

CASE REPORT

Low Back Pain with a “Crowning Sensation”: A Case of a Sacral Tarlov Cyst Coexisting with Lumbar Intervertebral Disc Herniation

MOHD ARIFF SHARIFUDIN^{1,2,3*}, SITI AISHAH AHMAD MAULANA^{1,4}, MAI NURUL ASHIKIN
TAIB¹, MOHAMAD ZAKWAN HELMI ABU BAKAR³, UMMU HABIBAH SULAIMAN⁴

¹Faculty of Medicine, Universiti Sultan Zainal Abidin, Jalan Sultan Mahmud, 20400 Kuala Terengganu, Terengganu, Malaysia

²Medical and Healthcare Research Cluster, Office of The Deputy Vice-Chancellor (Research and Innovation), Universiti Sultan Zainal Abidin, 21300 Kuala Nerus, Terengganu, Malaysia

³Department of Orthopaedics, Hospital Sultan Zainal Abidin, Universiti Sultan Zainal Abidin, 21300 Kuala Nerus, Terengganu, Malaysia

⁴Department of Medical Imaging, Hospital Sultan Zainal Abidin, Universiti Sultan Zainal Abidin, 21300 Kuala Nerus, Terengganu, Malaysia

*Correspondence: ariffsharifudin@unisza.edu.my; dr.ariff.s@gmail.com; Tel: +609-6275630/ +6019-3352499

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ABSTRAK

Sista Tarlov sering kali merupakan penemuan rawak pada pengimejan tulang belakang tetapi boleh menyebabkan gejala atipikal yang menyerupai atau wujud bersama gangguan tulang belakang lazim, sehingga mencetuskan cabaran diagnostik. Seorang wanita berusia 48 tahun hadir dengan sejarah sakit belakang bawah yang semakin teruk selama enam bulan, dengan rasa sakit menjalar ke punggung dan paha belakang. Pengurusan awal bagi suspek herniasi cakera lumbar hanya memberikan kelegaan separa. Yang penting, beliau melaporkan sensasi “pengucupan” yang tersendiri - perasaan tekanan dan kenyang di perineum seakan-akan proses kelahiran - yang semakin teruk ketika duduk. Pencitraan resonans magnet (MRI) lumbosakral mendedahkan patologi berganda: penonjolan cakera ringan di peringkat L3/L4 dan sista Tarlov bersaiz 12 x 8 mm di peringkat S2. Sakit radikular dikaitkan dengan patologi cakera, manakala sensasi pengucupan menunjukkan mampatan saraf akar S2-S4 daripada sista tersebut. Konsensus pasukan multidisiplin mencadangkan pengurusan konservatif yang dioptimumkan dengan ubat neuromodulator, fisioterapi disasarkan, dan kaunseling gaya hidup ergonomik untuk meminimumkan duduk berpanjangan. Pada susulan setahun, sakit radikularnya bertambah baik dengan ketara, dan sensasi pengucupan dapat dikawal dengan baik, hanya muncul seketika ketika duduk terlalu lama. Sensasi pengucupan merupakan petanda khusus bagi patologi sakrum. Walaupun hubungan kausal pasti sukar dibuktikan, kekhususan tinggi sensasi ini untuk mampatan saraf akar sakrum menunjukkan bahawa sista Tarlov adalah punca paling mungkin. Kes ini menekankan kepentingan mempertimbangkan sista Tarlov dalam kalangan pesakit dengan sakit belakang bawah berterusan dan gejala pelvis atipikal. MRI lumbosakral adalah penting untuk mengenal pasti patologi berganda seperti ini, sekaligus membolehkan pengurusan konservatif efektif dan tersuai serta mengelakkan pembedahan berisiko tinggi yang tidak diperlukan.

Kata kunci: Pencitraan resonans magnet; sakit belakang bawah; sensasi pengucupan; sista perineural; sista Tarlov

