Traumatic vertebral artery injury

Traumatic vertebral artery injury (TVAI) presents a clinical challenge since it is hard to detect, has a diverse presentation and there are no widely accepted guidelines on diagnosis and management. Most evidence available on TVAI is class 3, based on case series from individual institutions. Spontaneous vertebral artery dissection is well described and typically managed by anticoagulation [1].

TVAI may occur following blunt or penetrating trauma.

see also Blunt traumatic vertebral artery injury.

see also Iatrogenic vertebral artery injury.

Case series

729 patients with Cervical Spine Trauma (CST) were retrospectively analyzed, including rates of VAI, age at injury, cause of injury, cardiovascular history, smoking history, substance abuse history, embolization therapy, and antiplatelet or anticoagulant therapy prior or after injury. VAIs were identified and graded following the Modified Denver Criteria for Blunt Cerebrovascular Injury utilizing Magnetic Resonance Angiography and Computed Tomography Angiography (CTA). Brain scans were reviewed for stroke rates and statistically significant variations.

33 patients suffered penetrating trauma while 696 patients experienced blunt trauma. 81 patients met the criteria for analysis with confirmed VAI. VAI was more common in penetrating injury group compared to blunt injury group (64% vs 9%, $P < 0.0005$). However, low-grade VAI (<grade III) was more common in blunt injury group versus penetrating group (37% vs 14%, $P < 0.05$). The frequency of posterior circulation strokes did not vary significantly between groups (26.3% versus 13.8%, $P = 0.21$). Cardiovascular comorbidities were significantly more common in the blunt group (50%, $P = 0.0001$) compared to penetrating group (0%).

VAI occurs with a high incidence in penetrating CST. Although stroke risk following penetrating and blunt CST did not vary significantly, they resulted in serious complications in a group of patients. Further studying of this patient population is required to provide high-level evidence-based preventions for VAI complications [2].

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Kim YK, Schulman S. Cervical artery dissection: pathology, epidemiology and management. Thromb Res. 2009 Apr;123(6):810-21. doi: 10.1016/j.thromres.2009.01.013. Epub 2009 Mar 9. Review. PubMed PMID: 19269682.
2)
AlBayar A, Sullivan PZ, Blue R, Leonard J, Kung D, Ozturk AK, Chen HI, Schuster J. Risk Of Vertebral Artery Injury And Stroke Following Blunt and Penetrating Cervical Spine Trauma: A Retrospective Review Of 729 Patients. World Neurosurg. 2019 Jul 3. pii: S1878-8750(19)31844-3. doi: 10.1016/j.wneu.2019.06.187. [Epub ahead of print] PubMed PMID: 31279109.