Giant Lumbosacral Tarlov Cyst With Extensive Presacral Extension: A Case Report And Review Of Literature

Mukhtar M. Shanqiti, BSc[1], Ahmed A. Alrehaili, MSc[1], Atif M. A. Osman, MD, FRCR[1], Aseel N. Alalawi, BSc[2]

[1]Department of Radiology, Madinah General Hospital, King Salman bin Abdulaziz Medical City, Medina, Saudi Arabia
[2]Department of diagnosis radiology science, College of applied medical science, Taibah University, Medina, Saudi Arabia

Abstract
Background: Tarlov cysts, or perineural cysts, are rare cerebrospinal fluid (CSF)-filled lesions most often found in the sacral region. Although frequently incidental, large or multiloculated cysts can cause mass effect or neurological symptoms. Recent analyses describe symptomatology and interventional decision-making in symptomatic cases.
Case Presentation: A 42-year-old male presented with a one-year history of dysuria and urinary frequency, followed by acute low back pain. CT imaging revealed large bilateral perisacral multiloculated cystic lesions with spinal canal extension. MRI confirmed a giant lumbosacral Tarlov cyst (11 × 9 cm) with multiple lumbar perineural cysts. The patient remained neurologically intact and was managed conservatively. Follow-up MRI after seven months showed stable cyst morphology without new findings. Recent case reports support effectiveness of tailored non-operative management in select patients.
Conclusion: This case highlights the imaging features and natural course of a lumbosacral Tarlov cyst managed conservatively, emphasizing the importance of individualized management guided by clinical presentation and neurological findings.
Keywords: Tarlov cyst, perineural cyst, lumbosacral spine, MRI, presacral lesion, conservative management.

INTRODUCTION

Tarlov cysts (perineural cysts) are rare nerve root sheath dilatations first described by Isadore Tarlov in 1938. They contain cerebrospinal fluid and are most commonly located at the sacral level, with reported prevalence ranging from 1.5% to 13% on MRI studies (1). The pathogenesis remains uncertain, though hypotheses include congenital arachnoidal proliferation, CSF pressure fluctuations, or trauma-related meningeal diverticula formation (2).
They are incidentally found in asymptomatic patients as well as in those with back pain, radiculopathy, and bladder dysfunction. The majority of them are asymptomatic, but because of their connection to the sacral roots, they have also been linked to a number of symptoms, including sacrococcygeal discomfort, radicular, perineal, urogenital, bladder, and ejaculation abnormalities, as well as radicular pain and paresthesia. Management strategies range from observation to percutaneous drainage or microsurgical excision, but optimal treatment remains controversial with variable outcomes (2).

A case of a male patient with urogenital and radicular pain secondary to a sacral Tarlov cyst who underwent conservative treatment is presented in this study.

Case Presentation

A 42-year-old male presented on 1 January 2024 with a one-year history of dysuria and urinary frequency, followed by acute low back pain. He was scheduled for further urological evaluation. On 7 January 2024, he presented to the emergency department with sudden-onset low back pain, aggravated by movement and sitting and relieved by supine position. Clinical examination revealed that the patient was oriented, vitally stable, and neurologically intact with preserved motor and sensory functions. No bowel or bladder incontinence was present.

CT imaging for abdomen and pelvis performed at 7 January 2024 revealed no renal or ureteric calculi but demonstrated bilateral multiloculated presacral cystic lesions with mass effect on the rectum and extension into the sacral spinal canal, raising suspicion for perineural (Tarlov) cysts as shown in figure (1). These imaging features warranted further evaluation with MRI. Contrast-enhanced lumbosacral MRI was made at 20 April 2025 revealed a giant multiloculated presacral cyst (11 × 9 cm) extending through sacral foramina and neural foramina at L4–L5 and L5–S1, consistent with Tarlov cyst morphology (CSF-like signal, no enhancing solid components). Multiple smaller perineural cysts were seen from L1 to sacrum as shown in figure (2). Mild lumbar degenerative changes were noted without significant nerve impingement. No post-contrast enhancement or solid components were observed. This imaging pattern matches previously described giant cysts with unusual pelvic extension on MRI. Tarlov cysts with intrapelvic extension have been documented, with emphasis on MRI follow-up for growth assessment.

