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Comprehensive physiotherapy rehabilitation in post-injection sciatic nerve palsy in a child: A case study

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Abstract
Introduction: Post-injection sciatic nerve palsy is a preventable iatrogenic peripheral nerve injury, commonly reported in pediatric populations following improper intramuscular injections in the gluteal region. It often leads to foot drop, sensory deficits, and gait abnormalities. Early physiotherapy intervention is essential to prevent long-term disability.
Methods: A 5-year-old male child presented with right lower limb weakness and abnormal gait following an intramuscular gluteal injection. Clinical examination and nerve conduction studies confirmed sciatic nerve palsy. A structured 12-week physiotherapy rehabilitation program focusing on pain control, muscle re-education, strengthening, gait training, and functional activities was implemented.
Results: Significant improvements were observed in muscle strength, gait pattern, and functional mobility. The child progressed from ankle-foot orthosis–assisted ambulation to independent walking with near-normal gait.
Conclusion: Early and structured physiotherapy rehabilitation plays a critical role in functional recovery following post-injection sciatic nerve palsy in children.

Keywords: Post-injection palsy, sciatic nerve injury, pediatric physiotherapy, foot drop, rehabilitation

Introduction

Injection palsy is a significant iatrogenic cause of peripheral nerve injury, particularly in children, due to smaller muscle mass and underdeveloped anatomical landmarks [1]. The sciatic nerve, passing superficially through the gluteal region, is highly vulnerable to intramuscular injection trauma [2]. Common mechanisms of injury include direct needle trauma, chemical neurotoxicity from medications, and ischemia caused by local inflammation [3]. The resulting neuropathy may present as foot drop, impaired dorsiflexion, sensory deficits over the lateral leg and dorsum of the foot, pain, and abnormal gait [4, 5].

Epidemiological studies indicate that improper injection technique is the primary preventable factor, and pediatric patients are disproportionately affected due to anatomical considerations and lack of awareness among caregivers and healthcare providers [6]. Clinical outcomes vary from spontaneous partial recovery to long-term disability, depending on the severity of nerve damage and timeliness of intervention [7].

Physiotherapy plays a critical role in recovery by preventing joint contractures, maintaining muscle length, enhancing neuromuscular re-education, improving gait, and promoting functional independence [8, 9]. Early intervention has been shown to improve motor recovery and reduce the risk of permanent deformities such as equinus foot [5]. Despite its significance, there is limited literature on structured rehabilitation protocols for pediatric injection palsy, highlighting the importance of case reports to guide clinical practice [10, 11].

This case study aims to describe the physiotherapy management and functional outcomes in a child with post-injection sciatic nerve palsy.

Case Description

Patient Information

- **Age:** 5 years
- **Gender:** Male
- **Weight:** 16 kg
- **Medical History:** Unremarkable
- **Drug History:** Intramuscular injection administered in the right gluteal region for febrile illness at a local clinic

History of Present Illness

The child developed pain and excessive crying immediately after the injection. Within 24 hours, parents noticed difficulty lifting the right foot during walking and frequent tripping. The child was referred to physiotherapy after neurological evaluation confirmed sciatic nerve involvement.

Clinical Examination

Observation

- Visible foot drop on the right side
- Reduced weight bearing on the affected limb
- Mild calf muscle wasting

Motor Examination (MRC Scale)

Muscle Group	Right Side
Ankle dorsiflexors	1/5
Toe extensors	1/5
Ankle evertors	2/5
Ankle plantar flexors	4/5
Knee flexors/extensors	5/5

Sensory Examination

- Decreased sensation over lateral aspect of leg and dorsum of foot
- Intact plantar sensation

Reflexes

- **Ankle jerk:** Reduced
- **Knee jerk:** Normal

Gait Analysis
- High-stepping gait
- Absence of heel strike
- Compensatory hip flexion

Investigations
- **Nerve Conduction Study:** Reduced motor conduction velocity and amplitude of the right sciatic nerve
- **Ultrasound of Hip:** No hematoma or abscess
- **Diagnosis:** Post-injection sciatic nerve palsy

Physiotherapy Assessment and Problem List
1. Neuromuscular weakness of ankle dorsiflexors
2. Sensory impairment
3. Abnormal gait pattern
4. Risk of ankle plantarflexion contracture
5. Reduced functional mobility and participation

Physiotherapy Goals

Short-Term Goals
- Reduce pain and discomfort
- Maintain joint range of motion
- Initiate muscle activation

Long-Term Goals
- Restore ankle dorsiflexion strength
- Achieve independent ambulation
- Normalize gait pattern
- Prevent deformity and recurrence

Physiotherapy Intervention

Phase I: Acute Phase (Weeks 1–4)
- Pain-free positioning
- Passive and active-assisted ankle ROM
- Neuromuscular electrical stimulation to tibialis anterior
- Gentle stretching of gastrocnemius-soleus complex
- Sensory stimulation using textures and vibration
- Ankle-foot orthosis (AFO) for foot drop correction
- Parental education on home program and precautions

Phase II: Strengthening Phase (Weeks 5–8)
- Active dorsiflexion exercises against gravity
- Theraband resistance exercises
- Play-based strengthening activities
- Weight-bearing activities in standing
- Balance training using dynamic surfaces
- Gait training with AFO

Phase III: Functional Phase (Weeks 9–12)
- Progressive gait training without AFO
- Stair climbing and obstacle negotiation
- Running, hopping, and jumping activities
- Endurance and coordination training
- Functional play integration

Outcome Measures

Outcome	Baseline	12 Weeks
Ankle DF Strength	1/5	4/5
Sensation	Impaired	Improved
Gait	Foot drop	Near normal
AFO Dependency	Required	Not required
Functional Mobility	Dependent	Independent

Discussion

Post-injection sciatic nerve palsy is preventable but remains a common cause of pediatric peripheral nerve injury, particularly in low-resource settings where intramuscular injections are routinely administered [1, 2]. Direct needle trauma, neurotoxic effects of medications, and ischemia are primary mechanisms of injury [3, 4]. The clinical presentation typically includes foot drop, sensory impairment, and abnormal gait, as observed in this case.

Early physiotherapy intervention is essential for optimal recovery. Electrical stimulation of the tibialis anterior promotes early motor activation and prevents disuse atrophy [12]. Passive and active-assisted exercises maintain joint range of motion and prevent secondary contractures [13]. Progressive strengthening, proprioceptive exercises, and gait training facilitate functional recovery and independence [8, 14]. Orthotic support during early rehabilitation ensures safe ambulation and prevents compensatory gait deviations [15].

Play-based therapy is particularly effective in pediatric populations, as it encourages engagement, adherence, and motivation, thereby improving outcomes [16]. Parental education on home exercise programs and positioning strategies also significantly contributes to recovery [17].

The favorable outcome in this case aligns with previous studies, emphasizing the importance of early and structured physiotherapy in pediatric injection palsy [5, 6, 10]. Timely intervention can prevent permanent disability and ensure restoration of normal gait and function.

Conclusion

Post-injection sciatic nerve palsy is preventable but can cause significant functional disability in children. Early and structured physiotherapy rehabilitation, incorporating neuromuscular re-education, strengthening, gait training, and play-based interventions, can result in substantial functional recovery and independence.

Clinical Message
- Injection palsy is preventable with proper technique
- Early physiotherapy improves motor recovery and gait
- Pediatric rehabilitation should be play-oriented and structured
- Awareness of safe injection practices is essential

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