frequently at the sacral level. Sacral perineural cyst, so-called Tarlov cyst, was first described by Tarlov in 1938. Since then about 100 cases of symptomatic perineural cyst had been reported<sup>(13)</sup>. Langdown et al. reported Tarlov cysts as a relatively common finding on lumbosacral MRI with a prevalence of 1%–2%, and only 13% of cysts were directly responsible for symptoms<sup>(6)</sup>. Perineural cyst is very rare in lumbar spine.

We report a case of lumbar perineural cyst with radiculopathy along with short review of literature.

## CASE REPORT:

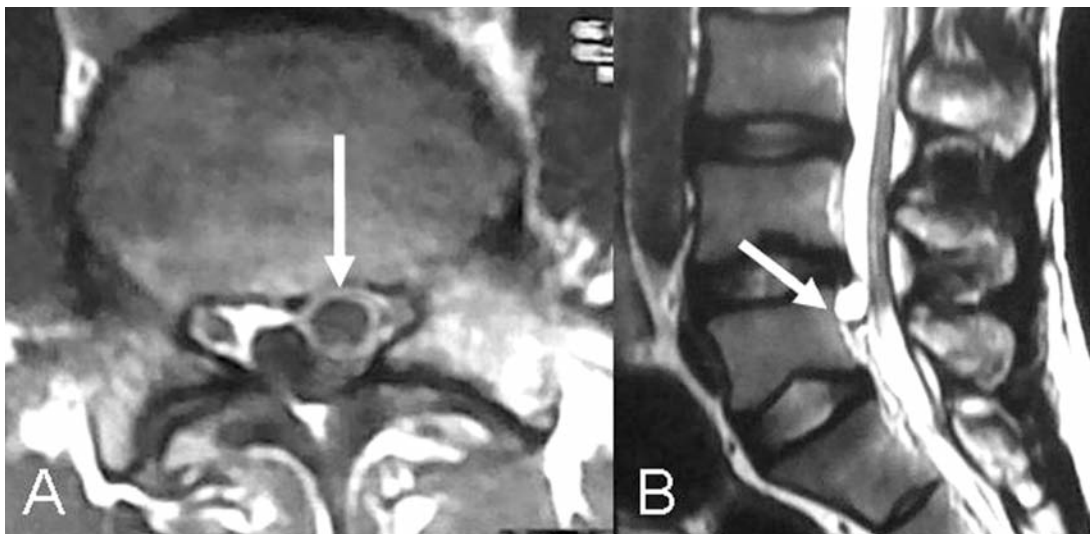
A 40-yr-old man presented with a 7-years history of progressively increasing left lower back pain along with radiation to left lower. Physical examination was unremarkable except for a positive straight leg-raising test on the left

side and mild tenderness at lower lumbar spine. Magnetic resonance imaging (MRI) showed a small extradural cyst on left side of spinal canal near the L4-5 intervertebral foramen that was compressing left L5 root along with dural sac. It was hypointense in T1W images and hyperintense in T2W images (Figure-1.a-b).

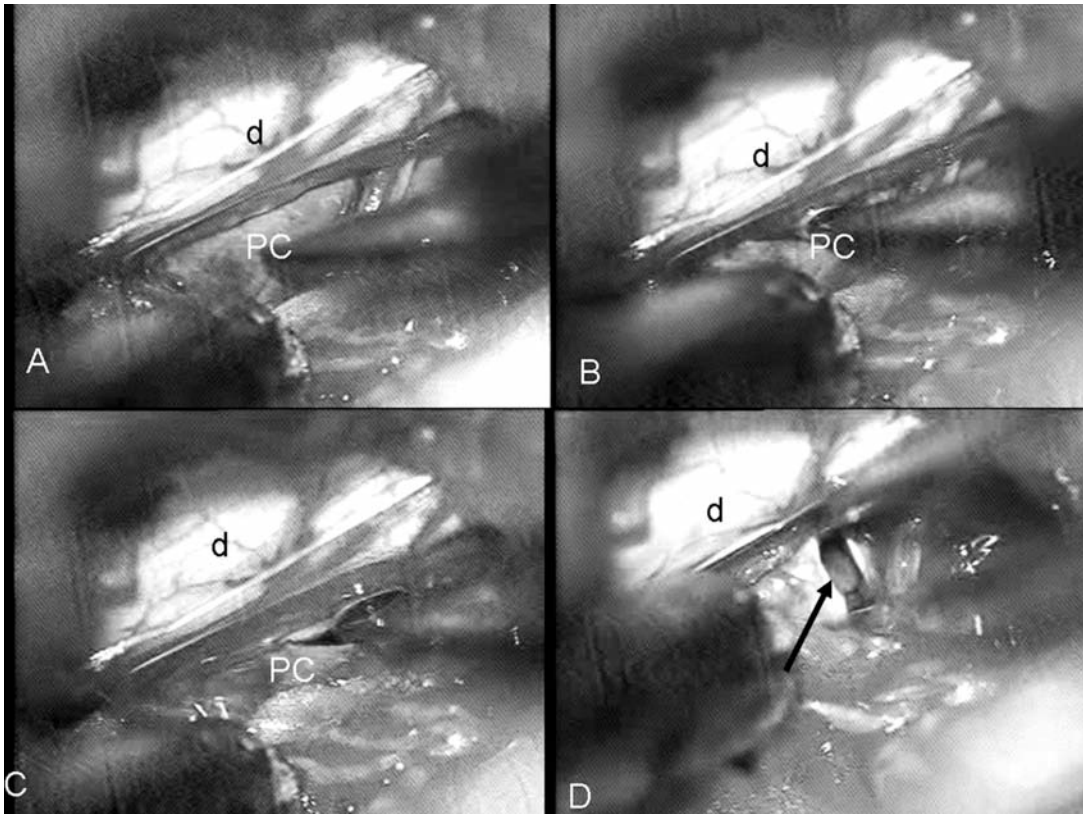
We approached the lesion through left L4 lamina fenestration with flavectomy followed by subtotal removal of cyst wall (which was thin) with evacuation of its contain (CSF like) that decompressed the nerve root and thecal sac. Post operative histopathology reported perineural cyst (Figure-2.a-d). Post operatively patient recovered uneventfully and was symptom free for 1.5 year after operation.

