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**Case Report**

# Intercepting Intracept: A Case Report of Idiopathic Arachnoiditis

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## Abstract

**Introduction:** Determining the exact diagnoses for low back is challenging due to the myriad of causative factors. Consequently, rare diagnoses like arachnoiditis are often overlooked, causing patients with this condition to be ineffectively treated. Arachnoiditis involves inflammation of the arachnoid membrane enveloping the spinal cord, can is caused by diverse etiological factors, including infections, trauma, spinal cord contamination, tumors, and genetic predispositions.

**Case:** In this case report, the author describe a 43-year-old female with a past medical history of anxiety and depression who presented with chronic back pain. The patient had previously undergone trials of various neuropathic and nociceptive modulating medications as well as transforaminal and caudal epidural corticosteroid injections, yielding minimal relief. On the evaluation, the patient's lumbar spine MRI revealed findings suggestive arachnoiditis, a diagnosis that had also been missed on a previous MRI a year prior. Given this, the patient was advised to not undergo the Intercept procedure which had been previously recommended by another provider.

**Discussion:** Given its resemblance to other neurologic conditions, the diagnosis of arachnoiditis involves a comprehensive approach with history, physical examination, and imaging modalities such as MRI or CT myelography serving as critical components. In this case, the patient did not have any history of infection or trauma, making the diagnosis more elusive, and requiring the team to pay more heed to the imaging finding. Although her imaging served supportive evidence or arachnoiditis, it is important to recognize its correlation with clinical findings and the severity of symptoms is not always consistent. Management of arachnoiditis requires a multi-faceted approach with steroids, neuropathic modulating medications, muscle relaxants, cognitive behavioral therapy, and physical therapy.

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**Conclusion:** This case report underscores the diagnostic challenges and clinical intricacies associated with spinal arachnoiditis. The presented patient's atypical symptoms and protracted diagnostic journey highlight the importance of ongoing vigilance and comprehensive evaluation in chronic pain management. Further research should investigate effective treatment modalities for this chronic and debilitating condition that is overlooked, given its similarity to other diagnoses and rare prevalence.

**Keywords:** Back pain; Arachnoiditis; Diagnostic challenges; Pain management; Imaging modalities.

## Introduction

Chronic pain presents a formidable challenge, impacting individuals, families, and healthcare systems and necessitating effective interventions. Among the myriad diagnoses affecting the global population, low back pain stands out as one of the most significant contributors [1]. However, the complexity of chronic back pain often arises from a myriad of causative factors, complicating the development of targeted treatment approaches. Within the realm of chronic pain, pain providers may occasionally encounter the relatively uncommon diagnosis of spinal arachnoiditis, necessitating awareness of pertinent imaging findings and treatment options.

Characterized by inflammation of the arachnoid membrane enveloping the spinal cord, spinal arachnoiditis stems from diverse etiological factors, including infections, trauma, spinal cord contamination, spinal tumors, and genetic predispositions [2]. The clinical course of arachnoiditis exhibits considerable variability, posing challenges in its differentiation from other neurological conditions with analogous manifestations [3]. This case report aims to elucidate an atypical presentation of arachnoiditis, underscoring the importance of comprehensive imaging analysis and meticulous consideration of the patient's medical history.

## Case report

The author present a case involving a 43-year-old female with a past medical history of anxiety and depression. The patient sought a second opinion for chronic low back pain that had persisted for more than three years. The characterized low back pain demonstrated diurnal variability, predominantly described as sharp pains originating in the lumbar region and radiating bilaterally into the L5-S1 distribution.

Furthermore, the patient described transient episodes of lower extremity paralysis when in a supine position for approximately twenty minutes, which would resolve after a few minutes with sitting up. The patient denied any history of fevers, chills, weight loss, and bowel or bladder incontinence. The patient underwent trials of various neuropathic and nociceptive modulating medications, yielding minimal relief. While stretching and physical therapy occasionally provided alleviation, it was noteworthy that certain exercises and stretches exacerbated her pain and debility. Prior to the initial evaluation, the patient was seen by an outside pain group where a lumbar MRI was completed in 2022. The report was notable for severe degenerative disc disease at L5-S1, small right posterior paracentral disc protrusion abutting the traversing right S1 nerve root, and posterior central disc protrusion with annular with mild thecal sac


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compression at L4-L5 (Figures 1 and 2). The patient underwent transforaminal and caudal epidural corticosteroid injections, but regrettably, significant relief was not achieved.

After the lack of efficacy observed with physical therapy, medications, and corticosteroid injections, the patient was presented with the option of the Intracept procedure, also recognized as intraosseous basivertebral nerve ablation.

However, uncertain about the potential for improvement, the patient opted for a second opinion.

