

Post Injection Sciatic Neuritis: A Case Report

VENKATESH MANCHIKANTI¹, NIHARIKA PRASAD², KLN SINDHUJA³, RAJESH BOTCHU⁴



ABSTRACT

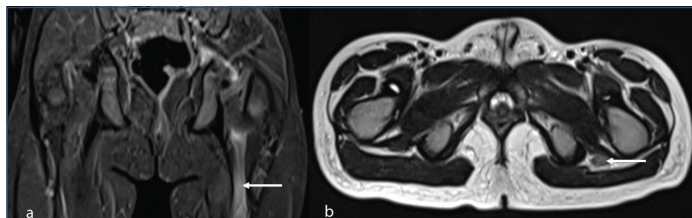
For administration of certain drugs, intramuscular injections are used in children. The dorsogluteal area between the iliac crest and the greater trochanter is the most suitable site for intramuscular injection. Due to the poor co-operation of children/wrong technique/lack of trained personnel, there may be a risk of damage to sciatic nerve. A four-year-old boy presented with four day history of left foot drop. He had history of fever for which he consulted a local untrained medical practitioner and received an intramuscular injection at left gluteal region. Magnetic Resonance Imaging (MRI) of pelvis and proximal thigh was performed and showed thickened and increased T2W signal of left sciatic nerve with perineural T2W hyperintensities suggestive of Sciatic Neuritis. Sciatic nerve injury can be potentially devastating, resulting in foot drop due to loss of dorsiflexion of the foot. The most common presentation is a paralytic foot drop that is caused due to involvement of the peroneal division of the sciatic nerve. Imaging of the sciatic nerve by MRI helps in early diagnosis and can assess the extent of involvement.

Keywords: Iatrogenic neuritis, Intramuscular injection, Left foot drop

CASE REPORT

A four-year-old boy presented with four day history of left foot drop. He had history of fever for which he consulted a local medical practitioner and received an intramuscular injection at the left gluteal region. He had mild pain at the injection site for a day. Fever subsided and gradually over a period of four days he developed weakness in his left lower limb with complete foot drop. On clinical examination posterior aspect of thigh was swollen with limited restriction of movement.

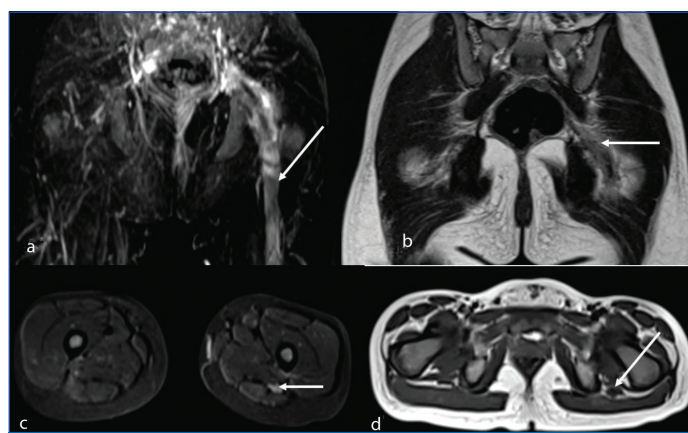
A MRI was advised after clinical assessment for evaluation of sciatic nerve. MRI of pelvis and proximal thigh was performed. Coronal and Axial Short T1 Inversion Recovery (STIR) images at the level of greater sciatic foramen showed thickened and increased T2W signal of left sciatic nerve with perineural T2W hyperintensities [Table/Fig-1]. Coronal and axial images of entire sciatic nerve in the pelvis and at mid-thigh level showed diffuse thickening of left sciatic nerve with T2W hyperintense signal suggestive of neuritis [Table/Fig-2]. No fatty infiltration of muscles was seen on T1 weighted images. Sciatic nerve fibers were continuous and there was no neuroma formation. He was managed conservatively with physiotherapy and foot drop resolved over four weeks. Now the patient is able to walk normally without support.



[Table/Fig-1]: Coronal Three Dimensional (3D) STIR Maximum Intensity Projection (MIP) (a) and Axial (b) T2 images of pelvis at the level of greater sciatic foramen showing enlarged and increased signal intensity of left sciatic nerve (arrows). Adjacent thigh and gluteal muscles are normal in bulk and signal.

