ISSN 2791-156X
Journal of Health and Rehabilitation Research (JHRR)

Vol. 3, Issue 2

Original Article

Clinical Findings of Tarlov Cyst According to Its Location and Level in Lumbosacral Spine on Magnetic Resonance Imaging

Furozan Baig[1*], Qurat Ul Ain[1], Arooj Fatimah[1], Amtullah Ansari[1], Ushna Qadeer[2], Aqsa Mansoor[3]

[1] *University of Management & Technology, Lahore*
[2]*Akhtar Saeed Medical and Dental College, Lahore*
[3]*The Green International University, Lahore*
[*]*Corresponding Author: Furozan Baig, Demonstrator, Email: furozan.baig@umt.edu.pk*

No conflict of interest declared | Received: 20-10-2023; Revised & Accepted: 27-10-2023; Published: 06-11-2023.

ABSTRACT

Background: Tarlov cysts are fluid filled cysts that are most found in the lumbosacral spine. Patients often present with a series of distinguished neurological deficits that correlate with the mass effects of cyst provided on the level and location of the lumbosacral spine.

Objective: To determine the clinical findings of Tarlov Cyst associated with its level and location magnetic resonance imaging

Methods: A total of 60 patients with different sets of neurological deficits were included in this descriptive cross-sectional study conducted in Ghurki Trust and Teaching hospital. Data was collected by using Questionnaire/Performa. An MRI procedure was used to assess the Tarlov cysts. A Convenient sampling technique was used in this study. Data was evaluated and analysed with SPSS v-25 and Microsoft excel.

Results: Out of 60 patients, there were 40 females (66.67 %) and around 20 males (33.3%). The most common neurological deficits that was found in patients were numbness seen in 50 patients, loss of reflexes seen in 40 patients, mass effects in the affected region were seen in 20 patients and changes in the bowel function was seen in 10 patients. The most common location of Tarlov cysts found in patients was sacral region 28(46.7%), lumbosacral region 24(40%) and lumbar region 8(13.3%).

Conclusion: The study concluded that the frequency of female was more than male. And the most common site of Tarlov cyst was found to be at LV4-LV5 and LV5-level S1 exhibiting different clinical manifestation.

Keywords: Tarlov Cyst, Sacrum, Perineural Cyst, Magnetic Resonance Imaging

INTRODUCTION

Tarlov cysts, or perineural cysts, are fluid-filled sacs that emerge on the spinal nerve roots, predominantly within the lumbosacral region (1). Despite their identification in as many as 5% of individuals, they frequently remain asymptomatic, leading to underdiagnosis (2). These cysts can lead to a spectrum of clinical manifestations ranging from incidental radiological findings to severe neuropathic pain, neurogenic bladder, and even neurogenic bowel (3). Notably, they are more prevalent in females, the intricacies of their pathophysiology and the optimal therapeutic interventions for symptomatic cases continue to be areas of active investigation (4). Symptomatic presentations can vary widely, including sacral and lumbar pain, sciatica, coccydynia, numbness, and in some cases, leg weakness. The pathogenesis of symptoms is believed to be twofold: the direct mechanical effects of the cysts and the dynamic pressures exerted by cerebrospinal fluid (5).

In a clinical setting, the nonspecific presentation of Tarlov cysts may lead to misdiagnosis or oversight, particularly since symptoms can be exacerbated by standing, walking, or coughing, and in some instances, may be related to previous trauma (6). Magnetic Resonance Imaging (MRI) is the cornerstone

of diagnosis, providing excellent soft tissue contrast and specific visualization of the cysts (7). Typical MRI findings include low signal intensity on T1-weighted images and high signal intensity on T2-weighted images adjacent to the dorsal root ganglion, with no post-contrast enhancement and facilitated diffusion on DWI/ADC sequences. The STIR sequence, with its fat-suppression capabilities, is particularly valuable for depicting the extent of the pathology (8).

This study has been conducted with the aim of elucidating the clinical findings of Tarlov cysts in the lumbosacral spine as evident on MRI, examining the correlation between the cysts' location and size and the clinical symptoms. By providing refined diagnostic criteria and elucidating the neurological sequelae of Tarlov cysts, this study aims to aid the medical community in achieving timely and precise diagnoses, which are essential for preventing the advancement of symptoms and averting further complications (9). The research emphasizes the diverse manifestations of Tarlov cysts and highlights their potential role as a differential diagnosis in radicular pain syndromes (10). With a concentration on the MRI features and clinical presentation, the goal is to improve the recognition and inform the management of this frequently misunderstood condition. The findings of this study, intended for publication, are expected to contribute valuable knowledge to the existing literature on Tarlov cysts and enhance the current understanding of their clinical significance (11).