Figure 1 CT image showing Tarlov Cyst

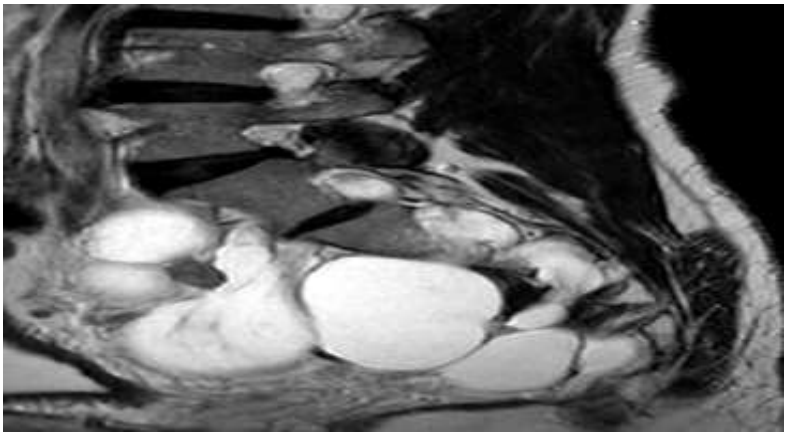

Figure 2 Sagittal T2 MRI Showing giant multiloculated presacral cyst (11 × 9 cm) extending through sacral foramina and neural foramina at L4–L5 and L5–S1, consistent with Tarlov cyst morphology

In the absence of neurological deficits, a conservative management strategy was adopted. The patient was advised to continue physiotherapy for symptomatic lumbar discomfort, maintain analgesia as needed, and undergo serial MRI to monitor cyst stability.

Follow-up MRI shown in figure 3 was performed on 13 November 2025 demonstrated stable lobulated lumbosacral perineural cysts with persistent sacral foraminal widening and presacral extension encasing pelvic structures. There was no enhancement, hemorrhage, rupture, or new denervation as shown in figure 4. The smaller perineural cysts remained unchanged. Incidental mild bladder wall thickening was noted. This imaging stability aligns with reports describing variable clinical courses, where many cysts do not progress radiologically despite compressive appearances.

At 7-month follow-up, the patient remained neurologically intact and clinically stable, with intermittent low back discomfort managed conservatively. Continued observation was recommended.