ABSTRACT

Tarlov cysts are often incidental findings on spinal imaging but can cause atypical symptoms that mimic or coexist with common spinal disorders, posing a diagnostic challenge. A 48-year-old female presented with six months of worsening low back pain radiating to the buttocks and posterior thighs. Initial management for a suspected lumbar disc herniation provided only partial relief. Crucially, she reported a distinctive “crowning sensation” - a feeling of perineal pressure and fullness akin to childbirth—exacerbated by sitting. Lumbosacral magnetic resonance imaging (MRI) revealed a dual pathology: a mild L3/L4 disc protrusion and a 12 x 8 mm Tarlov cyst at S2. The radicular pain was attributed to the disc, while the crowning sensation was highly suggestive of S2-S4 nerve root compression from the cyst. A multidisciplinary team consensus recommended optimised conservative management with neuromodulatory medications, targeted physiotherapy, and ergonomic lifestyle counselling to minimise prolonged sitting. At one-year follow-up, her radicular pain improved significantly, and the crowning sensation was well-controlled, occurring only briefly with prolonged sitting. The “crowning sensation” is a particular red flag for sacral pathology. While a definitive causal link cannot be established, the high specificity of the crowning sensation for sacral nerve root compression suggests that the Tarlov cyst is the most likely cause. This case highlights the importance of considering Tarlov cysts in patients with persistent low back pain and atypical pelvic symptoms. Lumbosacral MRI is critical for identifying such dual pathology, enabling effective, tailored conservative management and avoiding unnecessary high-risk surgery.

Keywords: Crowning sensation; low back pain; magnetic resonance imaging; perineural cyst; Tarlov cyst

INTRODUCTION

Low back pain (LBP) is a ubiquitous and debilitating condition, representing one of the leading causes of disability worldwide (Mao et al. 2024). The aetiology is diverse, ranging from muscular strains and degenerative changes to more specific structural abnormalities, including space-occupying lesions. Most cases are classified as non-specific, making accurate diagnosis and effective management a common clinical challenge (Han et al. 2022).

Among the less common causes of radicular and sacral pain are Tarlov cysts, also known as perineural cysts. These are cerebrospinal fluid (CSF)-filled sacs that develop between the perineurium and endoneurium of the nerve roots, typically found in the sacral region (Devkota et al. 2024; Murphy et al. 2011; Okumura et al. 2025). A recent meta-analysis suggests a global prevalence of 4.27%, with only about 1% of cysts becoming symptomatic (Klepinowski et al. 2021). They are often asymptomatic and discovered incidentally during lumbosacral imaging for other indications. The factors dictating symptom

onset are not fully understood but are believed to be related to cyst size, location, and the resultant compression or irritation of adjacent nerve roots. When symptomatic, they can cause a variety of complaints, including LBP, sciatica, perineal sensory disturbances and bowel/bladder dysfunction (Kuzucu & Akdulum 2024).

Diagnosis is challenging, as initial management often targets common conditions like lumbar spondylosis or disc herniation, potentially overlooking rarer entities like Tarlov cysts, especially when they coexist with more prevalent degenerative changes. Relying solely on clinical presentation is often insufficient; advanced imaging should be carefully considered to identify the true source of symptoms (Chou et al. 2011). This case report highlighted the diagnostic intricacies involved when a Tarlov cyst coexists with a lumbar disc herniation. A patient's unique “crowning sensation,” linked to S2-S4 nerve root compression, prompted investigation beyond common degenerative disease, revealing a coexisting Tarlov cyst and emphasising the need for a broad differential diagnosis.

CASE REPORT

A 48-year-old female medical officer presented with a six-month history of persistent LBP radiating to the buttocks and posterior thighs, terminating at the knees. There was no associated lower limb motor weakness, nor any symptoms of bowel or urinary incontinence. Neurological examination revealed 5/5 strength throughout the lower extremities, intact sensation in L2-S1 and S2-S4 dermatomes (perianal sensation), symmetric deep tendon reflexes (2+ knees, 1+ ankles) and a negative straight leg raise test. Initial visual analogue scale (VAS) scores were 8/10 for LBP and 6/10 for leg pain.

A working diagnosis of lumbar radiculopathy secondary to disc herniation with underlying lumbar spondylosis was made, and conservative managements, including analgesia and physiotherapy were initiated. At follow-up, she reported a distinctive “crowning sensation”, a feeling of intense pressure and fullness localised to the perineum, vividly described as akin to the foetal crowning stage of childbirth. This sensation was mediated by the pudendal nerve, which received its primary sensory innervation from

the S2, S3 and S4 nerve roots. The symptom was notably exacerbated by prolonged sitting, a posture that increased intrathecal pressure in the dependent sacral thecal sac. Other causes, such as uterine fibroids or pudendal neuralgia, were considered but deemed less likely given the symptom’s precise positional provocation and absence of corroborating gynaecological findings.