## DISCUSSION:

Also known as Tarlov cysts<sup>(5)</sup>, are cerebrospinal-fluid-filled (CSF) sacs located in the spinal canal of the S1-to-S4 region, of the spinal cord, and can be distinguished from other meningeal cysts by their nerve-fiber-filled walls.



**Figure-1.** Preoperative MRI of lumbosacral spine. **a.** Axial T1W image showing perineural cyst (arrow marked). **b.** Saggital T2W image showing the perineural cyst (arrow marked).



**Figure-2.** Peroperative pictures (d:dura mater, pc:perineural cyst). **a-b.** Intact cyst, **c.** Incision given on the cyst wall. **d.** After opening of cyst and evacuation of content, inside was seen (arrow marked).

Tarlov cysts are defined as cysts formed within the nerve-root sheath at the dorsal root ganglion<sup>(2)</sup>. The etiology of these cysts is not well understood. Tarlov cysts are considered Type II lesions, being defined as extradural meningeal cysts with nerve fibers<sup>(8)</sup>.

Walls of Tarlov cysts are thin and fibrous; they are prone to rupture if touched, making surgery difficult. The nerve fibers embedded in the walls of the cysts<sup>(1)</sup>. Histological examination reveals the Tarlov-cyst outer wall is composed of vascular connective tissue and the inner wall is lined with flattened arachnoid tissue. In addition, part of the lining containing nerve fibers also occasionally contains ganglion cells<sup>(9)</sup>.

Perineural cysts are located in the S1 and S4 region of the spinal cord. They usually form on

the extradural components of sacrococcygeal nerve roots at the junction of dorsal root ganglion and posterior nerve roots and arise between the endoneurium and perineurium<sup>(3)</sup>. Occasionally, these cysts are observed in the other parts of spine<sup>(9)</sup>. However, these cysts most commonly arise at the S2 or S3 junction of the dorsal nerve root ganglion<sup>(4,10)</sup>. The cysts are often multiple, extending around the circumference of the nerve, and can enlarge over time to compress neighboring nerve roots, to cause bone erosion<sup>(14)</sup>.

There are several hypotheses proposed regarding the formation of Tarlov cysts, including: inflammation within the nerve root cysts followed by inoculation of fluids, developmental or congenital origin, arachnoidal

proliferation along and around the exiting nerve root, and breakage of venous drainage in the perineuria and epineurium secondary to hemosiderin deposition after trauma<sup>(3)</sup>. Tarlov himself theorized that the perineurial cysts form as a result of blockage of venous drainage in the perineurium and epineurium secondary to hemosiderin deposition, after local trauma<sup>(12,14)</sup>. Another theory gaining increasing popularity, over the past decade, is one postulated by Fortuna et al.; it described perineurial cysts to be the results of congenital arachnoidal proliferation along the exiting sacral nerve roots<sup>(11)</sup>. The cause of these cysts is still unknown, and the proposed theories have not been tested or challenged.

Tarlov cysts are known to have the tendency to enlarge over time. The prominent theory that explains this phenomenon reasons the enlargement of the cysts is due to the cerebrospinal fluid being pushed into the cyst during systole pulsation, but unable to get out during the diastole phase, resulting in enlargement over time<sup>(11)</sup>.

