Traumatically induced vertebral artery occlusion associated with cervical spine injuries: prospective study using magnetic resonance angiography.

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STUDY DESIGN: A prospective study using magnetic resonance angiography (MRA) on a consecutive cohort of patients with cervical spine injuries. OBJECTIVE: To investigate clinical and radiographic features of vertebral artery injury/occlusion associated with nonpenetrating cervical spine trauma. SUMMARY OF BACKGROUND DATA: With the popularization of MRA, vertebral artery injury has been a common complication of cervical spine trauma. However, detailed clinical features such as restoration of blood flow in occluded vessels and collateral circulation have not been fully evaluated. METHODS: During a 2-year period, 64 consecutive patients with cervical spine fractures and/or dislocations were prospectively evaluated for patency of the vertebral artery and collateral circulation. Extracranial and intracranial MRAs were conducted at initial injury and follow-up. RESULTS: Vertebral artery occlusion occurred in 11 patients, including 10 with unilateral and 1 with bilateral. Only the patient with bilateral occlusion was symptomatic but had no permanent neurologic deficit as a result of brain ischemia. He had complete circle of Willis, which provides sufficient collateral blood supply from anterior circulation. Follow-up MRAs revealed restoration of blood flow in occluded vessel(s) in 3 patients. All of them had compressive injuries. CONCLUSIONS: The incidence of traumatically induced vertebral artery occlusion was 17.2%. The potential for blood flow restoration was higher in compressive injuries than in distractive injuries. The mechanism of occlusion in compressive injuries is likely to be vasospasm or minor artery dissection, which may cause reversible occlusion because vessels are subjected to relatively minor stretching in compressive injuries. Vertebral artery occlusion was rarely symptomatic because of sufficient collateral blood supply through not only contralateral vertebral artery but also the circle of Willis.

PMID: 16135985 [PubMed - indexed for MEDLINE]

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