Transverse Process Fracture

see Cervical transverse process fracture.

Isolated transverse process fracture and spinous process fractures (TPFx and SPFx) in the thoracic and/or lumbar region have been deemed clinically insignificant in the adult population. This same rule is often applied to the pediatric population.

Case series

2017

The Ronald Reagan UCLA Medical Center patient database was queried (years 2005-2016) using International Classification of Diseases, Ninth Revision, code 805: fracture of the vertebral column without mention of spinal cord injury.

A total of 129 patients with ITPFs were identified. Mean age was 38.1 years (range 15-92 years). Women were more likely to present with abdominal pain and associated kidney injury (P = 0.018 and P = 0.012, respectively). Motor vehicle accident (MVA) was the most common mechanism of injury (n = 81, 62.8%) and was associated with thoracic (P = 0.032) and lower extremity pain/injury (P = 0.005). Back pain was the most common presenting symptom (n = 71, 64.6%) and was associated with intraabdominal and lower extremity injuries (P = 0.032 and P = 0.016, respectively). Chest and neck pain were associated with vascular injuries (P < 0.001 and P = 0.001, respectively). Spine consult (neurosurgery or orthopedic surgery) was frequent (n = 94, 72.9%) and was more common after MVA versus fall (P = 0.018).

Several factors were identified as significant markers of associated injuries, including female sex, MVA, and presenting symptoms. Neck and chest pain were significantly associated with vascular injuries. Clinicians should maintain high indices of suspicion for associated injuries in patients with ITPFs, especially after high-velocity mechanisms [1].

2016

A study describe the clinical, radiographic, and long-term data on isolated TPFx and SPFx in an exclusively pediatric population.

A retrospective chart review at Monroe Carell Jr. Children's Hospital at Vanderbilt University Hospital Nashville, Tennessee identified 82 pediatric patients with isolated TPFx and/or SPFx following a traumatic event between January 2000 and December 2013. Patient demographic information, presenting symptoms, radiographic characteristics, and follow-up data were collected. Follow-up was used to determine the outcome (presence of neurological deficits) of such injuries via complete physical examination and, when available, radiographic evidence.

In the 82 identified patients, the mean age was 15.5 ± 3.1 years (mean is expressed ± SD throughout), with 72 injuries (87.8%) resulting from a motor vehicle, motorcycle, or all-terrain vehicle accident. There was a mean of 1.7 ± 1.0 fractured vertebral levels involved and a mean of 1.8 ± 1.1

fractures was identified per patient. Seventy-one patients (86.6%) needed bedside pain control, 7 (8.5%) were prescribed a brace, and 4 patients (4.9%) received a collar. Physical therapy was recommended for 12 patients (14.6%). A total of 84.1% had follow-up, and the mean length of follow-up was 19 ± 37 months. No patients had true neurological deficits at presentation or follow-up as a result of their isolated fractures, whereas 95.1% had other associated system injuries.

These data shows that there is no appreciable long-term complication associated with isolated thoracic and/or lumbar TPFx and/or SPFx in an exclusively pediatric population. Because these fractures are, however, associated with high-energy blunt trauma, they often result in associated soft-tissue or other skeletal injury. All pediatric patients in the cohort benefited from conservative management and aggressive treatment of their comorbidities [2)].

1)
Bui TT, Nagasawa DT, Lagman C, Jacky Chen CH, Chung LK, Voth BL, Beckett JS, Tucker AM, Niu T, Gaonkar B, Yang I, Macyszyn L. Isolated Transverse Process Fractures and Markers of Associated Injuries: The Experience at University of California, Los Angeles. World Neurosurg. 2017 Aug;104:82-88. doi: 10.1016/j.wneu.2017.04.137. Epub 2017 Apr 28. PubMed PMID: 28461275.
2)
Akinpelu BJ, Zuckerman SL, Gannon SR, Westrick A, Shannon C, Naftel RP. Pediatric isolated thoracic and/or lumbar transverse and spinous process fractures. J Neurosurg Pediatr. 2016 Jun;17(6):639-44. doi: 10.3171/2015.10.PEDS15377. Epub 2016 Feb 19. PubMed PMID: 26894517.