

Surgical Management of Symptomatic Tarlov Cyst: A Case Report

Abdul Naveed Khan¹, Zahra Saifuddin², Hassaan Bin Aqeel³, Haider Abbas Mandviwala², Zainab Aqeel Khan⁴

¹Associate Professor of Neurosurgery, Ziauddin Hospital, ²House Officer, Ziauddin University, ³House Officer, AO Hospital,

⁴Clinical Research Fellow, AO Hospital, Karachi, Pakistan.

ABSTRACT

We aim to present a case depicting the gradual onset of symptomatic sacral Tarlov cyst with complaints that include: low back pain, numbness, altered sensation, and inability to control bladder and bowel movements (incontinence). The patient under our care was treated by performing an operation that involved laminectomy and excision of the cyst.

Tarlov cysts are perineural dilations that are fluid-filled nerve root cysts most commonly found in the sacral region of the spine adjacent to the dorsal root ganglion. Tarlov cyst was first described in medical literature in 1938 and the etiology of the disease is unknown. Tarlov cysts are extremely rare with an incidence of around 5% and were found incidentally in our patient on magnetic resonance imaging as a hyper-intense lesion at the level of S1-S2. Other imaging tools can be used to diagnose Tarlov cysts like CT, MRI, CT myelogram however the gold standard is MRI.

Keywords: Tarlov cyst, Neurologic Deficit, Laminectomy, Urinary Incontinence, Back Pain.

Corresponding Author:

Dr. Haider Abbas

House Officer

Ziauddin Hospital,

Karachi, Pakistan

Email: haider9035@zu.edu.pk

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INTRODUCTION

Tarlov cysts also known as Nabors Type II spinal meningeal cysts and are perineural dilations that arise from the meninges of spinal nerve root sheaths adjacent to the dorsal root ganglion. These cysts are lined by the endoneurium and perineurium of the spinal nerve root and contain cerebrospinal fluid between them¹. These dilations do not communicate with the subarachnoid space². These cysts could be single or multiple and are mostly found on the spinal nerve root sheaths, usually sacral nerve roots S1-S4¹⁻⁴. They were first reported by Isadore M. Tarlov (1905–1970) during an autopsy being carried

out of the filum terminal in 1938²⁻⁵. The prevalence of these cysts accounts for 1.5-4.6%⁶. These perineural dilations are usually asymptomatic⁵⁻⁸, but depending on their size, location, and connection to the nerve roots, these cysts could produce symptoms in 20-30%⁸. In accordance with their relationship to the sacral nerve roots, the symptoms they produce include urinary, bowel, and sexual dysfunction, perineal and sacrococcygeal pain, radicular pain, headache, dyspareunia, back pain without sciatic^{1,4-6,8}.

Symptoms may aggravate when cerebrospinal fluid

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(CSF) pressure increases during walking, sitting, standing, and coughing¹. There are various surgical techniques for symptomatic Tarlov cysts⁷. Minimally invasive techniques include Lumbar CSF drainage^{1,9} and cyst aspiration under computed tomographic (CT) guidance with or without the instillation of fibrin glue¹⁰.

Procedures that are commonly performed, include shrinking the cyst with bipolar cauterization and completely excising the cyst along with the nerve root, and oversewing the cyst wall with or without the nerve root sleeve reconstruction^{5,11,12}. Neurosurgical procedures which are less commonly performed for symptomatic Tarlov cysts are decompressive laminectomy and a shunt placement between the cyst and subarachnoid space^{5,7,11,13-15}. Our main aim is to present a case report of one of the patients with a symptomatic Tarlov cyst to explain the surgical treatment.

CASE PRESENTATION

A 40 years old female, a mother of two, presented in the outpatient department (O.P.D) with a history of lower back pain for the past 5 years. She is a teacher by profession and also has a history of Hepatitis C for which she takes ribavirin.

The pain was gradual in onset and the severity of pain was moderate initially which was relieved with a Nonsteroidal anti-inflammatory drug (NSAID). The severity of the pain increased with time and it started interfering with her day-to-day activities including sleeping. For one year she developed neurological symptoms like radiating pain in her left lower limb with numbness and paraesthesia. She described the pain as a pinprick and continuous in nature. After a while, she experienced pain on rest and it was aggravated in the sitting position and did not relieve with postural changes. However, NSAIDs relieved the symptoms for a few hours. She also reported headaches and dizziness as association factors with the pain. Before surgery, the patient had mild symptoms of urinary and faecal incontinence for two months.

On examination, spinal tenderness was present. The straight leg raising was normal on both sides. There was no motor loss, but evidence of blunted sensation on the left side at S1 and S2 dermatome. Considering the above-mentioned symptoms an X-ray and magnetic resonance imaging (MRI) was suggested. The X-ray showed no abnormality or any bony changes as shown in Figure 1. The MRI showed a hyper-intense lesion at the level of S1-S2. The lesion appears to be a fluid-filled cyst in nature measuring about 2cm in diameter as illustrated in Figure 2.

After the investigations, the next course of action was a sacral laminectomy and excision of the cyst.

The cyst was excised and sent for histology and culture which confirmed that the cyst wall was showing nerve cells hence, proving it to be a Tarlov cyst. The patient felt immediate relief from pain after the operation. She did however develop left lower limb numbness for 15 days post-operatively which got better after physiotherapy. Her quality of life improved significantly and she was able to return to her social activities. She is experiencing pain while stair climbing occasionally.

