optimising therapeutical strategies.

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Success and limitations of investigations in cervical artery dissections

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Background and purpose: The accuracy of investigations in diagnosis of cervical artery dissections (CAD) has not yet prospectively determined. Our objectives were to study and compare 3 investigations in CAD diagnosis: cervical magnetic resonance imaging (MRI), Duplex Doppler ultrasound (DDU) and intra-arterial digital subtraction angiography (DSA).
Methods: From 1994 to 2005, 115 patients were considered for inclusion in a protocol on CAD and 109 were prospectively included. The criteria for CAD inclusion were an intramural hematoma demonstrated by cervical MRI (fat suppressed T1 sequencies) or signs suggesting CAD on at least 2 vascular investigations. The morphological aspects of a dissecting hematoma, which were independently analysed by 2 radiologists and 2 neurologists, were the following: 1) by MRI, the presence of an intramural hematoma; 2) by DDU, including study of ophthalmic arteries and transcranial Doppler sonography, the presence beyond the carotid bulb or in V2 of an eccentric narrowing channel, or a segmental ectasis, or a visible tapering occlusion; 3) by DSA, a proximal tapering occlusion or stenosis, or a string sign, or a double channel or an aneurismal ectasis.
Results and Discussion: One hundred and nine patients with CAD (49 women and 60 men, mean age at the time of the first CAD: 44 ± 9.7 years) were included. Twenty two suffered from isolated TIA and showed internal carotid artery (ICA) (n = 16) and/or vertebral (VA) (n = 6) dissection. Sixty four suffered from ischemic stroke due to a VA (n = 21) or ICA (n = 43)dissection. Ninety nine had only local signs (Horner syndrome (n = 12), cranial nerve palsy (n = 2), neck pain (n = 2) and headache (n = 3). Two patients were admitted for a subarachnoid hemorrhage. Cervical MRI shows an intramural hematoma in 60% of the investigated patients (35/58) with the same proportion in VB and Carotid dissections. Negative data were due to artifacts, too early investigations before the 72 first hours after the onset of CAD or intracranial vertebral arteries. MRI was positive in eight patients whose DDU was normal.
DDU identifies at least one aspect suggesting a dissecting hematoma in 26% of the investigated patients (28/108). Seventeen patients had an eccentric residual channel, combined with an ectasis in 6 and 11 had a visible tapering occlusion. Pathological indirect hemodynamic signs were present in 41 patients and 12 intracranial VA stenosis or occlusion were detected. Normal DDU (9.26% of the patients) was due to moderate segmental carotid dissections or intra-cranial vertebral artery dissections. When the positive data of these 2 non invasive investigations were combined, CAD were recognised in 52 % of the patients. DSA remains mandatory when the clinical signs are suggestive of CAD or if the non invasive investigations are negative or discordant.
Conclusion: DDU and MRI should be performed as early as possible. MRI remains the gold standard to demonstrate the intramural hematoma but needs to be preceded by a DDU which helps to better orientate it and is abnormal in 90% of the patients.
DSA still has a great importance in vertebral artery dissections and if there is a radiological doubt.

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Transcranial color-coded sonography for the detection and follow up of space-occupying hemorragic strokes

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Objective: The purpose of this study was to validate the accuracy and reliability of transcranial color-coded sonography (TCCS) in detecting and follow up of hemorrhagic strokes (HS) in critically ill patients.TCCS allows non-invasive detection of space occupying strokes such as intracranial hemorrhage.HS represents 10-15% of total strokes.TCCS was carried out every 8 hours at patients bedside. Patients performed. Cerebral CT scan at admission.Informations about HS size were obtained through bilateral transtemporal and suboccipital acoustic bone windows with the use of 2 Mhz sector scan (Philips: EN VISOR C). Imagines about parenchymal structures and intracranial vessels were drawn. HS appeared hyperechogenic on the B-Mode TCCS scan (see Fig. 1. TCCS: right transtemporal acoustic window. Large left hyperechogenic area due to HS.) Hemorragic area size was measured. Its volume was 44.2 cm2 the day 1. This value correlated with CT scan data. Anti-edemigen therapy was started. TCCS scans performed 8 and 16 hours after patient admission showed small, non significant reduction of hemorrhagic area. The day 2, transcranial assessment of the lesion showed a significant reduction of its volume and echogenicity (19.8 cm2, see Fig. 2. TCCS Scan: reduction of hemorragic area volume.)
Conclusions: TCCS is a reliable, non-invasive tool, for the detection and follow up of cerebral space-occupying lesions. Furthermore, transcranial imaging is suitable in critically ill often artificially ventilated patients.