Lumbosacral magnetic resonance imaging (MRI) revealed a mild right paracentral disc protrusion at the L3/L4 level, accompanied by a right osteophyte-disc complex. This complex was noted to cause impingement on the traversing right L3 and L4 nerve roots. The central spinal canal was noted to be adequate without significant stenosis (Figure 1). Crucially, the MRI also identified a well-defined, cystic lesion arising from the posterior sacral canal at the S2 level. The cyst measured 12 mm in the anteroposterior dimension and 8 mm in width. The lesion demonstrated signal intensity identical to that of CSF on all sequences (T1 hypointense, T2/STIR hyperintense) (Figure 2), a characteristic of a Tarlov cyst (Devkota et al. 2024). The cyst was

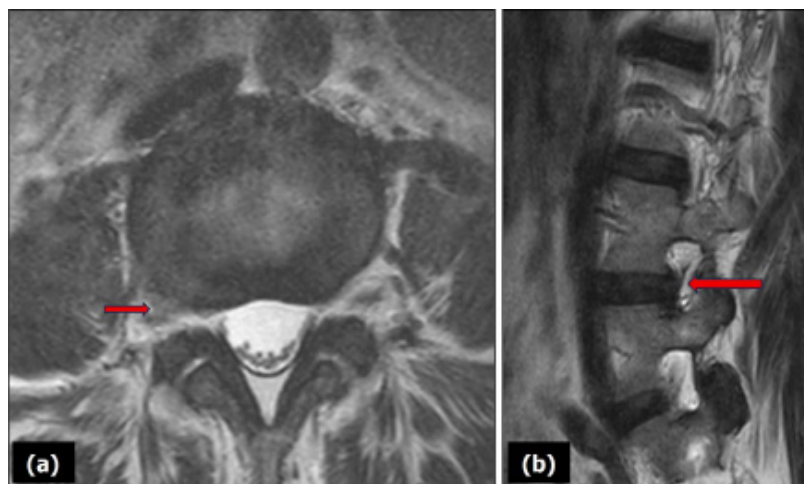


FIGURE 1: Lumbosacral spine MRI. (a) Axial T2-weighted image at the L3/L4 level reveals a mild right paracentral disc protrusion (red arrow), which impinged on the adjacent exiting and traversing nerve roots; (b) The corresponding sagittal T2-weighted image confirmed the disc pathology (red arrow), demonstrating the relationship of the protrusion to the neural structures within the spinal canal

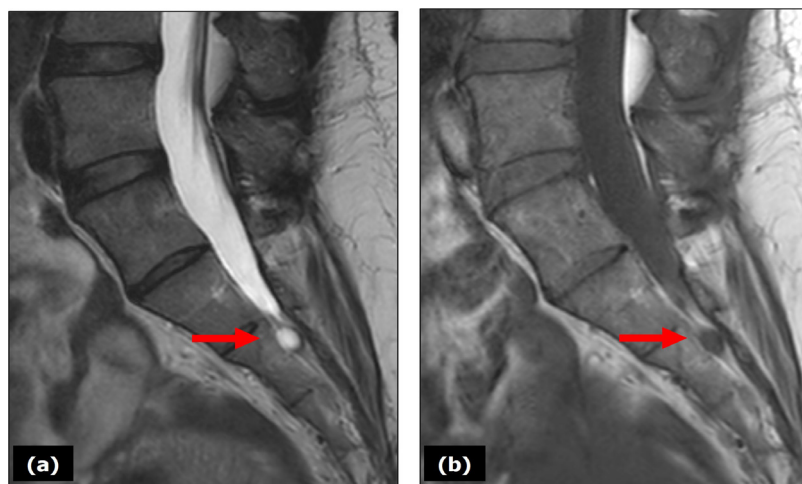


FIGURE 2: (a) Sagittal T2-weighted and (b) sagittal T1-weighted MRI images of the lumbosacral spine. The red arrows pointed to a Tarlov cyst at the S2 level. On the T2-weighted image, the cyst appeared hyperintense (bright), reflecting its fluid content consistent with cerebrospinal fluid (CSF). In the T1-weighted image, the lesion was isointense to the CSF. The cyst was located within the sacral canal.

noted to cause mild scalloping of the adjacent sacral bone but no obvious mass effect on the surrounding nerve roots.

