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Case Report

Surgical treatment of cervical unilateral locked facet in a 9-year-old boy: A case report

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Abstract

Most of the cervical spine injuries in the pediatric population are typically seen in the upper cervical region. Unilateral cervical facet dislocation (UFD) in subaxial region is a rare injury in pediatric population. In this paper, a rare case of delayed locked UFD in a 9-year-old boy with rare injury mechanism treated surgically is reported. Clinical and radiological findings were described. The patient with C6-7 UFD without neurologic deficit was underwent open reduction and internal fixation via anterior and posterior combined approaches. Significant improvement of pain and free motion in cervical spine was obtained. There was no complication during the follow up. Only three case reports presented about the lower cervical spine injury with UFD under the age of 10 were found in the literature.

Key words: Cervical spine, surgical treatment, unilateral locked facet joint

INTRODUCTION

Cervical spine trauma in childhood is found to be about 1.5% in traumatic injuries.[1] The motor vehicle accidents are one of the major reasons for cervical spine injuries (especially upper cervical spine) in 0-9 age group, whereas sports injuries are one of the major reasons for cervical spine injuries (especially lower cervical spine) over the age of 10.[2-4] Some factors such as larger head, underdeveloped neck musculature, partially ossified wedge-shaped vertebral bodies and more angled facet horizontally, ligamentous elasticity make the upper cervical more sensitive to spine injuries under the age of 10. From the age of 10, cervical spine is characterized by adult cervical spine features.[4]

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The younger age group (aged 0-10 years) is more prone to upper cervical spine facet dislocations. However, UFDs in the lower cervical spine are found to be less common in this age group in the literature.[5-7] This article presents a 9-year-old boy who suffered from locked UFD without neurological deficits. He was treated surgically via anterior and posterior combined approach after failed conservative treatment.

CASE REPORT

The case was 9 years old and suffered from a rare injury mechanism. The head of the boy had been entrapped and squeezed by the automatic sliding garage door and he had tried to pull back his head forcefully [Figure 1]. After the injury, he had been brought to local hospital for the neck pain. After the clinical and radiologic examination, C6-7 UFD was diagnosed and tried to treat with cervical collar. Because of the unresolved neck pain and limited motion of the neck, the patient admitted to our center after three months of injury. There was no focal neurologic deficit and injury of the other systems on physical examination. The locked facet dislocation between the C6-7 level and anterolisthesis of C6 and loss of cervical lordosis were seen on X-ray. There was left locked UFD without associated fracture on three-dimensional

computerized tomography (3D-CT), and no disc and spinal cord (SC) damage on magnetic resonance imaging (MRI) was seen [Figure 2]. Due to the delayed dislocation, no closed reduction attempt was tried and surgical treatment was planned. Motor evoked potential (MEP) monitoring was used during the surgery. Posterior approach was performed first. After partial laminectomy, ligamentum flavum excision and left facet joint reduction with the help of lamina spreader was performed; fixation was obtained by C5-C7 posterior instrumentation. In the same stage, C6-7 discectomy, cage implantation and C6-7 anterior plating was performed via anterior subaxial approach [Figure 3]. No MEP changes were observed during surgery. Reduction was checked with early postoperative X-ray. Cervical collar was used for 3 weeks and then released. Three months after the surgery, there was no pain with motion and fusion was seen in the first third month control [Figure 4]. No complications developed during the follow-up.

DISCUSSION

UFD is more common in adults than in children and occurs as a result of flexion-rotation forces leading to partial or complete damage to interspinous, posterior longitudinal ligament, capsule and disc in the cervical spine.[5,7] The motor vehicle accidents and sports injuries are common reasons of the cervical spine injuries.[2] But there was a very rare injury mechanism in this case. After the head of the boy had been entrapped and squeezed by the sliding door, he tried to pull it back forcefully. Pulling out the head suddenly and forcefully toward back may have created flexion and rotation movements on the cervical spine.

In the presence of neck pain and restricted motion, cervical spine should be cleared. The clearing process always requires a complete clinical evaluation, and occasionally warrants adjunctive imaging. If there is any suspicion, diagnosis should be confirmed by CT and MRI in addition to direct X-rays.

While the surgical treatment is the first preferred method by most surgeons in adult patients, closed reduction is performed in children in the absence of neurologic deficit because of the growing and healing potential of the children.[7-9] A case with similar injuries without neurologic deficit and treated with closed reduction under general anesthesia was published by Prada *et al.*[7] Due to the delayed case, no closed reduction attempt was tried. Fibrotic tissue occurring after the injury can damage to SC and make a mechanical barrier for reduction in delayed cases without neurologic deficit. Surgical intervention was performed under neuromonitorization for this case. Chen