Figure 1 Representing the aberrant location of Tarlov cyst in the lumbosacral region.

MATERIAL AND METHODS:

This study adopted a descriptive cross-sectional design, conducted at Ghurki Trust Teaching Hospital. We included a cohort of 60 patients under the age of 40 years (12). Inclusion criteria encompassed patients presenting with a history of lower back pain, tuberculosis, and weight loss, among other symptoms. We excluded individuals with claustrophobia, metallic implants, pacemakers, and cochlear implants due to the contraindications for MRI procedures (13, 14).

Data collection was carried out using a structured questionnaire or proforma specifically designed for this research (15). The primary tool for assessing the presence and characteristics of Tarlov cysts was Magnetic Resonance Imaging (MRI). The sampling method employed was non-convenient, relying on the available subjects who met the study criteria during the timeframe of the study (16, 17).

Data evaluation and analysis were performed using the Statistical Package for the Social Sciences (SPSS) version 25 and Microsoft Excel. These tools facilitated the management of the dataset and allowed for comprehensive statistical analysis. All data handling procedures adhered to the relevant ethical guidelines to ensure confidentiality and integrity of the research (18).

RESULTS:

The study comprised a total of 60 patients, with a greater prevalence of females, who accounted for 40 (66.67%) of the participants, while males represented 20 (33.33%). The clinical presentations observed were predominantly numbness extending below the neck region, documented in 50 patients (83.33%). Altered reflexes, encompassing both diminished pain sensation and reflex jerking, were noted in 40 patients (66.67%). A subset of patients, approximately 20 (33.33%), exhibited specific localized symptoms, which were attributable to the mass effect of aberrantly positioned Tarlov cysts within the spinal column. Additionally, alterations in bowel function were observed in 10 patients (16.67%).

Table 1 : Frequency Distribution of Tarlov Cysts by Gender and Anatomical Region

Gender	Frequency (%)	Anatomical Region	Frequency (%)
Female	40 (66.67%)	Sacral Region	28 (46.7%)
Male	20 (33.33%)	Lumbosacral Region	24 (40%)
-	-	Lumbar Region	8 (13.3%)
N=60			

Regarding the dimensions of the Tarlov cysts, the most frequently encountered sizes were approximately 8.0x8.0 mm and 8.7x12 mm. These cysts were most appreciated posterior to the S1 and S2 segments and within the lumbosacral region. Upon evaluation of the MRI findings, the prevalence of Tarlov cysts within different spinal regions on T2-weighted imaging was as follows: sacral region in 28 patients (46.7%), cervical region in 14 patients (23.3%), lumbosacral region in 24 patients (40%), and the lumbar region in 8 patients (13.3%). The results are summarized in Table 1, which provides a concise overview of the frequency distribution of Tarlov cysts by gender and anatomical region.

DISCUSSION:

Our investigation into the incidence and clinical presentation of Tarlov cysts expands upon the current body of knowledge with a comparative approach, juxtaposing our findings against the backdrop of pre-existing literature (19). The Tarlov cysts have been somewhat enigmatic entities in spinal pathology, presenting a diverse range of symptoms that complicate the diagnostic process. Consistently, as with previous studies, our research identified a higher incidence of these cysts within the female population, aligning with findings that suggest hormonal and anatomical factors may play a contributory role (20).

Comparatively, the symptomatology of numbness and reflex abnormalities mirrors that of earlier reports, where such symptoms were common in patients with Tarlov cysts. However, our study extends these observations by detailing the specific locations and sizes of the cysts, thereby providing a more nuanced understanding of their clinical impact. The manifestation of symptoms correlated with the cyst size and location, particularly in the sacral region, is a significant highlight of our study (21). The frequency of cyst occurrence in the lumbosacral region, observed in 40% of our patients, resonates with findings from studies such as those by Kozłowski et al. (2013), which also underscored the sacral spine as a common site (22). Nevertheless, our study reports a more granular analysis of cyst dimensions, contributing to a more detailed clinical profile that may aid in diagnosis and management (23).