Figure 3 Follow up Axial Pelvic MRI showing giant mutiloculated Tarlov Cyst

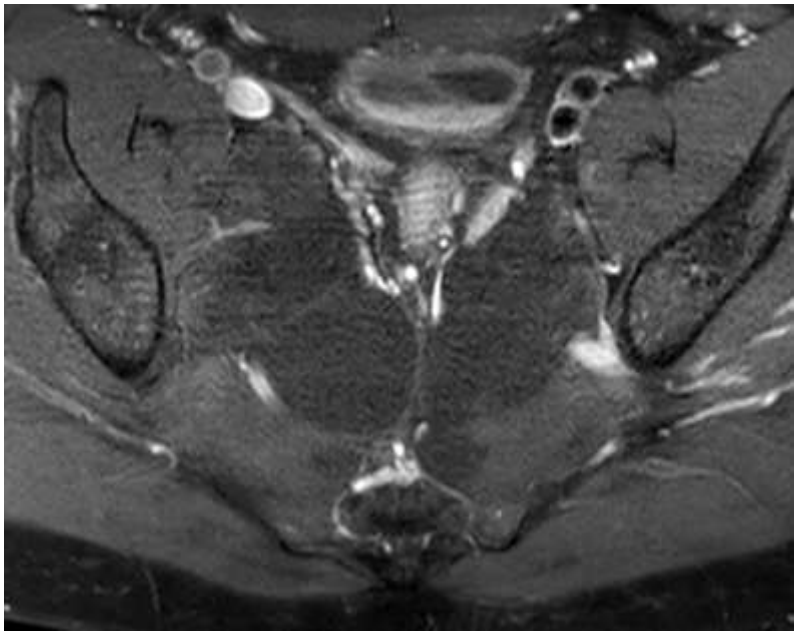

Figure 4 Contrast Enhanced MRI Showing No Enhancement in the Tarlov Cyst

DISCUSSION

Following an anatomic investigation of the cauda equina in thirty cadavers, Tarlov cyst was first characterized in 1938. According to his description, the cysts had roots either within or on their wall and were situated in the perineural region at the intersection of the ganglion and the posterior root. They experienced late filling on a myelogram because they were unable to freely communicate with the subarachnoid space. Tarlov distinguished them from meningeal diverticula, which have wide connection with the subarachnoid space, arise distal to the ganglion, and lack roots (3). These cysts can mimic other presacral pathologies such as meningocele or epidermoid cysts. Tarlov cysts are more common in women and cause symptoms in about 16% of cases, according to a meta-analysis of 13,266 patients (4).

These cysts' precise cause is still unknown. According to one theory, they could be caused by trauma that results in subarachnoid hemorrhage. This hemorrhage might obstruct the perineurium and epineurium veins' discharge, which causes them to burst and develop into cysts. A prenatal origin is suggested by another idea, in which aberrant root sleeve growths impede normal CSF flow. A "ball valve" mechanism, in which CSF enters the cyst but is prevented from exiting, may also contribute to the creation of cysts. Histological analysis usually reveals an inner wall lined with flattened arachnoid cells, occasionally including nerve fibers and ganglion cells, and an outside wall of vascular connective tissue (5).

Most of Tarlov cysts are asymptomatic, usually detected as incidental findings on MRI, while symptomatic Tarlov cysts seem to be rare. Lumbosacral, radicular, perineal, and urogenital pain, coccydynia, urine dysfunction (voiding urgency and increased frequency), and intestinal dysfunction are symptoms associated with Tarlov cysts (6,7). Most prevalent urodynamic problem is the feeling of early bladder filling (6). Symptoms mostly related to posture (up to 74%) (4), improving in the supine position, and worsening when sitting and with Valsalva maneuvers (8,9). These phenomena are present in the reported case. Over time, 22% of Tarlov cysts will exhibit symptoms (4) and a valve mechanism in the cyst's neck is believed to be the source of the beginning of symptoms, which would result in an increase in cyst pressure and growth (10). This would explain why Tarlov cysts are more common as people age. Sacral, particularly S2 is the most common region, and S2–S4 roots are typically affected. Sensitive roots used to be more impacted than motor roots because of their placement (4).

Because Tarlov cysts are filled with CSF and exhibit a low signal on T1 and a high signal on T2, lumbosacral MRI is thought to be the preferred imaging test for finding these cysts. MRI demonstrating CSF-equivalent signal intensity on all sequences, possible bone remodeling, and absence of enhancement. MRI remains essential for characterizing perineural cysts and identifying features such as multiloculation and pelvic extension (11). In our case, the MRI findings closely matched those previously reported for giant perineural cysts extending into the presacral space. A CT myelogram can be used as a substitute for MRI in order to identify perineurial cysts. These cysts appear as isodense with CSF on CT scans, either with or without intrathecal contrast, and frequently result in abnormalities in the bones. Cyst communication with the spinal subarachnoid space and surrounding bone scalloping can be clearly seen on post-myelography CT imaging (10). MRI has better tissue resolution, multiplanar images, and noninvasiveness than CT. The sacral roots should be the focus of neurophysiological investigations,

which typically reveal changes in the Hoffmann reflex, the anus-anal reflex, and a delay in F waves (12). The gastrocnemius, the intrinsic foot muscles innervated by the tibialis, and the sural nerve should all be studied (12).

Once the diagnosis is established, different treatments have been proposed. Institutional retrospective experience suggests a substantial proportion of symptomatic cyst patients may initially be managed non-surgically; intervention is individualized (2). Methods such as CT-guided aspiration with or without fibrin glue and surgical cyst fenestration have been used in refractory cases, although outcomes vary and procedural selection remains debated (1). Recent reports continue to explore interventional options and their clinical utility alongside conservative approaches. Interventional and surgical approaches are considered for refractory symptoms or neurological deterioration; recent practice reflects evolving strategies (2). A case report documented a 12-year MRI follow-up of a giant Tarlov cyst with intrapelvic extension, demonstrating stability without intervention, supporting long-term conservative observation (11).