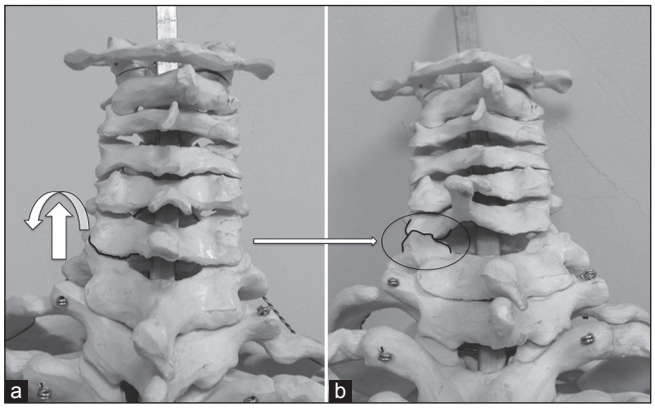

Figure 1: (a) Injury mechanism: distraction and rotation (b) left unilateral facet dislocation of C6-7

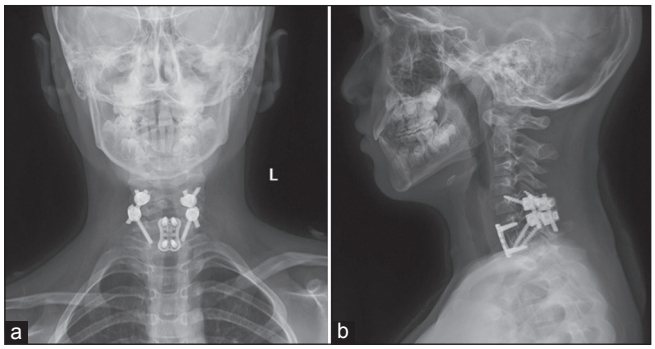

Figure 3: Postoperative (a) anteroposterior (b) lateral X-ray

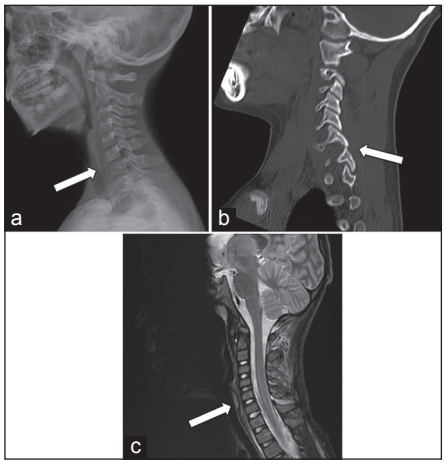

Figure 2: (a) The facet dislocation between C6 and C7 and anterolysthesis of C6 and loss of cervical lordosis were seen on lateral cervical X-ray. (b) Left unilateral facet dislocation was observed on CT; (c) there was no associated SC damage on MRI

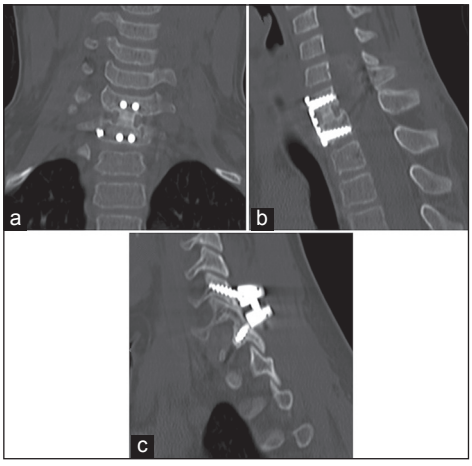

Figure 4: Interbody fusion on a) coronal and b) sagittal CT imges c) facet fusion on sagittal CT image

et al. reported an article about a 22-month-old child with UFD and neurological deficit and without disc damage on MRI. After failed closed reduction, posterior reduction and fixation had been performed, and good results were reported.[5] Hott *et al.* presented a case of 10-month-old infant with neurologically intact C6-7 UFD. Although failed closed reduction they applied conservative treatment with custom-made orthotics. At the 2-month follow-up normal cervical alignment and at the end of the 18-month follow-up, no instability on the dynamic radiographs had been reported.[6] UFD in childhood has rarely been reported. So the treatment of this kind of injury has still been unknown exactly. Posterior approach was chosen first in order to achieve direct reduction and to increase the stability anterior approach was performed in the same session. It is thought that to obtain rigid fixation in this delayed case would prevent the instability and redislocation.

During the follow-up, no complication was observed. But in patients who underwent cervical fusion, malalignment and adjacent segment degeneration may occur. McGrory *et al.* presented that after surgical fixation of fractures and dislocations of the cervical spine, osteoarthritic changes occurred in the adjacent segments as a long-term complication.[10] However, surgical fixation is required for the case of recurrent instability, failed closed reduction, irresponsible to conservative treatment and delayed diagnosis.

Unilateral cervical locked facet is a rare injury in pediatric population especially under 10 of age. Because of its rarity, there is no consensus about the treatment. Also these injuries can be seen as a result of rare injury mechanism and a detailed radiologic examination should be carried out not to overlook an accompanying pathology. Surgical treatment should be preferred in the presences of locked and delayed UFD cases especially. The long term results of surgical intervention should be strictly followed for adjacent segment degeneration.

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