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Clinical-neurological features and ct angiography findings in patients with ruptured intracranial aneurysms

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Abstract. Ruptured intracranial aneurysms are a major cause of aneurysmal subarachnoid hemorrhage and may lead to severe neurological complications. This study aimed to characterize the clinical-neurological manifestations and computed tomography angiography (CTA) findings in patients with ruptured intracranial aneurysms. A retrospective observational study included 104 patients aged 18–59 years with aneurysmal subarachnoid hemorrhage. Clinical records and available computed tomography and CTA examinations were reviewed. The clinical assessment focused on sudden severe headache, nausea and vomiting, meningeal signs, impaired consciousness, and focal neurological deficits. The radiological assessment included aneurysm location and, where documented, size, morphology, multiplicity, distribution of subarachnoid blood, and associated intracranial complications. The study was designed to describe the clinical presentation and anatomical characteristics of ruptured aneurysms and to provide a basis for examining potential relationships between clinical manifestations and imaging findings. The exact frequencies and percentages of clinical and radiological characteristics require verification using the original patient records. A systematic combination of clinical-neurological assessment and CTA may contribute to the comprehensive characterization of patients with aneurysmal subarachnoid hemorrhage and support diagnostic evaluation and treatment planning.

Keywords: ruptured intracranial aneurysm, aneurysmal subarachnoid hemorrhage, clinical-neurological manifestations, computed tomography angiography, aneurysm location, aneurysm morphology, neuroimaging, intracranial hemorrhage.

Introduction. Rupture of an intracranial aneurysm is a major cause of non-traumatic subarachnoid hemorrhage and represents a neurological emergency requiring rapid diagnostic assessment. The clinical presentation may range from sudden severe headache and meningeal irritation to loss of consciousness and focal neurological deficits. Accurate identification of the ruptured aneurysm is essential for determining the appropriate treatment strategy [1].

Computed tomography angiography (CTA) is an important non-invasive imaging method for detecting intracranial aneurysms and defining their anatomical characteristics. It can provide information about aneurysm location, size, shape, and relationship to adjacent vessels. Evidence from systematic reviews supports the diagnostic value of CTA in patients with suspected aneurysmal subarachnoid hemorrhage, although diagnostic performance may vary with aneurysm size and imaging technique [2, 3].

Aim. To characterize the clinical-neurological manifestations and CTA findings in patients with ruptured intracranial aneurysms.

Materials and Methods. A retrospective observational study included 104 patients aged 18–59 years with aneurysmal subarachnoid hemorrhage. Clinical records and available CT and CTA examinations were reviewed. Clinical parameters included sudden severe headache, nausea and vomiting, meningeal signs, impaired consciousness, and focal neurological deficits. Imaging parameters included aneurysm location and, where documented, size, morphology, and the presence of multiple aneurysms. The distribution of subarachnoid blood and associated radiological complications were also considered when the relevant information was available.

Clinical and imaging variables should be summarized using absolute numbers and percentages. Where patient-level data permit, additional analyses may explore associations between clinical presentation, aneurysm characteristics, and hemorrhage distribution. Such associations should be reported only when supported by the actual statistical analysis.

Results. The study population comprised 104 patients aged 18–59 years. The principal analytical focus was the distribution of presenting neurological manifestations and the anatomical characteristics of ruptured aneurysms identified on CTA. The imaging review was designed to assess aneurysm location, size, morphology, and multiplicity, where recorded. The clinical review focused on headache, meningeal signs, vomiting, altered consciousness, and focal neurological symptoms. Exact frequencies, percentages, and relationships between variables must be established from the original clinical and imaging records before publication.

Discussion. CTA provides valuable anatomical information for the diagnostic evaluation of ruptured intracranial aneurysms and can assist in treatment planning [1, 2]. The description of aneurysm location and morphology alongside the patient's neurological presentation may help characterize the clinical spectrum of aneurysmal subarachnoid hemorrhage. Nevertheless, aneurysm location alone should not be assumed to determine clinical severity or outcome. Such relationships require analysis that accounts for hemorrhage distribution, clinical grade, associated complications, and other relevant factors.

A further consideration is that multiple aneurysms may be present in an individual patient. Therefore, analyses should clearly distinguish the number of patients from the number of aneurysms and should identify the presumed ruptured aneurysm whenever this information is documented. If CTA findings are negative

or inconclusive despite strong suspicion of an aneurysmal source, further vascular investigation may be indicated in accordance with current clinical guidance [1].

Conclusion. The combined assessment of clinical-neurological manifestations and CTA findings is important for the diagnostic characterization of ruptured intracranial aneurysms. Systematic documentation of presenting symptoms and aneurysm anatomy may improve the description of this patient population and provide a basis for further research into clinical and radiological associations.

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