Case Report

Low trauma posterior native hip dislocation with acute longitudinal transverse myelitis due to SARS-CoV-2 - A case-report

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ABSTRACT

Background: Native hip dislocations are most commonly seen after high energy trauma. While there are documented cases of hip dislocation with associated stroke, we present a case of posterior hip dislocation in the context of acute longitudinal transverse myelitis due to a rare presentation of SARS-CoV-2.

Case report: A 60-year-old male presented with bilateral lower limb weakness with a shortened internally rotated left leg. Plain radiographs revealed a posteriorly dislocated native left hip and MRI of the spine showed acute longitudinal transverse myelitis of the cervical and thoracic regions. His nasopharyngeal swab was positive for SARS-CoV-2. His hip was reduced, and he was treated with intravenous steroids. His neurological symptoms improved with follow-up MRI showing resolution of the transverse myelitis.

Conclusion: This case illustrates a classic orthopaedic emergency in the context of a rare presentation of SARS-CoV-2, and the vigilance that orthopaedic doctors must have when examining patients with lower limb neurological deficit.

Introduction

The majority of native hip dislocations occur after motor vehicle collisions [1]. Although hip subluxation and dislocation occur commonly in neuromuscular diseases such as cerebral palsy, spinal muscular atrophy and myelomeningocele, they are not known to affect patients with transverse myelitis. There have been case reports on anterior native hip dislocation secondary to stroke [2] and many studies show increased incidence of Total Hip Replacement dislocation in patients with neurological condition like Parkinson's disease. We present an unusual case of posterior hip dislocation from a trivial fall from standing height in a patient that, after investigations, was found to have acute longitudinal transverse myelitis and SARS-CoV-2.

Case report

History

A 60-year-old gentleman was admitted under our care presenting with weakness of both legs. He had presented to the emergency department 2 days prior complaining only of lower abdominal pain. He was found to be in...
urinary retention and was catheterised, treated as a urinary tract infection with antibiotics, and discharged. In the following 2 days he complained of an increasingly unsteady gait with tingling in both his hands and feet. This culminated in a simple fall while trying to get out of bed on the morning before the day of admission. He was unable to mobilise after this point.

Examination revealed an internally rotated and shortened left leg however, he was able to perform straight leg raise to some extent. Hypotonia was noted in both lower limbs. Bilateral distal upper limb weakness graded 4/5 and lower limb weakness graded 3/5 proximally and 2/5 distally. He had sensory deficit level of T12 on the Right and L2 on the Left, reduced vibration sensation up to the knee and abolished lower limb reflexes. His cranial nerve examination was normal and other systemic examinations were unremarkable.

Prior to his initial attendance to the emergency department the patient had been well with no urinary, respiratory or cardiac symptoms in the preceding weeks. The patient had no prior medical history of note and wasn’t on any regular medication.

**Investigations**

Radiographs of the left hip (Figs. 1, 2) revealed a posteriorly dislocated native hip with no obvious associated bony injury. T2 weighted Magnetic Resonance Imaging with gadolinium contrast of the whole spine revealed extensive spinal cord signal abnormality predominantly involving the cervical and lower thoracic regions including the conus suggestive of longitudinal acute transverse myelitis (Fig. 3). Computer Tomography of the chest revealed Left lower lobe consolidation with peripheral areas of ground glass change in the Right lung.

Nasopharyngeal swab for SARS-CoV-2 was positive with initial blood tests showing a raised C-Reactive Protein (CRP) but white cell count and lymphocytes were within normal ranges. Full autoimmune screen, onconeuronal antibodies, anti myelin oligodendrocyte glycoprotein (anti-MOG) and aquaporin 4 antibodies were all negative.

Results of Cerebrospinal Fluid analysis and further laboratory test can be seen in Table 1.

**Treatment**

He was taken to theatre to successfully reduce his hip (Fig. 4) and was commenced on intravenous methylprednisolone for which he received a total of 4.5 g followed by high dose prednisolone. His folate and vitamin B12 were also replaced and was kept on bed rest for 2 weeks prior to being mobilised by the physiotherapists. Three weeks after admission, a new leg length discrepancy was noted, and x-rays confirmed a re-dislocation of the Left hip. The patient did not complain of any pain which is most likely due to sensory loss caused by transverse myelitis. This was again successfully reduced in theatre. Computer tomography ruled out any fracture or bony injury.

**Outcome and follow-up**

The patient was kept on bed rest with a de-rotation boot. Daily leg length measurement was carried out with comparison to the normal side. Repeat T2 Weighted Magnetic Resonance Imaging 6-weeks after admission reported complete resolution of previously seen cord signal change (Fig. 5). The patient's sharp and soft touch sensory loss and motor weakness had completely resolved. The patient underwent inpatient physiotherapy during his 12-week hospital admission before being discharged to continue rehabilitation.