A multidisciplinary team consensus attributed the radicular pain to the disc pathology and the crowning sensation to S2-S4 nerve root compression from the Tarlov cyst (Okumura et al. 2025), given the perfect match between the symptom's location (S2-S4 dermatome) and the cyst's anatomical position. After extensive counselling on surgical risks, including the possibility of CSF leak, infection and neurological worsening (complication rates reported as high as 16.9%) (Kameda-Smith et al. 2024), optimised conservative management was continued. This included neuromodulatory medication (oral pregabalin 75 mg twice daily) and targeted physiotherapy. At one-year follow-up, her VAS scores improved to 3/10 (back) and 2/10 (legs). The crowning sensation persisted with prolonged sitting but was well-managed with lifestyle modifications. Counselling on lifestyle modifications, focusing on ergonomic adjustments for her daily activities and work to avoid prolonged static postures, successfully helped her manage the symptom flare-ups.

DISCUSSION

The management of Tarlov cysts remains a subject of debate, primarily due to their variable symptomatic nature (Devkota et al. 2024; On et al. 2023; Sun et al. 2021). According to the Nabors classification, Tarlov cysts are defined as Type II meningeal cysts (extradural cysts containing spinal nerve root fibres) (Kameda-Smith et al. 2024). As illustrated in this case, many asymptomatic or minimally symptomatic cysts can be managed conservatively as a first-line approach (Devkota et al. 2024). Their symptomatic pathogenesis is linked to hydrostatic and pulsatile forces of CSF, potentially through a ball-valve mechanism, leading to cyst enlargement (Sugawara et al. 2021). Natural history indicates that these cysts can grow, predicting symptom development or worsening, which is caused by compression or irritation of nerve roots within or adjacent to the cyst (Yang et al. 2020).

The Novelty of the "Crowning Sensation" as a Diagnostic Clue

The primary novelty of this case lies in the patient's vivid description of a "crowning

sensation”, an obstetric-like feeling of intense perineal pressure and fullness akin to foetal descent during childbirth. While Tarlov cysts are known to cause a spectrum of pelvic and perineal symptoms (e.g., vague pelvic pressure, coccygeal pain, dyspareunia, and bladder/bowel dysfunction) mediated by the sacral plexus (S2-S4) (Kuzucu & Akdulum 2024; Murphy et al. 2011; Sun et al. 2021; Voyadzis et al. 2001), this specific phenomenologically rich descriptor is exceptionally rare in the documented literature. It provides a powerful and memorable clinical clue that points decisively toward sacral, rather than lumbar pathology.

The symptom's pathophysiology is rooted in the compression or irritation of the S2, S3 and S4 nerve roots, which contribute sensory fibres to the pudendal nerve. The pudendal nerve provides exclusive somatosensory innervation to the perineum, including the vulva, perianal region and clitoris/penis. A space-occupying lesion like a Tarlov cyst at the S2 level can impinge on these roots or their dorsal root ganglia, leading to disordered afferent signals interpreted by the brain as pressure, distension or fullness, sensations phenotypically similar to mechanical stretching of the birth canal. The exacerbation by sitting is pathophysiologically consistent, as this posture elevates intrathecal and intracystic pressure via a ball-valve mechanism, increasing compression on the adjacent sacral nerve roots (Sugawara et al. 2021; Yang et al. 2020). This positional link provides a critical clinical clue differentiating it from lumbar radiculopathy.

However, the pelvic nature of these symptoms creates a high risk of misdiagnosis. Patients are often initially referred for gynaecological, urological or pelvic floor evaluations for common misattributions, including uterine prolapse, pelvic floor dysfunction, pudendal neuralgia or interstitial cystitis, leading to diagnostic delay (Andrieux et al. 2017; Murphy et al. 2011). Our patient's medical background likely facilitated an accurate description, but a non-medical patient might have struggled to articulate the symptom, potentially leading to a delay in obtaining appropriate spinal imaging. Therefore, when

a patient with low back pain presents with this distinctive symptom, it should be considered a specific red flag that elevates suspicion for a sacral nerve root aetiology, such as a Tarlov cyst, and necessitates a dedicated lumbosacral MRI to evaluate the sacral canal thoroughly.

Diagnostic Significance and Dual Pathology

A high clinical suspicion is crucial, especially with atypical symptoms. Our case, along with others in the literature (Kuzucu & Akdulum 2024; Sun et al. 2021), highlights the common diagnostic pitfalls: (i) non-specific symptoms; (ii) limitations in diagnostic thinking where a siloed specialist approach fails to connect disparate symptoms; and (iii) the underutilisation of adequate imaging, despite MRI being the gold standard for identifying Tarlov cysts and distinguishing them from other masses (Sun et al. 2021). Even large (>10 mm) Tarlov cysts can be incidental, so common pathologies must be thoroughly excluded (Andrieux et al. 2017). High-resolution MRI remains the diagnostic cornerstone, delineating the cyst's relationship to nerve roots and differentiating it from other sacral lesions (Murphy et al. 2011).