**Figure 1:** Sagittal view of MRI lumbar spine without contrast, T2 view short tau inversion recovery sequence in 2022.

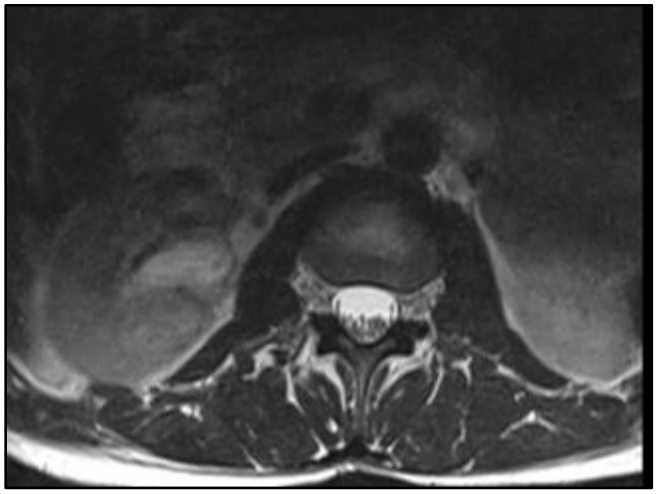

**Figure 2:** Axial view of MRI lumbar spine without contrast, T2 view in 2022.


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During the examination, the patient exhibited no midline spinal tenderness, axial loading discomfort, or positive straight leg raise, and the author encountered difficulty consistently reproducing her reported pain. Given the unusual clinical presentation and the failure of previous interventions, a repeat lumbar MRI was ordered approximately one year after her first MRI. The subsequent report continued to only describe severe degenerative disc disease at L5-S1, along with a small right posterior paracentral disc protrusion and Modic Type 1 and 2 changes (Figures 3 and 4).

**Figure 3:** Sagittal view of MRI lumbar spine without contrast, T2 view inversion recovery sequence in 2023.

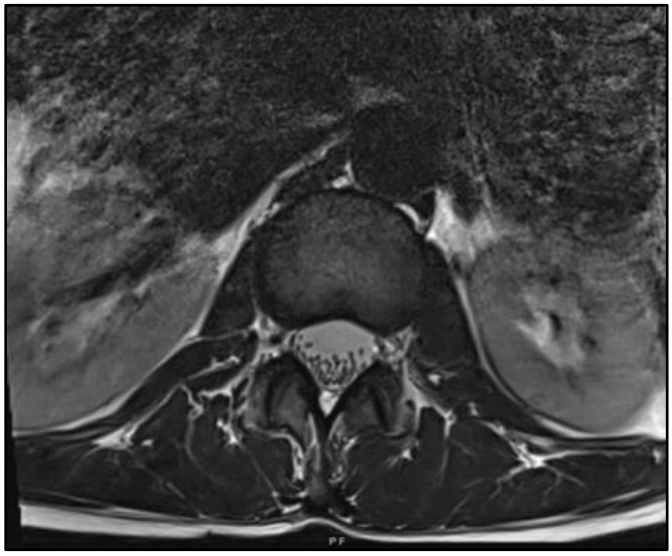

**Figure 4:** Axial view of MRI lumbar spine without contrast, T2 view in 2023.


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Upon the independent analysis of the MRI imaging, the author observed irregular thickening and clumping of nerve roots within the cauda equina as well as serpiginous appearance on the sagittal view, indicative of arachnoiditis. These findings were consistent with the MRI conducted in 2022. Considering these results, the doctors advised against proceeding with the Intracept procedure and instead initiated a treatment plan comprising baclofen, oral steroids, and ethyl eicosapentaenoic acid. Subsequently, the patient reported a reduction in pain.

**Discussion**

The arachnoid mater, one of the three protective membranes enveloping the spinal cord and nerve roots, is inherently thin and delicate [2]. Exposure to chemical, mechanical, and infectious insults can induce injury and inflammation within the subarachnoid or subdural space, prompting the development of fibrinous exudates and collagen deposits [2,3]. As the condition progresses, scar tissue encapsulates the nerve roots, resulting in impaired blood supply and cerebrospinal fluid flow-a pathological state referred to as chronic adhesive arachnoiditis [3]. Consequently, nerves may undergo damage, atrophy, or, in severe instances, become tethered. Potential complications encompass intrathecal bony metaplasia, spinal cord swelling, myelomalacia, cauda equina syndrome, and hydrocephalus [3].

The clinical presentation of arachnoiditis exhibits variability in both course and severity. The symptoms associated with arachnoiditis closely resemble those of other neurological conditions, posing challenges in the differential diagnosis [2]. Patients afflicted with spinal arachnoiditis typically manifest burning pain in the lower back, potentially radiating down to the lower extremities. Additional clinical features encompass pain at rest, muscle spasms affecting the back and lower extremities, partial or complete paralysis of the lower extremities, unexplained skin rashes and itching, as well as urinary symptoms, including urgency, frequency, and incontinence [2,3].

