Type 1 Dens Fracture with Atlantoaxial Subluxation Induced Spinal Cord Injuries in Children --- A Case Report and Literature Review

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小兒第一型齒狀突骨折合併寰樞椎滑脫之脊髓損傷-個案報告及文獻回顧

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Abstract

- The diagnosis and management of cervical spine injury in children is more complex than adults. Besides, the mechanism of injury, congenital variations, should also be considered. Here we present a case with type 1 dens fracture and axis-atlantal subluxation revealed ASIA grade B injury initially , patient gradually recovered after surgical intervention with occipito-cervical fixation and medical treatment. Literature review was also performed to clarify the key point of managements in such condition.

History and Clinical course

- The 12-year-old boy suffered from neck pain with left side weakness and numbness after slipping down with ASIA grade B injury initially. Neck pain with radiation to occipital area and sting-like sensation over ear and anterior upper chest wall area and he felt numbness below chest level. Muscle power decreased dominantly, right arm are 3/5 , right leg are 4/5, left arm are 1/5, left leg are1/5.

History and Clinical course

- Cervical spine MRI showed C2 type I fracture accompanied with C1-2 subluxation induced spinal cord compression & cord contusion at C1 level(Fig1.).
- Initial medical treatment followed the protocol of NASCIS III. Occipito-cervical fusion accompanied with C1 laminectomy was performed(Fig2.).

History and Clinical course

- After operation and rehabilitation, muscle power improved to right arm 4/5 , right leg 4/5, left arm 3/5, left leg 4/5 2 months after treatment and sensation also recovered gradually.

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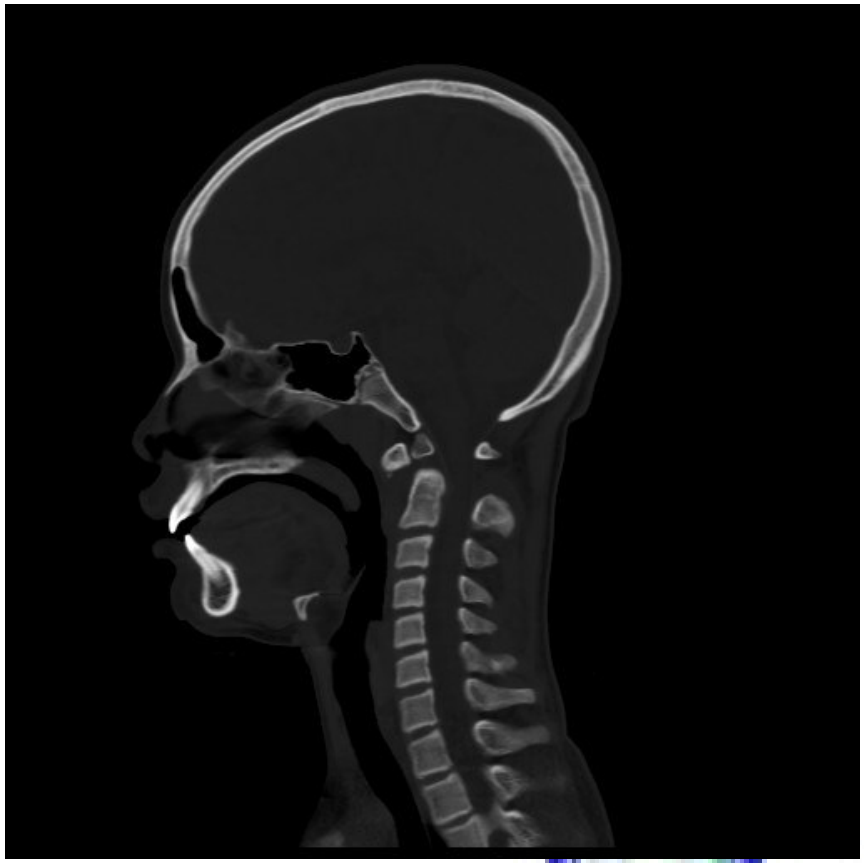
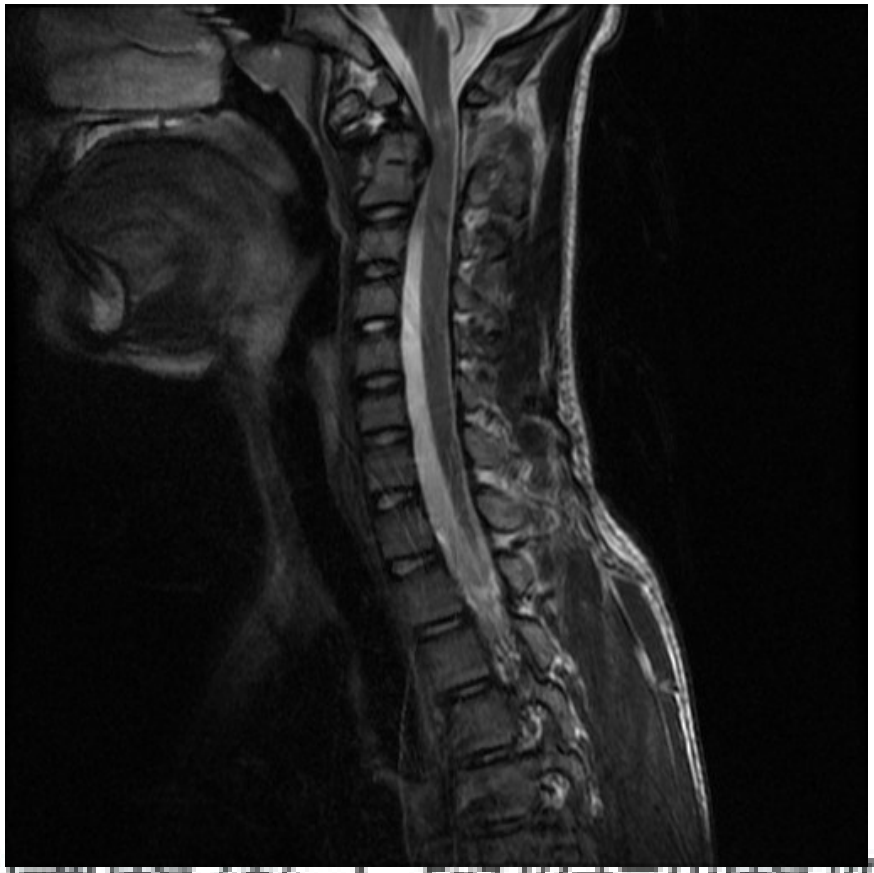
Image Fig1





CT

MRI

Image Fig2

POST OP

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Discussion

- The diagnosis and management of cervical spine injury is more complex in children than in adults. Children have several common variations in their anatomy, such as pseudosubluxation of C2–C3, widening of the atlantodens interval, and ossification centers.

Discussion

- There are four ossification centers at C2, the two neural arches, the body of C2, and the odontoid. The body of C2 fuses with the odontoid between 3 and 6 years of age, and this fusion produces a synchondrosis that is visible until 11 years of age and appears similar to a fracture. The os terminale at the tip of the odontoid is a secondary ossification center that forms between 3 and 6 years and closes by 12 years of age.

Discussion

- Management must be tailored to the patient's age, neurological status, type, and level of injury. Progressive neurological symptoms, significant spine deformation, dynamic instability, and age higher than 8 years are the criteria for surgery.

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