Tarlov cysts are relatively common when compared to other neurological cysts, but they are usually asymptomatic. These cysts are often detected incidentally during MRI or CT scans for other medical conditions. Cysts with diameters of over 1.5 cm (0.6 in) are more likely to be symptomatic; Back pain, perineal pain, Sciatica, Cauda equina syndrome, dysuria, urinary incontinence, coccygodynia, sacral radiculopathy, radicular pain, headaches, retrograde ejaculation, paresthesia, hypesthesia, motor disorders in lower limbs and the genital, perineal, or lumbosacral areas, sacral or buttocks pain, vaginal or penile paraesthesia, sensory changes over buttocks, perineal area, and lower extremity; difficulty walking; severe lower abdominal pain are the reported symptoms in case of symptomatic Tarlov cyst<sup>(7,9-11,14)</sup>.

There is no consensus on the optimal treatment of symptomatic perineurial cysts. There are a few treatments available for alleviating the symptoms caused by these cysts, but their effectiveness is debatable. It had been reported that a positive filling defect and larger cyst size (>1.5 cm or 0.6 inch) is a good indicator for successful treatment outcome<sup>(1,3,11)</sup>. 75 Although fibrin-glue therapy had been proven to be a promising therapy in the treatment of these cysts, there have been cases of the fibrin seeping back up into the spine, affecting other nerves. Risk of surgical treatment include neurological deficits, infection and inflammation, spinal headache, urinary disturbances, and leakage of cerebrospinal fluids<sup>(11)</sup>.

Surgical treatment should be considered if all other symptom-relieving options have been exhausted. No current treatment so far has proven to be effective due to the unclear pathogenesis and pathophysiology of Tarlov cysts but microsurgical excision is preferable<sup>(11)</sup>.

Current treatment options include CSF aspiration, complete or partial removal, fibrin-glue therapy, amongst other surgical treatment approaches<sup>(11)</sup>.

Perineural cysts is very rare cause, but should be considered as an important cause of radiculopathy

## REFERENCES:

1. Donlin Long. The Johns Hopkins Hospital Dept. of Neurosurgery, interviewed by Hsuan Chen, Oct. 6th, 2009.
2. Goyal RN, Russell NA, Benoit BG, Belanger JM. Intraspinal cysts: a classification and literature review. *Spine* 1987; 12: 209-213.
3. Guo DS, Shu K, Chen RD, Ke CS, Zhu YC, Lei T. Microsurgical treatment of symptomatic sacral perineurial cysts. *Neurosurgery* 2007; 60(6): 1059-1065.

4. Hefti M, Landolt H. Presacral mass consisting of a meningocele and a Tarlov cyst: successful surgical treatment based on pathogenic hypothesis. *Acta Neurochirurgica* 2006; 148(4): 479-483.
5. Ju CI, Shin H, Kim SW, Kim HS. Sacral perineural cyst accompanying disc herniation. *J Korean Neurosurg Soc* 2009; 45 (3): 185-187.
6. Langdown AJ, Grundy JR, Birch NC. The clinical relevance of Tarlov cysts. *J Spinal Disord Tech* 2005; 18: 29-33.
7. Moldes MR, Rodriguez-Losada JS, Garcia DL, Agudo VC, Pais JM, Martin MG. Tarlov Cyst and Symptomatic Bladder Dysfunction. *Actas Urologicas Espanolas* 2008; 32(10): 1035-1036.
8. Nabors MW, Pait TG, Byrd EB, Karim NO, Davis DO, Kobrine AI and Rizzoli HV. Updated Assessment and Current Classification of Spinal Meningeal cysts. *J Neurosurg* 1988; 68: 366-377.
9. Nadler SF, Bartoli LM, Stitik TP, Chen BQ. Tarlov cyst as a rare cause of S1 radiculopathy: A case report. *Arch Physical Med Rehab* 2001; 82(5): 689-690.
10. Singh PK, Singh VK, Azam A, Gupta S. Tarlov Cyst and Infertility. *J Spinal Cord Med* 2009; 32(2): 191-197.
11. Tao Z, Zhenhua L, Weiming G, Bingwei S, Shuheng L, Kai Z, Dezhen Y, Peng X, Tanghong J. Percutaneous fibrin glue therapy for meningeal cysts of the sacral spine with or without aspiration of the cerebrospinal fluid. *J Neurosurg Spine* 2007; 7: 145-150.
12. Tanaka M, Nakahara S, Ito Y, Nakinishi K, Sugimoto Y, Ikuma H, Ozaki T. Surgical results of sacral perineural (Tarlov) cysts. *Acta Medica Okayama* 2006; 60(1): 65-70.
13. Tarlov IM. Perineural cysts of the spinal root. *Arch Neurol Psychiatry* 1938; 40: 1067-1074.
14. Tarlov IM. Spinal perineural and meningeal cysts. *J Neurol* 1970; 33: 10.