Our presented case demonstrates that even large Tarlov cysts with significant presacral extension may remain clinically and radiologically stable under non-operative care when neurological function is intact. Conservative management is a valid option in neurologically intact patients, with periodic imaging to monitor stability (2). This supports a tailored, symptom-based management paradigm rather than relying solely on lesion size or anatomical extent.

Across recent literature, outcomes consistently support that conservative management is effective for stable, neurologically intact patients with Tarlov cysts. Common conservative treatments reported include: Epidural steroid injections that used for reducing inflammation around nerve roots and reported to improve symptoms in small cysts (13). Oral corticosteroids, successful in select cervical perineural cyst cases (14). Physical therapy (focusing on McKenzie exercises, pelvic stabilizer and abdominal strengthening, and hamstring stretching)/ multimodal rehabilitation – biofeedback, nerve stimulation, radiofrequency and pharmacologic agents to reduce pain and strengthen musculature (15). Watchful waiting / non-steroidal anti-inflammatory drugs/ pain management may be used initially in mild cases (16). Intervention is reserved for cases with progressive symptoms or neurological deficits (1,2,11,13).

Below is a table (1) summarizing key literature on conservative management of symptomatic Tarlov cysts (focused on cases/series where conservative measures were reported). Because formal large trials are lacking, most evidence comes from case reports, small case series, and observational studies that include conservative approaches such as steroids, physical therapy, multimodal rehab, and symptom-based management (13).

Table 1: A literature review of conservative treatment of Tarlov cysts.

Authors / Year	No. of Patients	Location of Cyst	Symptoms	MRI Findings	Conservative Treatment	Conclusions
Muthu & Chandrasekaran (2023) (13)	1 (case report)	Sacral, S2 root	Severe inner thigh & gluteal pain; sensory loss S2–	Single Tarlov cyst ~1.3 × 0.7 cm; hypoint	Epidural steroid injection (after failed pain	Epidural steroid relieved symptoms; conservative

			S3; no motor deficits	ense T1, hyperintense T2	meds/physio)	management can be successful for small cysts without motor symptoms.
Stamiris et al. (2024) (14)	1 (case report)	Cervical C6-C7 and C7-T1	Neck/arm pain, paraesthesia, mild weakness	Two cervical perineural cysts on MRI	14-day oral corticosteroids + soft collar + activity restriction	Conservative approach led to significant symptom reduction and full recovery.
Mitra et al. (2008) (17)	2 (case series)	Lumbar & Cervical	Radicular pain	Perineural cysts on imaging	Oral steroids and epidural steroid therapy	Steroid therapy may offer a nonsurgical alternative.
Fernández-Cuadros et al. (2024) (15)	5 (retrospective)	Sacral S1–S3	Pain, pelvic pain, incontinence, dyspareunia	Sacral Tarlov cysts on MRI	Multimodal rehabilitation (biofeedback + PT + radiofrequency) + pharmacologic (e.g., acetazolamide)	Multimodal conservative therapy decreased pain and improved muscle strength; supports conservative rehab protocols.
Zibis et al. (2015) (16)	1 (case report)	Cervical	Radicular arm pain & numbness	Cervical perineural cyst on MRI	NSAIDs initially, then oral steroids	Relief of symptoms with conservative (steroid) approach; highlights possible nonsurgical management.

Devkota et al. (2024) (18)	1 (case report)	Sacral	Radiculopathy symptoms	Sacral perineural cyst	Conservative (pain management, watchful waiting)	Conservative management is preferred for asymptomatic cases.

CONCLUSIONS

Giant multiloculated Tarlov cysts with extensive presacral and foraminal involvement can be managed conservatively in neurologically intact patients, with close clinical and imaging follow-up. Decisions should be individualized based on symptom severity, neurological examination, and patient preferences.

Acknowledgments
The authors thank the radiology and spine teams involved in patient care.

Conflict of Interest
None declared.

Funding
No funding received.

Patient Consent
Written informed consent obtained from the patient for publication of this case report and images.

