

Case Report

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Unusual presentation of antepartum lumbosacral plexopathy: A rehabilitation approach

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Abstract

Background: This case report focuses on a woman in her late thirties (gravida three para three) referred from Neurology to Physical Medicine & Rehabilitation department due to pain, lower limb weakness, walking difficulties, and dependence in daily activities. Her symptoms, which began during the second trimester of pregnancy, progressed from burning sensations in her feet to muscle weakness affecting her legs and thighs in the peripartum period.

Case presentation: Following delivery, diagnostic investigations indicated lower creatine phosphokinase levels, MRI findings showed muscle atrophy in the posterior compartment of both thighs, and an electromyography and nerve conduction study confirmed bilateral lumbosacral plexopathy.

Treatment and outcomes: Rehabilitation commenced six weeks postpartum, but the patient faced challenges due to her functional limitations. The treatment included a multifaceted approach encompassing medical management, physical therapy, and occupational therapy. Notably, the patient demonstrated significant improvement within two weeks of inpatient rehabilitation.

Conclusion: This case underscores the effective management of antepartum lumbosacral plexopathy using a comprehensive rehabilitation strategy. Early intervention and a multidisciplinary approach are pivotal in achieving positive outcomes in similar clinical presentations.

Keywords: Ante natal; Rehabilitation; Pregnancy; Antepartum plexopathy; Lumbosacral plexopathy.

Introduction

A multimodal approach and teamwork are indispensable to deliver optimal care for our patients. This report recounts the management of a woman who presented with a rare case of pregnancy-induced bilateral muscle atrophy in the thighs due to lumbosacral plexopathy, necessitating a progressive rehabilitation strategy.

Lumbosacral plexopathy during pregnancy is an infrequent condition, typically associated with a favourable outcome. It

often initiates with groin pain, followed by the onset of muscle weakness, primarily affecting the quadriceps and iliopsoas muscles, often accompanied by muscle atrophy. Sensory loss is less common. Electromyography (EMG) typically reveals denervation activity in muscles controlled by the upper part of the plexus, without paravertebral denervation activity [1].

The precise cause remains unknown. While postpartum femoral neuropathies and obturator nerve damage due to compression have been reported, the timing of symptoms in this case

suggests possible involvement of foetal pressure on the plexus in the aetiology [2,3]. Recovery may take several months, but the prognosis is generally favourable. Patients should undergo rehabilitation to manage disability during the critical antepartum and postpartum periods [4].

Case presentation

A woman in her late thirties, who had given birth to a healthy baby girl via caesarean section six weeks ago, was referred to the Neurology department due to complaints of pain and weakness in both lower limbs. She had a history of hyperemesis gravidarum in all her previous pregnancies and had delivered all her children via caesarean section. Examination revealed reduced muscle mass in both thighs, and further investigations indicated muscular atrophy in the posterior compartments of both thighs along with signs of lumbosacral plexopathy.

Upon admission to the Physical Medicine & Rehabilitation department, her functional abilities were assessed. She could independently transition from a supine to a sitting position but was completely dependent for sitting to standing, standing, and walking. Regarding Activities of Daily Living (ADL), she could independently manage feeding, grooming, and dressing but required moderate assistance for toileting. Her static and dynamic sitting balance were good, but her standing balance was poor.

During a motor examination, she exhibited 4/5 strength in both hip flexors, 2/5 strength in both hip extensors, 3/5 strength in both hip abductors and adductors, 3/5 strength in both knee flexors and extensors, and 4/5 strength in both ankle dorsiflexors and plantar flexors. The straight leg test produced positive results bilaterally. Sensory examination revealed impaired light touch and pinprick sensation L3 to S2 and left L4 to S2 dermatomes. Knee and ankle reflexes were diminished bilaterally. On per-rectal examination, her anal tone was normal, and deep anal pressure, voluntary anal contraction, Ano Cutaneous Reflex (ACR), and Bulbocavernosus Reflex (BCR) were intact. She exhibited continence for both bowel and bladder functions, and the rest of her examination yielded unremarkable findings.