DISCUSSION

Tarlov cysts are described as perineural cysts which were reported from the Montreal Neurological Institute during the dissection of 30 cadaveric filum terminal back in 1938. The prevalence of Tarlov cysts has increased in older studies perhaps because of the breakthrough in imaging techniques like MRI, CT scans, and myelography which allow a more accurate study of the spinal nerve roots. Tarlov cysts have a female predominance which becomes symptomatic between 31 to 60 years of age¹⁶. Although Lucantoni et al. reported in their study that the incidence does not significantly differ between sexes. However, the sample size was relatively very small (27 patients) in their case series 17. We also reported the Tarlov cyst in a female patient with a chronic history of low back pain and no definitive diagnosis for a long time. Tarlov cysts usually impact the extradural portion of the sacral nerves and lead to sensory symptoms as the cyst is near the dorsal root and ganglion. Sometimes when they are of bigger sizes, they can cause motor symptoms as they compress the ventral root hence causing motor deficits¹⁸. Patients usually present with symptoms of lower back pain, lower urinary tract symptoms, neurogenic claudication, and sciatic and perineal pain¹⁸. Tarlov cysts are also rarely present with fecal incontinence. As reported in our case, the patient had fecal and urinary incontinence for the past two months, with all other classical symptoms of the Tarlov cyst already reported in the previous studies.

Considering the advanced neurological investigations¹⁴, Tarlov cysts are detected by imaging tools such as CT, MRI, CT myelogram, and delayed myelogram. The modality of imaging considered as the gold standard for Tarlov cysts is MRI. This is perhaps because MRI allows the evaluation of the delicate relationship between parent nerve roots and the cysts with immaculate precision. Another investigative modality used is Computed tomography (CT) which was used in many patients and illustrated cysts expansion and the effects it has on sacral bone erosion⁷. Despite all these radiological tools, the final diagnosis of Tarlov cysts is a histopathological one rather than a radiological one². On MRI, it appears as a fluid-filled cystic lesion, showing a high signal on T2 weighted image while showing a low signal on T1 weighted image. Plain Radio-

graphs rarely show bony erosion of the spinal canal or neural foramina. In order, to detect the communication of the cyst with subarachnoid space an invasive modality for imaging called Myelography may be used¹⁷. Our patient's X-ray showed no abnormality or bony changes while the MRI showed a cystic lesion which was 2-3 cm in diameter at the level of the second sacral vertebra that clearly showed compression on the root. Therefore, we did not investigate more.

An author from one of the studies states that patient that has Tarlov cysts that are larger than 1.5cm and with radicular pain, band bowel/bladder dysfunction are the ones that benefit most from surgery. Acosta FL et al. recommended that patients that present with radicular pain that refers to the location of the cysts should undergo conservative management with anti-inflammatory drugs and physical therapy. Surgical procedures should be kept as an option for those patients that do not benefit from conservative management. One finding of Acosta et al. is that those patients whose symptoms increase with postural changes or Valsalva maneuvers are the ones to also benefit most from surgery². Until the early 2000s, there was no proper protocol that was followed in the management and treatment of Tarlov cysts that presented as symptomatic sacral cysts. The options available at that time were simple bony decompression, cyst and nerve root resection, incision and drainage of cysts, lumboperitoneal cerebrospinal fluid shunting, and lastly obliteration of the communication between the cyst with the Dural sac. Successful results have been reported along with the surgical failures, to this day the treatment and management of Arlov cysts remains a challenge for neurosurgeons¹⁴.

In recent times there are now various options available for the operative management of symptomatic Tarlov cysts. Non-invasive techniques such as CSF drainage through lumboperitoneal (LP) have shown improvement in symptoms however the symptoms reappear once the drainage is stopped¹⁵. Bartels et al. reported that CSF drainage through an LP shunt is a useful method to establish a definite diagnosis with temporary symptomatic relief¹⁵. Especially, in patients that present with underlying spinal canal stenosis or disc protrusion, improvement of symptoms after a CSF is indicative of a Tarlov cyst. It has been reported that permanent CSF drainage via LP shunt has proven to be effective⁹. One other method used in 1997 by Patel et al. was the application of fibrin glue as a method of sealing Dural leaks to a CT-guided percutaneous procedure. It was delivered directly into a saral meningeal cyst. Within 30 to 90 minutes the bonding strength of fibrin glue becomes maximum. It also provides firm tissue adhesion. Promotes wound healing and it dissolves gradually or is resorbed by fibrinolysis and may be

followed by subsequent fibrosis. The procedure used by Patel et al. resulted in marked symptomatic improvement with no evidence of recurrence. It is thought that fibrin glue placement permanently seals the communication between the cyst and the sub-arachnoid space as compared to aspiration²⁰. Percutaneous drainage is another non-invasive and non-surgical method for symptomatic pain relief however symptoms reappear as the cyst reforms as reported previously¹⁹. Aseptic meningitis is the most reported complication of this procedure, therefore it is not favored by the authors^{20,21}. Surgical techniques used for symptomatic relief of cysts were complete removal of the cyst along with excision of the -posterior root ganglion the cysts affect^{2,23}. However, there were neurological defects after this procedure which resulted in morbidity thus it is not a popular technique used, especially in cases of bilateral sacral cysts^{9,22}. In our patient with a Tarlov cyst, we performed a sacral laminectomy with complete excision of the cyst. The patient felt immediate relief from pain after the operation. However, the patient developed left lower limb numbness which got better within 15 days after physiotherapy and rest⁷. We recommend case series or even experimental studies with long-term follow-up to explore more about the symptoms, causes, and management of the Tarlov cyst, especially on the nerve root with neurological deficits.

CONCLUSION

Tarlov cyst is rare but could be one of the causative factors of lower back aches. It must be considered when a patient presents with radicular symptoms. Laminectomy can be considered a viable option for the management of such rare cysts.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

PATIENT CONSENT

Consent was taken from the patient before writing the case report.

AUTHORS' CONTRIBUTION

ANK Introduction, ZS Discussion, HBA Case report, HAM Discussion and correspondence, ZAK Abstract and review

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