**Fig. 1.** Antero-Posterior plain radiographs showing posterior dislocation of the Left hip with no obvious bony injury.
Fig. 2. Lateral radiograph showing posterior dislocation of the Left hip with no obvious bony injury.

Fig. 3. Magnetic Resonance Imaging T2 weighted images from admission showing extensive spinal cord signal abnormality predominantly involving the cervical and lower thoracic regions.

### Table 1
Relevant bloods tests, cerebrospinal fluid analysis and nasopharyngeal swab results taken on admission.

| CSF analysis                  | Blood tests                  |
|------------------------------|------------------------------|
| Appearance Clear colourless fluid | Haemoglobin 148 Sodium 134 |
| Red blood cells <1          | White cell count 8.1 Potassium 3.6 |
| White blood cells <1        | Platelet count 166 Urea 7.7 |
| Gram stain No organism seen | Haematocrit 0.432 Creatinine 76 |
| Culture No growth           | MCV 94 eGFR 89              |
| Protein 514                 |                              |
| Glucose 3.1                 | Neutrophil 6.2 INR 1.3      |
| Lymphocytes 1.0 APTT 25     |                              |
| Basophils 0.2               |                              |
| SARS-CoV-2 RNA Positive     | Eosinophils 0.2             |
| SARS-CoV-2 RNA              | Basophils 0.0 B12 202       |
| CRP 99                      | Folate 4.1                  |
| ESR 78                      | Copper 14                   |
in the community. Unfortunately, the patient re-dislocated his hip shortly after being discharged, so has required further manipulation under anaesthesia. His further plan will be to refer him to tertiary level specialist centre managing such hip conditions.

Discussion

As far as authors are aware, this is the first case of posterior hip dislocation secondary to transverse myelitis which probably occurred secondary to Covid 19 infection. There have been 4 case reports of acute transverse myelitis presenting with Covid 19 infection since the start of this pandemic [3–6].

The hypotonia and weakness due to this neurological condition and mechanism of fall might have led to posterior dislocation of the hip.

There was a delay in hip reduction due to the delay in diagnosis. This was complicated by the neurology in lower limbs and the fact that patient was able to SLR to some extent without significant pain. There was a need of diagnosing underlying neurological cause with MRI prior to taking the patient to theatres. Most authors recommend a reduction time of fewer than 6 h, while there is some evidence that fewer than 12 h may be a critical time; regardless, the rate of secondary complications increases dramatically with increased time-to-reduction [7].

There have been case reports on anterior native hip dislocation secondary to stroke [2], hip dislocation in spinal muscular atrophy [8] and many studies showing increased incidence of THR dislocation in patients with neurological condition like Parkinson’s disease.

Phen et al [9] reported a case of simultaneous bilateral central hip dislocation in a 69-year-old patient. The authors postulated the cause being due to convulsions relating to a stroke. The presence of hypertonia in the affected limb combined with a load across an abducted joint may have been the key factors resulting in this dislocation.

We stress here the importance of measuring daily leg-length in such cases where pain is masked by underlying neurological problem and absent pain sensation/joint proprioception. There should be a multi-disciplinary approach to manage such conditions with input from neurology, physiotherapists, occupational therapists and orthopaedic surgeons.

Conclusion

Although this case report represents an outlier in the grand scheme of hip dislocations, it is an interesting and atypical presentation of a classic emergency diagnosis in orthopaedics. While we continue to learn about the SARS-CoV-2 pandemic and its varied presentations, we must be aware of its neurological complications which can in turn affect the musculoskeletal system as above.

Learning points:

• This case depicts an uncommon injury pattern caused by a low-energy mechanism in conjunction with acute transverse myelitis.
• This serious injury can be missed when associated with the more obvious features of spinal symptoms like weakness in legs, hypotonia and bladder disturbances at presentation and the consequent delay in reduction can lead to a poor outcome.
• A multidisciplinary approach is important when managing patients with acute medical and orthopaedic problems.
• Limb length measurement is essential in hip dislocation due to neurological conditions.

Patient perspective

Fig. 4. Intraoperative image intensifier radiograph showing successful reduction of the left hip.
‘It has been a long and drawn-out experience, especially the first month when I was confined to bed rest. All I wish I could do is get up and start walking and the thought kept coming to my head, will I ever walk again? It was a real boost when I was told the inflammation in my spine had gone. I saw light at the end of the tunnel at this point but with the hip re-dislocating at home I feel like I’m back to square one.’

The authors declare that there is no conflict of interest.

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Fig. 5. Magnetic Resonance Imaging T2 weighted images from 6 weeks after admission showing resolution of changes previously seen on MRI from admission.