The patient's blood investigations indicated normal CPK levels (22 U/L), plasma Vitamin D levels (27 ng/ml), and Vitamin B12 levels (438 pmol/L). Electromyography (EMG) revealed denervation of proximal hip and thigh muscles and nerve conduction studies (NCS) showed absent Compound Muscle Action Potential (CMAPs) in the left common peroneal nerve, severe reduction in the right peroneal nerve, and mild reduction in the right tibial nerve, along with the absence of F waves in bilateral common peroneal nerves; absence of sural Sensory Nerve Action Potential (SNAPs) bilaterally. MRI of the lumbosacral spine displayed a loss of lumbar lordosis, facet arthropathy at the L4-L5 and L5-S1 levels, and no evidence of demyelination (Figure 1). Additionally, MRI of both thighs indicated reduction in bulk of all muscles of both thighs with asymmetric predominance of posterior compartment muscles-compatible with myopathy without any features of myositis (Figures 2,3). These comprehensive findings played a crucial role in assessing the patient's condition and guiding further management.

The patient's comprehensive rehabilitation regimen encompassed both pharmacological and non-pharmacological approaches. In terms of pharmacological management, the

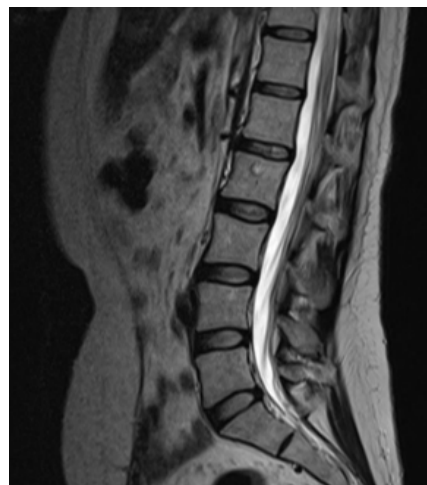


Figure 1: MRI Lumbo-sacral spine- No evidence of demyelination.

patient was prescribed a combination of topical and oral analgesics, muscle relaxants, multivitamins, and Vitamin D supplements to effectively address her symptomatic needs.

Non-pharmacological interventions played a pivotal role in her rehabilitation journey. These interventions included graded strengthening exercises targeting the back and hip girdle muscles, such as bridges and straight leg raises, with a protocol of 2 sets of 10-12 repetitions which was gradually increased. Active assisted range of motion exercises, bedside hamstring and quadriceps stretching exercises were performed, amounting to a cumulative six hours daily.

Furthermore, the patient engaged in two hours of prone lying, and employed two-kilogram ankle weights on both sides to enhance specific muscle groups.

The occupational therapy component of the rehabilitation program was focused on transfers and balance training, Activities of Daily Living (ADL), and functional activity retraining to restore independence and quality of life. Additionally, physical therapy incorporated stretching and strengthening exercises tailored to target the gluteal, hamstring, and quadriceps muscles. The patient also underwent aerobic training and program to enhance her standing ability with knee support and gradually transitioned to gait training with the assistance of a walker and standing without assistance (Figures 4,5).

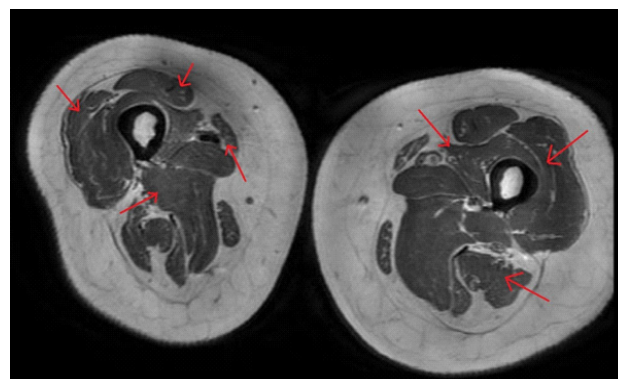


Figure 2: MRI of both thighs indicated reduced muscle bulk in all thigh muscles- gluteus, piriformis, obturator internus, obturator externus and quadratus femoris, with an asymmetric predominance of muscle loss in the posterior compartment.

