

Introduction

The revelation of normative radiographic measurements for the developing pediatric spine is incomplete. The purpose of this analysis is to determine the normal range of asymmetry of the lateral atlantodental interval (LADI), and define age- and gender-related differences.

Methods

A total of 3,072 children age 0–18 years who underwent computed tomography (CT) of the cervical spine were identified at Riley Hospital for Children between 2005 and 2017. Patients were stratified by gender and age (in years) into 36 cohorts. Following this stratification, patients within each group were randomly selected for inclusion until 15 patients in each group had been measured (quota sampling). A total of 540 patients were included for study. Right and left linear measurements were performed on the CT axial plane at the C1 mid-lateral mass level.

Results

The overall mean difference between the right and left LADI was 0.09 ± 1.23 mm (range, -6.05 – 4.87 mm). The magnitude of this asymmetry remained statistically insignificant across age groups ($p = 0.278$) and gender ($p = 0.889$). The intraclass correlation coefficient (ICC) was 0.805, 95% CI [0.779, 0.829].

Conclusions

Asymmetry of the LADI is not unusual in asymptomatic children. There is no appreciable difference in magnitude of this asymmetry across age ranges and gender. Measurement of LADI asymmetry shows “good” reliability and is easy to perform. Pediatric neurosurgeons, emergency room physicians, and radiologists should be aware of normative values of asymmetry when interpreting CT scans of the cervical spine. This may prevent unnecessary further workup with dynamic CT or MRI.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) understand the lateral atlantodental interval (LADI) measurement and its clinical relevance, 2) understand how the LADI changes across pediatric age ranges and sex, and 3) be able to use the information learned from our presentation to help screen which patients may or may not need MRI of the

Figure 1

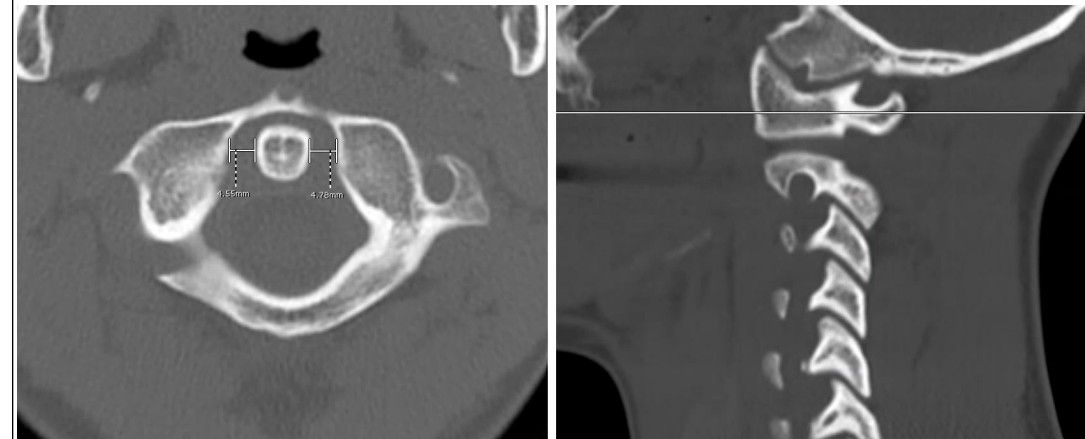


Figure 1. Axial CT section (left) at the craniocervical junction that shows LADI measurements at the C1 mid-lateral mass level confirmed on sagittal CT section (right).