DISCUSSION

Sciatic nerve arises from the anterior and posterior roots of L4 to S3. Anterior divisions form tibial division and posterior divisions form the peroneal division. The peroneal component lies lateral to the tibial component [1]. It courses through the greater sciatic foramen, inferior to piriformis and between the ischial tuberosity and greater



[Table/Fig-2]: Coronal STIR MIP (a), T2 (b) and Axial STIR (c), showing diffuse thickened and increased signal of entire sciatic nerve till mid thigh level. Axial T1 (d) shows thickened hypointense sciatic nerve with normal muscle bulk and signal of gluteal muscles.

trochanter of the femur. There are spinal, non spinal and iatrogenic causes for the sciatic nerve injury. Hip arthroplasty followed by intragluteal injections are most common iatrogenic causes of sciatic nerve injury [2]. According to a study by Kline DG et al., iatrogenic injection injury was most common mechanism affecting sciatic nerve at gluteal region, accounting for more than 50% of the cases (136 out of 230 patients) [3]. Its incidence is higher in developing countries. Sciatic nerve injury is a serious complication of intramuscular injection. Dorsogluteal site (upper outer quadrant) is mostly associated with traumatic injury as the sciatic nerve courses through the middle of gluteal region. Due to poor co-operation of children/wrong technique/lack of trained personnel, there may be a risk of damage to sciatic nerve [4]. As the peroneal division is lateral in position it is more frequently injured. The nerve injury is due to the vitriolic action caused by the drug, ischemia and direct needle trauma [5]. Kadioglu HH, suggested that careful periodic training of health care professionals about safe injection practice and administering with utmost care in choosing the site of injection for a drug helps in minimising the iatrogenic sciatic nerve injury [6].

The time of onset and extent of symptoms may vary in the patients depending on the site of injection- intrafascicular or extrafascicular. In about 90% of patients, there is an immediate onset of symptoms

and delayed onset in 10% that appears from minutes to hours after injection [7]. Delayed onset of symptoms with no or minimal nerve injury is due to the extrafascicular site injections and immediate onset of symptoms with minimal to severe nerve damage in the intrafascicular site injections. It also depends on the agent used and its dosage [8]. Pain of varying intensity and gait abnormality are the most common reported symptoms. There may be associated foot drop, contracture of the hip, equinus deformity, motor weakness, paresthesias and numbness [9,10].

Foot drop is the common presentation as the peroneal division is frequently involved. Loss of dorsiflexion of foot and toes and weakened inversion of the foot is seen when tibial division is involved [11]. Neuroma formation can be seen with extensive nerve damage.

The diagnosis is made based on Electromyography (EMG) and MRI. EMG is done using concentric needle electrode. It shows signs of acute denervation as positive spontaneous fibrillation, high insertion activity and sharp waves with recruitment and low interface in affected muscle. Chronic denervation is seen as polyphasia, lowered interface pattern, and high amplitude. MRI shows T2W hyperintensity at the site of nerve damage. Neuroma is seen as T2W heterogeneously hyperintense fusiform swelling of nerve endings. The subtle changes of inflammation can be deciphered early as T2W hyperintense signal on T2 and STIR sequences. Depending on the severity of the injury, there may be T2W high signal intensity of the nerve fibres or deformation of nerve/increase in dimension/loss of nerve integrity. STIR sequence helps to identify the extent of lesion diffuse area of increased T2W signal indicates inflammatory aetiology [12]. Affected muscles show fatty infiltration and atrophy of muscles on T1. In present case, the patient presented with foot drop, four days following the injection. There was T2W hyperintensity all along the course of the sciatic nerve in the hip region up to mid-thigh. The treatment options include analgesics, physiotherapy, use of limb braces and/or operative exploration based on the severity of injury and presenting symptoms [13]. Surgical exploration is advised only if injury is severely incapacitating. Neuropraxia carries a good prognosis and surgical intervention is not indicated. Early exploration can be done only if patient has intractable pain or with clinical

evidence of neurotmesis [14]. In present case, patient was managed conservatively and recovered completely over 4-6 weeks.

CONCLUSION(S)

Dorsogluteal site of intragluteal injection risks sciatic nerve injury which can be a significant complication. The severity and the time of onset of symptoms depend on the site of neural involvement i.e. whether it is intrafascicular or extrafascicular. Peroneal division is more frequently involved causing foot drop. MRI helps in detecting severity and extent of the nerve injury.

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PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Radiology, Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India.
2. Assistant Professor, Department of Radiology, Dr. DY Patil Medical College Hospital and Research Centre, Pune, Maharashtra, India.
3. Assistant Professor, Department of Radiology, Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India.
4. Consultant Musculoskeletal Radiologist, Department of Radiology, Royal Orthopaedic Hospital, Birmingham, United Kingdom.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Venkatesh Manchikanti,
Assistant Professor, Department of Radiology, Narayana Medical College and Hospital,
Nellore, Andhra Pradesh, India.
E-mail: drvenki143@gmail.com

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