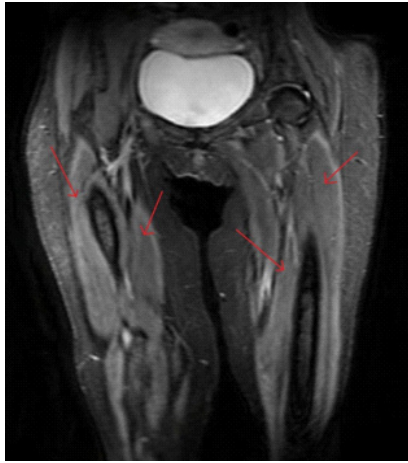


Figure 3: MRI bilateral thigh suggesting rectus femoris, vastus medialis, vastus lateralis and vastus intermedius muscles show atrophy bilaterally.



Figure 5: Day 20 of rehabilitation- independent standing.



Figure 4: Functional status after Day 14- Gait training with walker support.

Table 1: Comparison of functional outcome on admission and at discharge from Rehabilitation department.

Functional scales	Admission	Discharge
Functional Independence Measure (FIM)	58	119
Barthel index	60	85
Visual Analog Score (VAS)	8/10	2/10
Lower Extremity Functional Scale (LEFS)	17	72

symptoms in this specific case suggests that pressure exerted on the plexus by foetal parts may have contributed to its aetiology. In a similar case series by Delareua et al. three cases of antenatal lumbosacral plexopathy (LSP) were discussed, all of which presented symptoms in the third trimester of pregnancy with no prior neurological issues. Two of these cases occurred during their first pregnancy. Thorough neurological examinations were conducted, X-ray spine results were normal, MRI ruled out myelopathy, and EMG revealed denervation in proximal hip and thigh muscles. Following physical therapy, all patients achieved complete recovery within 3-6 months post-pregnancy [1]. However, a comprehensive understanding of the exact causative factors of this condition is yet to be determined. Although recovery may extend over several months, the injury is typically self-limiting, and patients can anticipate a favourable outcome. Nonetheless, a rehabilitation program is essential to effectively manage their temporary disabilities.

Conclusion

This case highlights the uncommon occurrence of lumbosacral plexopathy, emphasizing the need for vigilance regarding neurological complications during pregnancy. When such complications arise, a thorough evaluation, including a detailed medical history, comprehensive physical examination, and relevant diagnostic tests, becomes imperative to guide proper management. Regardless of the rarity of the presentation, a multimodal approach is crucial for effective care, underlining the significance of timely diagnosis and rehabilitation in both typical and unusual cases. In this evolving landscape, rehabilitation plays an ever-expanding role in addressing emerging trends and concepts associated with these atypical neurological presentations, reinforcing the importance of a holistic approach to patient care.

These synergistic therapies were designed to optimize the patient’s recovery and functional abilities. Architectural modifications were thoughtfully implemented to enhance safety and prevent falls, including the installation of grab handles and anti-skid mats.

Upon admission, the patient’s Functional Independence Measure (FIM) scored 58 out of 126, her Barthel index was 60 out of 100, she reported a Visual Analogue Scale (VAS) pain rating of 8 out of 10, and her Lower Extremity Functional Scale (LEFS) was 17 out of 80. However, at the time of her discharge, significant improvements were observed, with FIM at 119 out of 126, Barthel index at 85 out of 100, VAS pain rating reduced to 2 out of 10, and LEFS reaching 72 out of 80 (Table 1).

The patient attended outpatient follow-up appointments at 3 and 8 weeks after her discharge. During these visits, she demonstrated complete independence in her daily activities and exhibited the ability to walk independently, with only minor lingering neurological deficits.

Discussion

The precise origin of this condition remains unknown. Post-partum compression neuropathies, such as femoral neuropathies after delivery and obturator nerve damage, have been documented as potential contributing factors. The onset of

Human subjects: Consent was obtained by participant in this study.

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