Our findings contrast with previous studies in the proportion of patients presenting with bowel function changes, which was less prevalent in our cohort. This discrepancy underscores the variable clinical presentations of Tarlov cysts and may reflect differences in study populations or methodologies. While our research corroborates several aspects of the existing literature, it also sheds light on the lesser-discussed clinical presentations, such as pinpoint locations of clinical manifestation due to aberrant cyst placement and mass effect (24, 25). These nuanced findings are imperative for clinical practice, as they suggest that even small cysts in critical locations may have significant clinical repercussions (26). The interplay between our findings and established data leads to a more comprehensive understanding of Tarlov cysts (27). Our comparative approach emphasizes the need for clinicians to maintain a high index of suspicion for Tarlov cysts in patients presenting with lower back pain and associated neurological symptoms, especially when such symptoms are disproportionate to findings from common conditions like disc herniation or degenerative disc disease (28).

Our study's strengths lie in its specific focus on the symptomatic presentation and imaging characteristics of Tarlov cysts, providing a detailed comparative analysis with previous literature (29).

However, limitations include the cross-sectional nature and the small sample size, which may not capture the full spectrum of clinical presentations. Additionally, the non-randomized selection of participants could introduce selection bias (30).

CONCLUSION:

In conclusion, our study reaffirms the association between Tarlov cysts and a range of neurological symptoms, with a higher predilection in females. It contributes to the ongoing discussion regarding the clinical importance of Tarlov cysts and underscores the necessity of their consideration in the differential diagnosis of lumbar and sacral pathology. Further research with larger, more diverse populations is essential to fully elucidate the clinical course of Tarlov cysts and optimize patient care.

REFERENCES:

1. Fletcher-Sandersjöö A, Mirza S, Burström G, Pedersen K, Kuntze Söderqvist Å, Grane P, et al. Management of perineural (Tarlov) cysts: a population-based cohort study and algorithm for the selection of surgical candidates. Acta neurochirurgica. 2019;161:1909-15.
2. Jain M, Sahu NK, Naik S, Bag ND. Symptomatic Tarlov cyst in cervical spine. BMJ case reports. 2018;11(1).
3. Kozłowski P, Kalinowski P, Jankiewicz M, Kozłowska M, Bilski M, Budny A, et al. [Perineural cysts]. Polski merkuriusz lekarski : organ Polskiego Towarzystwa Lekarskiego. 2018;45(269):201-4.
4. Dayment BAJ, Ingham Clark OD. Letter to the Editor. Surgical and percutaneous methods for the treatment of Tarlov cysts. Journal of neurosurgery Spine. 2019;32(2):332-3.
5. Dayyani M, Zabihyan S. Giant Tarlov Cyst of Infancy. World Neurosurg. 2019;123:348-50.
6. Fletcher-Sandersjöö A, Mirza S, Burström G, Pedersen K, Kuntze Söderqvist Å, Grane P, et al. Management of perineural (Tarlov) cysts: a population-based cohort study and algorithm for the selection of surgical candidates. Acta Neurochir (Wien). 2019;161(9):1909-15.
7. Hulens M, Dankaerts W, Rasschaert R, Bruyninckx F, Stalmans I, Vansant G, et al. Hydrocephalus associated with multiple Tarlov cysts. Medical hypotheses. 2019;130:109293.
8. 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. European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society. 2019;28(10):2237-48.
9. Mijalcic MR, Djurovic B, Cvrkota I, Jokovic M, Bascarevic V, Micovic M. Tarlov cyst-a rare lesion in children: case report. Child's nervous system : ChNS : official journal of the International Society for Pediatric Neurosurgery. 2019;35(4):701-5.
10. D'Urso PI. Letter: Growth of Lumbosacral Perineural (Tarlov) Cysts: A Natural History Analysis. Neurosurgery. 2020;86(6):E589.
11. Lim VM, Khanna R, Kalinkin O, Castellanos ME, Hibner M. Evaluating the discordant relationship between Tarlov cysts and symptoms of pudendal neuralgia. American journal of obstetrics and gynecology. 2020;222(1):70.e1-.e6.
12. Mensah-Brown KG, Yang AI, Welch WC. In Reply: Growth of Lumbosacral Perineural (Tarlov) Cysts: A Natural History Analysis. Neurosurgery. 2020;86(6):E590.
13. Hentzen C, Cabrilo I, Malladi P, Simeoni S, Amarenco G, Zaidman N, et al. Sacral Tarlov cysts: Neurophysiology abnormalities and correlation with pelvic sensory and visceral symptoms. European journal of neurology. 2023;30(9):2838-48.

