CME Journal of Neurology and Neuroscience *Case Report*

Occult Spinal Dysraphism with Dermal Sinus and Filum Terminale Lipoma – Case Report

Larissa Bruch Caetano[1]*, Lilian Abdon[1], Caroline Klovan[1], Amanda Brandt de Oliveira Villar[2], Thaisa Fernanda Schuh[2], Natália Jung de Oliveira[1], Eduardo Goellner[1] and Cristiane Soveral DAviz[1]

[1]Hospital Moinhos de Vento Rua Ramiro Barcelos, 910 - Moinhos de Vento, Porto Alegre, RS, Brazil.

[2]Pontifícia Universidade Católica do Rio Grande do Sul Av. Ipiranga, 6681 - Partenon, Porto Alegre - RS, 90619-900, Brazil.

Abstract

The purpose of this report is to describe the case of a pediatric patient with occult spinal dysraphism associated with filum terminale lipoma and dermal sinus — conditions resulting from failures in neural tube closure during embryonic development, without exposure of neural tissue. Although there were no initial neurological symptoms, the presence of cutaneous stigmata in the lumbosacral region led to investigation by magnetic resonance imaging (MRI), which revealed a low-lying conus medullaris (L3–L4). The patient underwent surgery to release the filum terminale and remove the dermal sinus, aiming to prevent acute neurological complications such as central nervous system infection and progressive ones like tethered cord syndrome.

Keywords

Spinal Dysraphism, Filum Terminale Lipoma, Dermal Sinus.

Correspondence

Larissa Bruch Caetano

Hospital Moinhos de Vento Rua Ramiro Barcelos, 910 - Moinhos de Vento, Porto Alegre, RS, Brazil.

Received Date: 25 August 2025

Revised Date: 22 September 2025

Accepted Date: 08 October 2025

Publication Date: 16 October 2025

Introduction

Occult spinal dysraphism belongs to a group of congenital malformations resulting from defects in neural tube closure triggered by failures during neurulation in the early weeks of embryonic development, without open exposure of neural tissue. Within this context, filum terminale lipoma and dermal sinus are conditions associated with occult spinal dysraphism, often underdiagnosed due to their subtle clinical presentation but with the potential to cause neurological complications if not identified and treated appropriately [1].

Filum terminale lipoma is considered a secondary neurulation anomaly, characterized by thickening of the filum terminale due to the presence of residual cells that differentiate into adipocytes. This condition can lead to tethered cord syndrome, in which the spinal cord is stretched, resulting in functional changes in motor and sensory neurons. Dermal sinus, on the other hand, results from incomplete fusion between the neuroectoderm and the cutaneous ectoderm, forming an abnormal epithelial tract that can serve as an entry point for central nervous system infections [2].

Early diagnosis is crucial and is commonly based on clinical findings, such as the presence of cutaneous stigmata in the lumbosacral region, combined with imaging studies like MRI, which allow detailed visualization of anatomical malformations. Treatment strategies for these conditions usually involve surgical intervention to release the spinal cord, remove the adipose tissue, and correct the dermal sinus tract, with a focus on preventing infection and the progression of possible neurological deficits.

The association between filum terminale lipoma and dermal sinus is particularly relevant, as these are distinct conditions that can occur independently or coexist, as in the present case. This report describes the clinical presentation, diagnostic findings, and therapeutic approach in a patient with occult spinal dysraphism associated with filum terminale lipoma and dermal sinus.

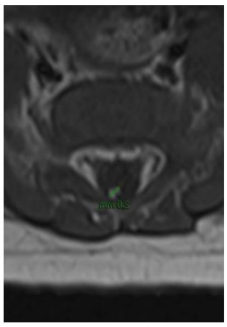
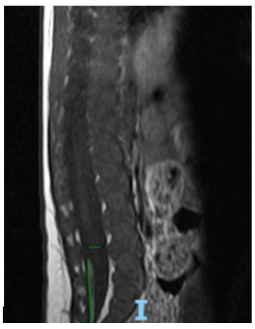
Case Report

A 6-month-old male patient was referred for pediatric evaluation due to the presence of a cutaneous stigma. He was referred to the neurosurgery department, where a physical examination revealed no neurological abnormalities. Movement of the lower limbs was preserved, and the feet were in an anatomical position, with no signs of valgus or varus deformities. There were no urinary tract alterations.

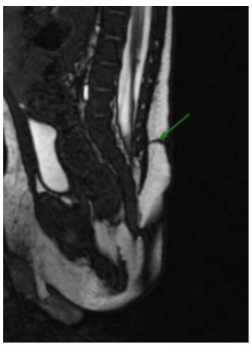
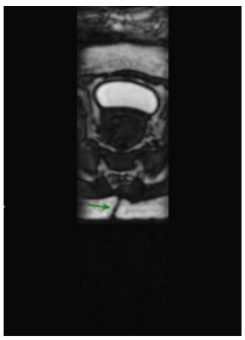
Magnetic resonance imaging (MRI) revealed a spinal cord with normal thickness and signal intensity but a low-lying conus medullaris, terminating at the L3–L4 level. A filum terminale lipoma was identified, measuring 0.2 cm in thickness and extending 2.5 cm craniocaudally, ending at the distal end of the thecal sac at S3. A linear tract extending from the cutaneous surface in the lumbosacral region at S2 to the distal end of the thecal sac was also identified, suggestive of

a congenital dorsal dermal sinus. Thus, a diagnosis of occult spinal dysraphism associated with dermal sinus and filum terminale lipoma was established [3,4].

