

A RETROSPECTIVE REVIEW OF 38 PATIENTS WITH ANGIOGRAPHIC-NEGATIVE SPONTANEOUS SUBARACHNOID HAEMORRHAGE – CLINICAL COURSE AND DIAGNOSTIC YIELD OF FOLLOW-UP RADIOLOGICAL WORKUP

NL Chan, KN Hung

Queen Mary Hospital

BACKGROUND: Spontaneous subarachnoid haemorrhage (SAH) is a commonly seen neurosurgical problem in which the most common etiology is a ruptured intracranial aneurysm. In our center, initial investigations usually include CT angiography (CTA) followed by digital subtraction angiography (DSA). Patients with negative initial CTA and DSA, however, are not uncommon. Yet there is no well-established guideline or protocol for additional diagnostic workup.

METHOD: This is a retrospective study to assess patients with angiogram-negative SAH. Between 2001 and 2015, 38 patients were diagnosed to have spontaneous SAH with negative initial findings on CTA and DSA. They are divided into peri-mesencephalic group (PM) and non peri-mesencephalic group (NPM) based on blood distribution on the initial plain CT brain. Severity (in WFNS grading) and complications rate and need of CSF diversion were compared between 2 groups. The subsequent diagnostic workup and diagnostic yield are then evaluated.

RESULT: Patients in NPM group are more likely to have high WFNS, vasospasm, rebleeding, and hydrocephalus requiring CSF diversion (e.g. EVD, lumbar drain and VP shunt). 2 of 38 patients defaulted follow-up. No subsequent diagnostic workup was arranged in 3 patients. The remaining 33 patients had received subsequent cerebral vascular workup. The most commonly used modality in subsequent diagnostic workup was DSA, which is used in 27 of 33 patients. CTA was used in 5 of 36 patients and MRI/MRA was used in 1 patient. No additional patient had vascular source identified. 13 patients received MRI/MRA spine after the first follow-up diagnostic imaging. 1 patient was then diagnosed to have spinal AVM. 3 patients with had 2 negative DSAs and negative MRA/MRI spine received the 3rd DSA. 1 patient was then diagnosed to have an ophthalmic ICA infundibulum. There was a patient with negative initial CTA and DSA, as well as a negative follow-up DSA. He presented with SAH again 7 years after the first SAH and DSA showed posterior fossa AVF. Overall, 3 patients with initial negative DSA and CTA were diagnosed to have bleeding sources and treated accordingly. All 3 patients were from NPM group.

CONCLUSION: 70% of patients presented with SAH with negative initial CTA and DSA are classified as NPM pattern. In this group of patient, they tend to have higher WFNS, higher likelihood of CSF diversion and complication of SAH. Early follow-up DSA/CTA/MRA showed no diagnostic yield in this series. However, MRI/MRA spine and long-term follow-up angiogram do identify vascular source in 6% of these patients which is compatible with previous similar study. Also, negative early follow-up imaging may not be secure enough to rule out vascular origin especially in patients in NPM group. Overall, this supports short-term follow-up diagnostic workup including angiogram and MRI/MRA spine as well as long-term follow-up angiogram in NPM group. In PM group patient, follow-up diagnostic workup yield is minimal. Invasive diagnostic procedure (e.g. DSA) may not offer any benefit.