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Vincent Eusterman

Denver Health Medical Center, USA

Carotid artery injury in temporal bone fractures

Background & Aim: Temporal bone fractures are commonly evaluated by the otolaryngologist and often extend to numerous cranial structures including the carotid canal. Fracture of the carotid canal can cause carotid injury, hemorrhage, stroke and death. The purpose of this study is to examine the incidence of carotid artery injury in patients who sustain temporal bone fractures to determine the need for carotid injury evaluation.

Methods: We evaluated three databases of clinical, financial and radiographic data from trauma patients treated at our level one trauma center over a 9 year period that met specific criteria for skull base fractures and carotid artery injury. We combined the results from these databases, purging duplicates and cross-referenced our radiology archive and identified 1380 patients with valid radiographic data identifying skull base fractures. The temporal bone radiographs and carotid artery injuries of these patients were then reviewed by two neuro radiologists for accuracy.

Results: Of 1380 skull base fractures, 552 (40%) involved the temporal bone, and 51 (3.69%) involved the carotid artery injury. 34 (2.5%) were neck (C1) injuries, 2 (0.1%) combined C1 and C2-7 injuries, and 15 (1.1%) temporal bone (C2-C7) injuries. When compiling the data 12 patients (2.17%) had both carotid artery and temporal bone fracture.

Discussion: The greatest incidence of carotid artery injury in skull base fractures occurred at the C1 segment from stretch and deformity injury. Temporal bone fractures (C2-C7 segments) had a 2% incidence of carotid injury.

Conclusions: This review of 1380 skull base fractures demonstrated 552 (40%) temporal bone fractures of which 12 (2.17%) patients had associated carotid artery injuries. Otolaryngologists should remain aware of the risk of carotid artery injury with temporal bone fractures and in skull base fractures. The routine use of routine angiography (CTA or 4-vessel angiogram) is probably not necessary in cases of isolated temporal bone fracture.

Biography

Vincent Eusterman is Director of Otolaryngology-Head and Neck Surgery at Denver Health Medical Center and Associate Professor of Surgery in the Department of Otolaryngology-Head and Neck Surgery, University of Colorado School of Medicine. He has an extensive background in head and neck trauma, oncologic surgery, and skull base surgery. He is Director of the level one trauma hospital division of otolaryngology-head and neck and trauma surgery.

vincent.eusterman@dhha.org

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