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Improving the care of pediatric trauma patients by reducing radiation exposure during cervical spine radiography: A better technique, cephalic stabilization

Robert E Cilley

Penn State University, USA

Plain radiographs continue to play a role in cervical spine clearance. Inadequate radiographs commonly necessitate repeat x-rays or computed tomography imaging (10 × radiation dose). We have used the technique of cephalic stabilization (CS) to improve the results of plain radiographs. Cephalic stabilization lateral radiographs are obtained, with one assistant applying traction to the arms while another placing fingers in the patient's ears and stabilizing the head. This study tests the hypothesis that CS improves visualization of the cervicothoracic junction during lateral cervical spine radiographs.

A 2-year review of institutional pediatric trauma registry identified 46 patients with CS, matched 1:3 with controls. Randomized lateral radiographs were evaluated independently by 2 pediatric radiologists to determine adequate visualization of the craniocervical and cervicothoracic junctions. Reviewers were blinded to CS through image cropping.

The proportion of adequate visualization of the cervicothoracic junction was 0.85 for cases with stabilization and 0.60 for controls. Odds of obtaining adequate visualization with stabilization are 3.8 times those without stabilization ($P = .001$) and were even greater for patients younger than 13 years.

Cephalic stabilization improves visualization of the cervicothoracic junction in lateral cervical spine radiographs and can reduce radiation exposure in patients who would otherwise require further imaging.

Biography

Robert E. Cilley, MD completed General and Pediatric Surgery training at the University of Michigan. He is currently Professor of Surgery and Pediatrics and Ballantine Professor of Surgery at Penn State College of Medicine, Hershey, PA, USA. He is the Chief, Division of Pediatric Surgery and Surgeon-in-Chief at Penn State Children's Hospital, Milton S. Hershey Medical Center. He was previously the medical director of the Pediatric Trauma Program. He has published over 80 peer-reviewed articles and more than 30 book chapters. His areas of scholarly and professional interest include pediatric trauma, ECMO, lung development, surgical quality and safety.

rcilley@hmc.psu.edu

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