In this case, the L3/L4 disc pathology logically accounted for the radicular pain in the corresponding dermatomes (anterior thigh), while the S2-level Tarlov cyst provided a direct anatomical explanation for the S2-S4 mediated perineal symptom. While a definitive causal link is challenging without an invasive diagnostic block, the symptom's high specificity for the S2-S4 dermatomes, its exacerbation by spinal pressure, and the absence of other pelvic pathology provide a compelling argument for the Tarlov cyst as the symptomatic source. Compression of these same nerve roots can also lead to other pelvic dysfunctions, such as urinary incontinence, particularly documented in paediatric and female populations (Kuzucu & Akdulum 2024). Based on this experience, we propose that lumbosacral MRI should be strongly considered when a patient presents with (i) persistent LBP refractory to initial conservative care; (ii) symptoms localising to

the sacrum (e.g., crowning sensation, perineal paraesthesia); or (iii) unexplained bladder/bowel changes, even if subtle. The presence of a distinctive, sacrally-mediated symptom like the “crowning sensation” should be considered a particularly strong indicator for this investigation.

Management Rationale within a Context of Therapeutic Debate

The decision to pursue an optimised conservative strategy was multidisciplinary and deliberate, taken within the context of an ongoing debate regarding the optimal management of symptomatic Tarlov cysts (Murphy et al. 2011; Sugawara et al. 2021). While interventions from percutaneous fibrin glue injection to microsurgical cyst excision or novel wrapping techniques exist, there is no consensus on a standard procedure, and intervention carries non-negligible risks, including CSF (reported in up to 29% in some series) and neurological injury (Kameda-Smith et al. 2024; Murphy et al. 2011; Sugawara et al. 2021). Our management choice was justified by several patient-specific factors: (i) the absence of progressive neurological deficit or cauda equina syndrome; (ii) the partial but meaningful response to initial conservative measures; (iii) the patient’s strong preference to avoid invasive procedures; and (iv) the ability to attribute specific symptoms to separate pathologies (disc vs. cyst), allowing for targeted non-operative therapy. This risk-adapted, symptom-focused approach mirrors recommendations in the literature for managing smaller cysts or patients without severe, disabling deficits (Devkota et al. 2024; Voyadzis et al. 2001). The patient’s positive response to conservative management, with improved VAS scores and functional adaptation, underscores that a trial of comprehensive non-operative care is a valid first-line strategy.

Contribution to Clinical Knowledge and Implications for Research

This case broadens the recognised symptom spectrum of sacral nerve root compression by

documenting and mechanistically linking the vivid “crowning sensation” to an S2-level Tarlov cyst. It moves beyond generic terms like “perineal pressure” to provide a specific, clinically evocative descriptor that can serve as a diagnostic red flag. To translate this observation into generalisable knowledge, future research should systematically explore and validate the pelvic sensory descriptors used by patients with confirmed sacral radiculopathies. Developing a standardised patient-reported outcome measure for sacral symptoms could enhance diagnostic accuracy, facilitate clinical phenotyping, and provide a sensitive tool for assessing treatment outcomes in trials. Furthermore, prospective studies are needed to clarify the natural history of cysts causing such focal symptoms and to better define the predictors of response to conservative versus interventional management.

Limitations

Key limitations of this report include the single-case nature and the subjective, unquantifiable quality of the “crowning sensation”, which makes it difficult to quantify and correlate with imaging findings across different patients objectively (Kameda-Smith et al. 2024; Okumura et al. 2025). The lack of a definitive diagnostic nerve block to confirm the sacral nerve root as the pain generator is another constraint. Future research should focus on larger cohorts and develop standardised outcome measures for sacral radicular symptoms.

CONCLUSION

This case highlights that Tarlov cysts can cause particular symptoms like the “crowning sensation,” a critical clue to sacral pathology. It underscores the necessity of a broad differential diagnosis for persistent LBP. A meticulous history, attention to sacrally-mediated symptoms, and judicious use of MRI are essential for identifying dual pathology. A multidisciplinary, patient-centred approach that prioritises conservative management can yield excellent outcomes.

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