References

1. Baig F, Ain QU, Fatimah A, Ansari A, Qadeer U, Mansoor A. Clinical findings of Tarlov cyst according to its location and level in lumbosacral spine on magnetic resonance imaging. Journal of Health and Rehabilitation Research. 2023;3(2):1–5.
2. Tracz J, Judy BF, Jiang KJ, Caraway CA, Yang W, De Macena Sobreira NL, et al. Interventional approaches to symptomatic Tarlov cysts: a 15-year institutional experience. J Neurointerv Surg. 2023/07/05. 2024;16(7):737–41.
3. Tarlov IM. Perineurial cysts of the spinal nerve roots. Arch Neurol Psychiatry. 1938;40(6):1067–74.
4. Klepinowski T, Orbik W, Sagan L. Global incidence of spinal perineural Tarlov's cysts and their morphological characteristics: a meta-analysis of 13,266 subjects. Surg Radiol Anat. 2021/01/17. 2021;43(6):855–63.
5. Nadler SF, Bartoli LM, Stitik TP, Chen B. Tarlov cyst as a rare cause of S1 radiculopathy: A case report. Arch Phys Med Rehabil. 2001/05/11. 2001;82(5):689–90.
6. Hulens M, Rasschaert R, Bruyninckx F, Dankaerts W, Stalmans I, De Mulder P, et al. Symptomatic Tarlov cysts are often overlooked: ten reasons why-a narrative review. Eur Spine J. 2019/05/13. 2019;28(10):2237–48.
7. Baker M, Wilson M, Wallach S. Urogenital symptoms in women with Tarlov cysts. J Obstet Gynaecol Res. 2018/07/06. 2018;44(9):1817–23.
8. Lim VM, Khanna R, Kalinkin O, Castellanos ME, Hibner M. Evaluating the discordant relationship between Tarlov cysts and symptoms of pudendal neuralgia. Am J Obstet Gynecol. 2019/07/19. 2020;222(1):70.e1-70.e6.
9. Elkins N, Hunt J, Scott KM. Neurogenic Pelvic Pain. Phys Med Rehabil Clin N Am. 2017/07/06. 2017;28(3):551–69.

10. Kameda-Smith MM, Fathalla Z, Ibrahim N, Astaneh B, Farrokhyar F. A systematic review of the efficacy of surgical intervention in the management of symptomatic Tarlov cysts: a meta-analysis. Br J Neurosurg. 2021/03/24. 2024;38(1):49–60.
11. Kaptanoğlu E, Malçok Ü A, Kaptanoğlu D, Çatav S. Growth rate of a giant Tarlov (perineural) cyst with intrapelvic extension. Eur Spine J. 2024/07/23. 2024;33(11):4362–7.
12. Hulens M, Bruyninckx F, Dankaerts W, Vansant G, De Mulder PA. Electromyographic Abnormalities Associated with Symptomatic Sacral Tarlov Cysts. Pain Pract. 2016/03/10. 2016;16(5):E81-8.
13. Muthu S, Chandrasekaran S. Conservative Management of Symptomatic Sacral Tarlov Cyst - A Rare Case Report. J Orthop Case Rep. 2023/07/03. 2023;13(6):57–60.
14. Stamiris S, Karampalis C, Stamiris D, Anestiadou E, Christodoulou P. Successful Conservative Management of a Patient With Symptomatic Cervical Perineural Cysts: A Case Report. Cureus. 2024/06/10. 2024;16(5):e59902.
15. Fernández-Cuadros ME, Martín-Martín LM, Pérez-Moro OS, Albaladejo-Florín MJ. Symptomatic Tarlov cysts: A case series and effectiveness of multimodal rehabilitation plus pharmacological treatment. Neurology Perspectives. 2024;4(2):100145.
16. Zibis AH, Fyllos AH, Arvanitis DL. Symptomatic cervical perineural (Tarlov) cyst: a case report. Hippokratia. 2015;19(1):76.
17. Mitra R, Kirpalani D, Wedemeyer M. Conservative management of perineural cysts. Spine (Phila Pa 1976). 2008/07/17. 2008;33(16):E565-8.
18. Devkota S, Adhikari S, Lamichhane S, Koirala B, Sarmast AH. Uncommon cause of radiculopathy: A case of symptomatic Tarlov cyst in an elderly female and literature review. Clin Case Rep. 2024;12(7):e9189.