



Incidence of Cervical Spine Injury Among Pediatric Victims of Non-Accidental Trauma.

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Learning Objectives

By the conclusion of this session, participants should be able to:

- State the incidence of cervical spine injury in children with NAT
- Understand the risks and benefits of cervical spine imaging in pediatric NAT.

Introduction

Incidence of cervical spine injury in cases of childhood non-accidental trauma (NAT) is unknown. To help guide the evaluation of children suspected of NAT, we examined our database to determine the incidence of cervical spine injury in these patients.

Methods

- Single-center study
- IRB approved retrospective chart review
- Patients 0-4 years of age
- Suspected cases of NAT between 1/1/1999 and 6/1/2010

Demographics

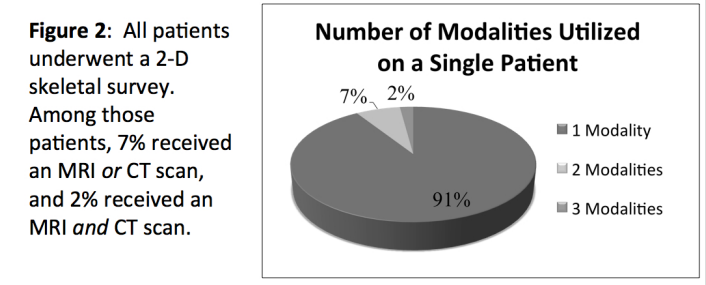
N = 144	
Mean Age	8.6 months (0-42.5 months)
Gender	93 (65%) males

* Race distribution was consistent with catchment area.

Results

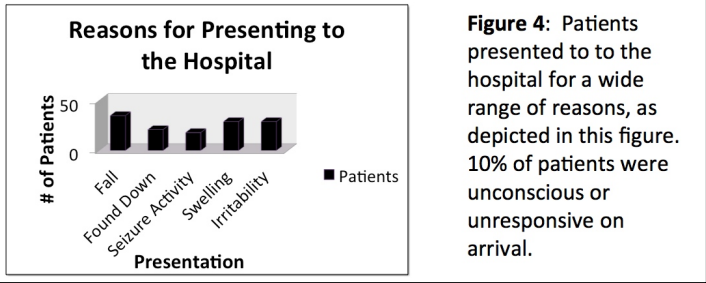
Imaging Modality	Number of Patients (n = 144)
2-D Skeletal Survey	144
CT Scan	9
MR Image	7

Figure 1: Three different imaging modalities were utilized to assess for cervical spine injury.



Injury Sustained	Number of Patients (n= 144)
Cervical Spine Injury	0
Skull Fracture	35
Intra-axial Hemorrhage	11
Extra-axial Hemorrhage	71

Figure 3: Both clinically and radiologically, none of these children were found to have cervical spine injuries. This remained true over a mean follow-up period of 17 months (range of 0-105 months).



Conclusion

Out of a large hospital database, no victims of NAT were found to have cervical spine injuries. These findings were consistent with prior studies that found cervical spine injuries in cases of pediatric trauma to be rare.Children appear to demonstrate resistance to spinal injuries, possibly due to the hypermobility and osseous immaturity of the vertebral bodies that are characteristic of this age group.

The low incidence of cervical spine injury in pediatric NAT patients suggests that the benefits may not outweigh the risks associated with 1) the radiation exposure, which has been found to be greatest with radiographs of the spine and 2) the general anesthesia required to immobilize young patients for adequate imaging.

Clinicians may consider the need for cervical spine imaging on a case-by-case basis.

References

Hadley M N, Zabramski J M, Browner C M, Rekate H, Sonntag K H. Pediatric spinal trauma: review of 122 cases of spinal cord and vertebral column injuries. J Neurosurg 1988; 68: 18–24.

Dickman C, A, Rekate H, L, Sonntag V, K, H, Zabramski J, M, Pediatric Spinal Trauma: Vertebral Column and Spinal Cord Injuries in Children. Pediatr Neurosurg 1989;15:237-256

Katz JS, Oluigbo CO, Wilkinson CC, et al. Prevalence of cervical spine injury in infants with head trauma. J Neurosurg Pediatr 2010; 5(5): 470-73.

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