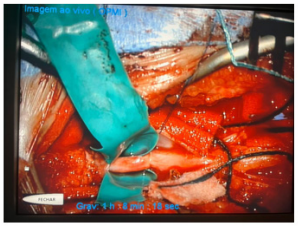
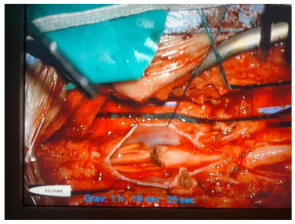
The patient underwent surgical removal of the dermal sinus and release of the filum terminale. The procedure was completed without complications.

Images 1 and 2: Spinal magnetic resonance imaging (MRI) showing a filum terminale lipoma.

Images 3 and 4: Spinal magnetic resonance imaging (MRI) showing a dermal sinus.

Images 5 and 6: Separation of the filum terminale and release of the tethered cord.

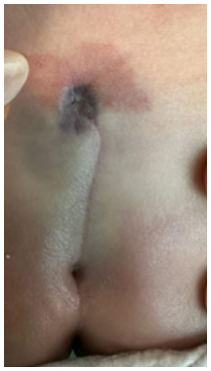


Image 7: Dermal sinus above and sacral dimple below.

Discussion

Occult spinal dysraphism is a condition resulting from failures in the embryonic development of the spinal cord and its adjacent structures. Although the defect is covered by intact skin, it is often associated with cutaneous stigmata. In this case, the presence of a dermal sinus and filum terminale lipoma is linked to tethered cord syndrome, in which the spinal cord is abnormally anchored, leading to chronic traction that may result in progressive neurological deficits. Imaging studies, particularly MRI, play a crucial role in diagnosis, allowing for detailed evaluation of spinal structures and the identification of anomalies that may not be apparent on initial physical examination [4].

This case highlights the importance of early identification of cutaneous stigmata as indicators of occult spinal dysraphism. Even though the patient presented no neurological symptoms at the time of the initial evaluation, the presence of dermatological signs prompted further imaging studies, which confirmed the diagnosis. This underscores the relevance of skin findings as markers of structural abnormalities in the vertebral column.

The decision to proceed with surgical intervention was based on the need to prevent potential neurological complications, such as central nervous system infection associated with the dermal sinus, and symptoms related to tethered cord syndrome, including muscle weakness, sensory disturbances, and sphincter dysfunction. Surgical removal of the dermal sinus and release of the filum terminale are standardized procedures aimed at relieving spinal cord traction and preventing the progression of neurological deficits. Although the patient was asymptomatic at the time of surgery, the literature suggests that early intervention can significantly reduce the risk of irreversible damage, particularly in children, whose developing nervous system is more vulnerable to prolonged traction.

Therefore, this case emphasizes the importance of close collaboration between pediatricians, neurosurgeons, and radiologists in achieving early diagnosis of occult spinal dysraphism, as well as timely and appropriate treatment to reduce the risk of current and future complications. Furthermore, postoperative follow-up is essential to monitor clinical evolution and detect potential complications, such as recurrence or new neurological deficits, which are indicators of a complete and effective treatment approach [5,6].

Conclusion

This case report underscores the importance of recognizing cutaneous stigmata as potential signs of underlying spinal disease, serving as criteria for further investigation. Of particular significance is the coexistence of two anomalies — dermal sinus and filum terminale lipoma — which is relatively rare. Additionally, it is evident that surgical intervention in such cases can prevent neurological complications, making early diagnosis critically important. A patient-centered approach that considers individual characteristics, along with multidisciplinary management, is essential to maximize outcomes and improve the quality of life of patients with occult spinal dysraphism.

References

1. Siqueira MG. Tratado de Neurocirurgia. Barueri: Manole. 2016.
2. IMIP, Pediatria. 4th ed. Rio de Janeiro: MedBook. 2011.
3. Coan AC, Ferreira LS, Schmutzler KMRS, et al. Condutas em

Neurologia Infantil. 4th ed. Rio de Janeiro: Thieme Revinter. 2024.

4. Martinez-Lage JF. Posterior fossa arachnoid cysts: surgical strategy and clinical outcome. J Neurosurg Pediatr. 2011; 8: 295-302.
5. Mankahla N, Figaji AA. Occult spinal dysraphism. SAMJ. 2025; 104: 316.
6. Martínez A. Lipomielomeningocele y médula anclada en un neonato. Arch Pediatr Urug. 2022; 93.