Original Article

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

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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

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (%)</th>
<th>Anatomical Region</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>40 (66.67%)</td>
<td>Sacral Region</td>
<td>28 (46.7%)</td>
</tr>
<tr>
<td>Male</td>
<td>20 (33.33%)</td>
<td>Lumbosacral Region</td>
<td>24 (40%)</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>Lumbar Region</td>
<td>8 (13.3%)</td>
</tr>
<tr>
<td>N=60</td>
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</table>

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: