

Spine and Spinal Cord Injuries After Falls from Tree Stands During Wisconsin Deer Hunting Season

Kimberly Michelle Hamilton MD; Kyle Swanson MD; Brandon George Rocque MD, MS; Nathaniel P. Brooks MD

University of Wisconsin Hospitals and Clinics



Introduction

Deer hunting is popular in much of the United States. In Wisconsin, use of hunting tree-stands is common. Spine surgeons at a Level 1 Trauma Center observed a high incidence of spine and spinal cord injury due to falls from tree-stands while hunting. This study's purpose is to systematically characterize and classify those injuries.

Methods

Our trauma center began classifying tree-stand falls as a unique cause of trauma in 1999. We reviewed the University of Wisconsin Hospital and Clinics' trauma database for tree-stand-related injuries from 1999 to 2013. We collected data pertaining to hunters' demographics, comorbidities, type and mechanism of injury, injury severity scores and Glasgow outcome scores.

Results

We identified 117 patients evaluated after a tree-stand fall. Of these, 65 patients (ages 16-76) experienced 108 fractures, which occurred at all levels from occipital condyle to sacrum. Fractures occurred in the following locations: craniocervical junction, 8 fractures (9%); cervical spine, 7 fractures (7%); cervical thoracic junction, 6 fractures (6%); thoracic spine, 30 fractures (33%); thoracolumbar junction, 31 fractures (34%); lumbar spine, 10 fractures (11%). Compression fractures of the thoracic and thoracolumbar spines were most common with 33% of the fractures documented. Burst fractures were the next most common, with 19 (21%) documented fractures.

Treatment of Spine Fractures and Neurologic Outcomes status post Fall from Tree Stand

Total patients	117	
Patients with spine fractures	65	100%
Operative spine fractures	25	38%
Nonoperative spine fractures	32	55%
Delayed surgery for ineffective bracing	3	4%
Patients with neurologic dysfunction	19	29%
Complete SCI	5	7%
Incomplete SCI	5	7%
Radiculopathy	7	11%
Central cord syndrome	2	3%

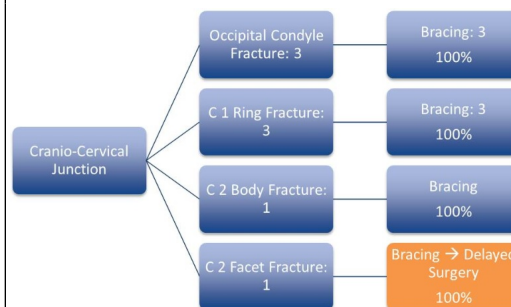
Twenty-five of the 65 patients (38%) required surgical fixation. Nineteen patients (29%) experienced loss of neurologic function: 5 complete spinal cord injuries (26%), 5 incomplete SCI (26%), 2 central cord syndromes (10%) and 7 radiculopathies (38%).

Of the 19 patients with neurologic deficit, 14 (73%) underwent surgical fixation. Two (10%) were treated with a brace; two patients were initially braced but subsequently required surgery. Overall, patients with spine fractures fared well after their fall (mean GOS score: 4.64), however patients with neurologic compromise suffered greater morbidity, with a mean GOS score of 3.89. Fatal events were documented for 1 patient with a T7 fracture-dislocation and complete SCI.

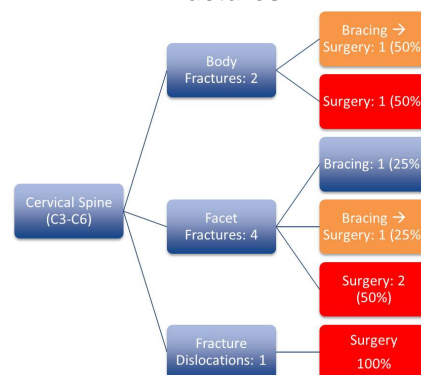
Conclusions

Falls from hunting tree-stands represent a significant cause of spine and spinal cord injury in Wisconsin. These injuries are treated with surgical and non-surgical treatment that is dependent on fracture type and location. Outcomes from surgical and non-surgical treatment at our Level-1 trauma institution are good.

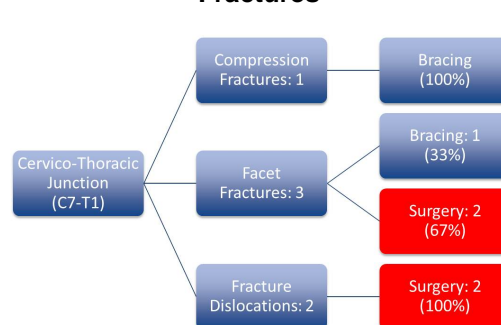
Treatment of Cranio-Cervical Junction Fractures



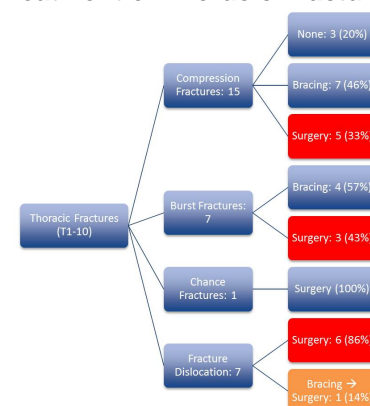
Treatment of Subaxial Cervical Spine Fractures



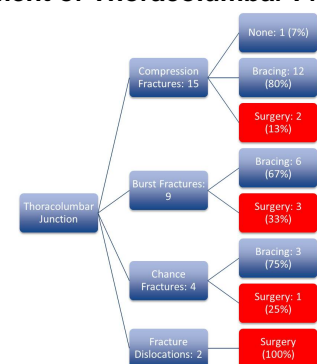
Treatment of Cervico-Thoracic Junction Fractures



Treatment of Thoracic Fractures



Treatment of Thoracolumbar Fractures



Treatment of Lumbar Fractures