14. Poyuran R, Kalaparti V, Thomas B, Kesavapisharady K, Narasimhaiah D. Nonneoplastic and noninfective cysts of the central nervous system: A histopathological study. Neuropathology : official journal of the Japanese Society of Neuropathology. 2023;43(3):221-32.
15. Sharma M, Boakye M. Letter to editor regarding "Management of perineural (Tarlov) cysts: a population-based cohort study and algorithm for the selection of surgical candidates". Acta Neurochir (Wien). 2020;162(1):129-30.
16. Yucesoy K, Yilmaz M, Kaptan H, Ikizoglu E, Arslan M, Erbayraktar SR. A novel surgical technique for treatment of symptomatic Tarlov cysts. British journal of neurosurgery. 2023;37(2):188-92.
17. Wu C, Liu B, Xie JC, Wang ZY, Ma CC, Yang J, et al. [Reinforced radiculoplasty for the treatment of symptomatic sacral Tarlov cysts: A clinical analysis of 71 cases]. Beijing da xue xue bao Yi xue ban = Journal of Peking University Health sciences. 2023;55(1):133-8.
18. Yang AI, Rinehart CD, McShane BJ, Hitti FL, Welch WC. Growth of Lumbosacral Perineural (Tarlov) Cysts: A Natural History Analysis. Neurosurgery. 2020;86(1):88-92.
19. Chen Z, Lin C. Tarlov cyst with self-healing cauda equina syndrome following combined spinal-epidural anesthesia: a case report. BMC anesthesiology. 2023;23(1):352.
20. Zhu H, Shen L, Chen Z, Yang M, Zheng X. Giant Tarlov Cysts with Rare Pelvic Extension: Report of 3 Cases and Literature Review. World Neurosurg. 2020;139:505-11.
21. Almansa AH, Infante AMJ, Cutillas AMR, Álvarez LG. Symptomatic sacral Tarlov cyst: Case report and review of literature. Neurocirugia (English Edition). 2023;34(2):101-4.
22. Kozłowski P, Kalinowski P, Kozłowska M, Jankiewicz M, Budny A, Starosławska E, et al. Spinal Perineural Cysts among European Patients. Journal of neurological surgery Part A, Central European neurosurgery. 2021;82(5):463-7.
23. Shoyab M. Tarlov cysts in back pain patients: prevalence, measurement method and reporting points. The British journal of radiology. 2021;94(1127):20210505.
24. Porche K, Hoh DJ. Editorial. Microsurgical treatment of sacral Tarlov cysts. Journal of neurosurgery Spine. 2022;37(6):902-3.
25. Wang Z, Jian F, Chen Z, Wu H, Wang X, Duan W, et al. Percutaneous Spinal Endoscopic Treatment of Symptomatic Sacral Tarlov Cysts. World Neurosurg. 2022;158:e598-e604.
26. Sun P, Xu W, Ye Y, Zhong F, Wan X, Li Y. Neglected Tarlov cysts: a case of a Tarlov cyst with spermatorrhea. Eur J Med Res. 2021;26(1):44.
27. Ma Q, Xie J, Yang C, Wu C, Zhang J, Yin X, et al. Multiple dimensions of radiographic reconstruction for the optimal operative strategy of sacral meningeal cysts. European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society. 2022;31(11):3146-58.
28. Berlin E, Khan S, Sullivan W, Schneider B, Walker J. Giant Tarlov Cyst and the Importance of Advanced Imaging Before Interventional Spine Injections. American journal of physical medicine & rehabilitation. 2022;101(3):e46-e7.
29. Feigenbaum F, Parks SE, Chapple KM. Prospective Validation of a Quality-of-Life Measure for Women Undergoing Surgical Intervention for Symptomatic Sacral Tarlov Cysts: The Tarlov Cyst Quality of Life Scale. World Neurosurg. 2022;165:e276-e81.
30. Huang Q, Li J, Zhou Q, Li H, Yang X, Peng L, et al. Management of Symptomatic Sacral Perineural Cysts: A New Surgical Method. World Neurosurg. 2022;167:e978-e89.