The patient exhibited many of these symptoms highlighting the importance of reviewing medical history as a pain provider. A thorough history was obtained from the patient to determine potential causative factors for severe ongoing symptoms. In the case, the patient's past medical history did not reveal trauma, spinal tumors, or infections like HIV or TB. The patient had undergone steroid injections in hopes of achieving back pain relief. Although corticosteroid injections pose a risk for contamination of the spinal cord and development of arachnoiditis, this intervention was done after the onset of symptoms. Therefore, it is not likely the etiology of her arachnoiditis. Regrettably, there exists no reliable laboratory test or consistent electromyography findings that can be employed for the formal diagnosis of arachnoiditis [3,4]. Consequently, diagnosing this chronic and debilitating condition necessitates a comprehensive clinical evaluation, coupled with advanced imaging modalities such as MRI or CT myelography [3-5]. It is crucial to underscore that while myelography remains a diagnostic option, it


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is not the preferred choice due to its potential implication in precipitating arachnoiditis [2,6,7].

MRI assumes a pivotal role in the diagnostic process of adhesive arachnoiditis, boasting a sensitivity of approximately 92% and a specificity reaching 100% [3,8]. Despite imaging studies offering supportive evidence, the correlation with clinical findings and the severity of symptoms is not always consistent. A retrospective study, which included 28 patients with lumbar arachnoiditis, underscored the inconsistent alignment between MRI findings and clinical features, with only a few notable exceptions.

The study, conducted by Parenti and colleagues, revealed that the presence of confounding lumbar pathology exerted a discernible influence on symptom dynamics [7]. Furthermore, the nerve count was found to exhibit a significant association with both motor and sensory symptoms [7].

As a result, the acquisition of a comprehensive patient history emerges as a pivotal component in the diagnostic evaluation, aimed at identifying potential causes or risk factors. Comprehensive management strategies for arachnoiditis encompass a multi-faceted approach, involving the administration of steroids for the anti-inflammatory effects [9,10]. Neuropathic modulating medications, such as pregabalin and gabapentin, along with opioids, and muscle relaxants like baclofen, are commonly employed for pain control [5]. Physical therapy and cognitive-behavioral therapy are integral components of the therapeutic regimen [5,9,10].

In cases where conservative measures prove insufficient, additional interventions such as adhesiolysis and radiofrequency rhizotomy may be considered, although the role of surgical treatment remains ambiguous [12]. In the field of interventional pain, lumbar and caudal epidurals are among the most frequently performed procedures for radicular symptoms [12]. However, providers should exercise caution, as these procedures are generally not recommended due to concerns that the injections could potentially exacerbate the arachnoiditis condition. This caution is rooted in suggestion that certain injectates might contribute to the development or worsening of arachnoiditis [13,14].

Based on the current literature available, the author advocates against the use of epidural or caudal steroid injections in patients with arachnoiditis. Lastly, prior to the evaluation, the patient was presented with the option of Intraosseous Basivertebral Nerve Radiofrequency Neurotomy. Notably, there exists moderate-quality evidence suggesting the efficacy of this procedure in reducing pain and disability among patients with chronic low back pain, particularly those selected based on type 1 or 2 Modic changes, as indicated by Conger, et al. [15]. This was seen on the patients' MRI. However, to the author's knowledge, there are no reports of this procedure being conducted in conjunction with concomitant arachnoiditis. Therefore, the author advocates against this procedure due to the requirement for injectate and blocking medications, which can potentially exacerbate arachnoiditis [13-16].


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## Conclusion

In conclusion, this case report underscores the diagnostic challenges and clinical intricacies associated with spinal arachnoiditis, a condition that may elude identification through conventional means. The presented patient's atypical symptoms and protracted diagnostic journey highlight the importance of ongoing vigilance and comprehensive evaluation in chronic pain management. These findings emphasize the necessity of advanced imaging techniques, particularly MRI, in unveiling subtle indicators of arachnoiditis, despite its occasional discordance with clinical severity. The lack of standardized diagnostic markers further underscores the reliance on meticulous clinical assessment and history-taking by pain providers. Importantly, the patient's positive response to a tailored treatment plan involving baclofen, oral steroids, and ethyl eicosapentaenoic acid serves as a testament to the significance of individualized therapeutic strategies in managing arachnoiditis.

As the field navigates through evolving interventions for chronic pain, caution is advised against certain procedures, such as epidural or caudal steroid injections, in patients with confirmed or suspected arachnoiditis. This report contributes to the growing body of knowledge on arachnoiditis, emphasizing the need for ongoing research and awareness to enhance the diagnostic and therapeutic paradigms in the realm of chronic pain management.

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