

# Misdiagnosis of fracture-dislocation of the lumbar spine in a child: technical note.:

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## Abstract

Spinal injuries constitute about one-fiftieth of all injuries in children. About half of these injuries have associated neurological deficits. In children below the age of four years, the diagnosis is made difficult because of communication. The clinician must rely on hearsay to obtain a history. Diagnostic imaging may present difficulties because most Radiologists are not familiar with the anatomy and developmental abnormalities of the spine in young children. This 20-month old child presented with significant other injuries to warrant thorough spinal imaging. Magnetic resonance imaging and computed tomography scan gave conflicting reports. A misdiagnosis of fracture-dislocation of the upper lumbar spine occurred. Repeat investigations should be seriously considered where radiological investigations do not agree with the clinical picture in order to avoid mismanagement.

## INTRODUCTION

Spinal injuries are very rare injuries in children. They constitute about 2% - 3% of all injuries in children<sup>1</sup>. Fractures are rare in children below the age of eight years, and about 50% present with neurological injuries<sup>2</sup>. The lumbar spine is rarely involved<sup>1</sup> About 3% of abused children suffer from spinal injuries, mostly in the cervical spine<sup>3</sup>.

Diagnostic imaging plays a crucial role in the diagnosis of spinal injuries in children. Ordinary x-rays may not detect subtle injuries because most of children's bones are made of cartilage. However, it is very crucial that the clinician must interpret the findings within a given clinical context.

Advanced imaging like computed tomography scan (ct scan) or magnetic resonance imaging (mri) may give false images.

We report on a case of a misdiagnosed fracture- dislocation of the upper lumbar spine in a 20 month-old child.

## CASE REPORT

A 20 month-old child was run over by a low-velocity minibus taxi. On arrival at the hospital she was in a stable clinical condition. She had no head, neck, chest and abdominal injuries. The pelvis was tender and she had abrasions and a Morel-Lavallee lesion involving the posterior aspect of the pelvis and the whole lumbar spine. The whole lumbar region was clinically tender. Per vaginum and rectal examinations revealed blood. She had a normal

rectal tone. She had slight movements of the knees and ankles. Full neurological examination could not be done due to communication problems. X-rays of the pelvis showed disruption of the symphysis pubis, fracture of the left ilium plus disruption of the ipsilateral sacro-iliac joint. The thoraco-lumbar spine was poorly visualized, but appeared normal ( figure 1)

**Figure 1**

Figure 1: X-rays of the thoraco-lumbar spine show normal appearance of the upper lumbar region.



A multi-detector computed-tomography scan (md ct-scan) was requested. The report stated that there was a fracture-dislocation of the upper (L1/L2) lumbar spine (figure 2)

**Figure 2**

Figure 2: An artifact demonstrated by the CT-SCAN at the upper lumbar region misdiagnosed as a fracture-dislocation.



Because of the rarity of the injury in our setting, we requested a review of the MD CT-SCAN by the most senior colleagues. The opinion did not change. We decided to request MRI. It was done two weeks after injury. The report stated that the MRI was normal ( figure 3).

**Figure 3**

Figure 3: Sagittal view of T2-Weighted image shows a normal MRI.



We re-consulted our colleagues to review all radiological investigations done so far: x-rays, CT-SCAN and MRI. The opinion was still the same.

Intra-operative findings were not consistent with CT-SCAN and MRI reports: there was fibrosis plus soft tissue oedema in the lumbar region, no fractures or listhesis involving L1/L2, normal LI/L2 joint capsules and no fractures identified. We requested another review of all investigations in the light of our operative findings. All radiological investigations were reviewed critically. The final report was that the 'fracture-dislocation' was, in fact, an artifact. The most plausible explanation for the artifact was the movement of the child during examination. There were no metals or any other foreign bodies that could account for the artifact. On close scrutiny of the CT-SCAN one can see that there is distortion of the soft tissues in the lumbar region. The bony elements in the upper lumbar spine also show artifacts. There are no bony lesions that show fractures or fracture-dislocations. The uncertainty could have been resolved by repeating the investigations.

## DISCUSSION

The patient had serious injuries and mandated thorough spinal evaluation. Low velocity car accidents usually do not cause spinal cord injuries in children<sup>4</sup>. However, they may cause significant bony injuries. Neurological evaluation in a pre-verbal child (less than four years) can be difficult to evaluate due to communication problems. Clinical evaluation and special investigations are the only tools available to the clinician to make a diagnosis. This places a clinician in a very difficult position because special investigations findings cannot be related to the full clinical picture. Misdiagnoses may occur as in this case.

Trauma is the commonest cause of morbidity in children<sup>5</sup>. MDCT SCAN is the preferred initial mode of investigation in blunt spinal trauma<sup>6</sup>. MRI is done in cases where definition of soft tissue is desired, or in cases where the normal x-rays and CT SCAN findings are in conflict. The specificity and sensitivity of MRI in defining soft tissue injuries in children is not known.

The incidence of misdiagnosis of cervical spine injuries in children less than 8 years of age is 24%<sup>7</sup>. The incidence of misdiagnosis of thoraco-lumbar spine injuries due to artifacts is not known. Thoraco-lumbar injuries are very rare in children, and most radiological units have little experience in interpreting such injuries in children.

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