Cervical Spine Evaluation in Obtunded Trauma Patients: When to Omit the CS-MRI.

Ahmad Othman, M.D.; Komola Asimova, Christopher Dodoo, M.S.; Jayanta Gupta, M.D.; Joshua P Herzog, M.D.; Alan H. Tyr- roch, M.D.

INTRODUCTION
Cervical Spine (CS) clearance in trauma patients has been well studied but controversy still exists regarding its evaluation in obtunded trauma patients. We hypothesize that a 64-slice CT of the cervical spine in the appropriate clinical setting is adequate to clear the cervical collar in the obtunded trauma patients.

METHODS AND PROCEDURES
We used the trauma registry at our level one trauma center to identify obtunded trauma patients (GCS 3-14) that underwent both 64-slice CS-CT and CS-MRI between January 2011 and March 2015. We compared results of CS-CT & CS-MRI and assessed all variables that would affect CS-CT adequacy in clearing the cervical spine.

Continuous variables were described using mean and standard deviation. Categorical variables were described using frequencies and proportions. McNemar test was used to assess concordance between CT and MRI results. Spearman’s correlation coefficient was used to assess the association between time of MRI scan and GCS at time of MRI. P values less than 0.05 were considered statistically significant. All analyses were performed using SAS V9.3.

RESULTS
113 patients were included in the final analysis. 81 patients (72%) were male. The mean age was 48. The mean timing for CS-MRI was hospital day 3. Mean GCSat the time CS-MRI was obtained was 9.

29 patients (26%) had false negative CS-CT. The CS-MRI changed the management in 2 (1.7%) of these patients. The most common missed injury was soft tissue injury in 15 patients (42%). Other injuries that were missed included ligamentous injuries in 10 patients (28%) and intra-spinal hemorrhage (SDH/EPH) in 4 patients (11%)

CS-CT quality was inadequate in 3 patients (2.6%) but the results were concordant with CS-MRI in identifying an injury.

5 patients (4.4%) required extended C-Collar placement. 4 patients (3.5%) had discordant results between their 64-slice CS-CT and CS-MRI. 1 patient (0.9%) had a normal CS-CT but required extended C-collars placement due to severe ligamentous injury identified on CS-MRI.

10 patients (9%) required surgical intervention of the cervical spine. 9 patients (8%) had discordant results between their 64- slice CS-CT and CS-MRI. 1 patient (0.9%) had a normal CS-CT but required surgical intervention due to spinal cord edema identified on CS-MRI.

<table>
<thead>
<tr>
<th>MRI Result</th>
<th>CTResult</th>
<th>Negative</th>
<th>Positive</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>49 (96.08)</td>
<td>29 (46.77)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2 (3.92)</td>
<td>33 (53.23)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION
64-slice CT of the cervical spine is not adequate to clear the cervical collar in the obtunded trauma patients. Although eliminating the CS-MRI would result in large cost savings and earlier cervical spine clearance, further studies are needed to define when the CS-MRI can be omitted.

Pediatric Snakebites: Experience from a South-Western-Texas Trauma Center

Samara Lewis, Pranit Chotai, MD, Thomas Pyo, Amr Abdelgawad, MD

INTRODUCTION
Snakebites are responsible for considerable morbidity and mortality, with an estimated average of 421,000 envenomation and 20,000 deaths per year, worldwide.1 In the United States (US) however, snakebites remain only a minor problem, averaging 9000 reported cases of bites and approximately 5 deaths per year.2 Pit vipers, from the crotalidae family, are responsible for most of the snakebites in the US. 80% of crotalidae bites result in enveno-
3rd Annual Clinical Simulation Conference of West Texas:
Bridging Education and Practice Gaps to Improve Patient Outcomes
(Continued)

Pediatric snakebites are rare, but when encountered they may result in massive tissue edema, sepsis, necrosis of tissue with resultant fasciitis or amputation, and in some cases even death. Compared to adults, snakebites in children need special attention because the low total dilution volume results in a relatively larger dose of venom. The severity of the injury usually depends on the size of the snake, the site of injury, the size of the patient, the patient’s susceptibility to venom, and the depth of the bite, especially when fascia has been penetrated. The aim of this study is to assess the prevalence of pediatric snakebites including the management experience and outcomes at a Level I trauma center in Southwestern Texas.

METHODOLOGY
After obtaining Institutional review board (IRB) approval, hospital charts of all pediatric snakebite patients treated at our Level I trauma center between January 1, 2006 and December 31, 2013 were retrospectively reviewed. All patients under 18 years of age with a known diagnosis of snakebite were included. Patients 18 years or older and those with animal bites other than snakebite were excluded.

RESULTS
Twelve male and eight female patients (n=20) with a mean age of 7.5 years (range, 1-17 years) met the inclusion criteria. Of these 20 patients, eight (40%) were bitten on the hand, whereas 12 (60%) bites were on the lower extremity. The species of the snake was known in 18 (90%) cases, and rattlesnake bite was the most frequent (65%). More than half of the patients (>50%) arrived within 2 hours of the snakebite. Twelve (60%) patients received antivenin; 11 patients received Crotalidae polyvalent immune fab (Crotalidae polyvalent immune fab) (Fab), (Anavip®), InstitutoBiocon, S.A. de C.V., Mexico). Analgesics and antibiotics were administered at the discretion of the treating physician. Six patients (30%) received antibiotics, 5 (25%) received an opiate for pain relief and 5 (25%) were given acetaminophen. Out of the 20 cases, 11 (55%) patients stayed in the hospital for more than one day. Twelve of the twenty patients were admitted to the hospital, of which 10 were admitted to the intensive care unit (ICU). Except for one patient who was delayed and under dosed with antivenin, all patients were discharged within 4 days of admission and did not require any surgical intervention. There were no mortalities. All incidents occurred in the spring, summer or fall, with no cases occurring during the winter months.

SUMMARY/DISCUSSION
Our data was consistent with that of other studies, in that most bites occurred during the warmer seasons and all of them involved

Continued on page 15
the upper and lower extremities. Our data correlates with the current understanding of treatment, in that all envenomation that had been treated with antivenin resolved fairly quickly, and the one patient that had complications did in fact, receive an inadequate dose of antivenin six hours after the bite, which is significantly longer than what is recommended.

REFERENCES


