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Case report

Rare coincidence of a giant aneurysm of the basilar artery with a macroadenoma of the pituitary gland in a forensic autopsy

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Dedicated to Prof. Dr. med. Dr. h.c. mult. Otto Prokop on the occasion of his 85th birthday.

Abstract

Based on a recent case, the combined occurrence of a giant aneurysm in the transition zone of vertebral artery and basilar artery with a macroadenoma of the pituitary gland is reported. A 42-year-old man requiring dialysis because of terminal renal insufficiency due to glomerulonephritis and with the previous diagnoses of arterial hypertension and an untreated macroadenoma of the pituitary gland was admitted to hospital for neurological symptoms (hemiparesis, impaired speech and balance, dizziness). The diagnostic measures revealed an unruptured large aneurysm of the vertebral/basilar artery with cerebrospinal fluid block and signs of elevated intracranial pressure (internal obstructive hydrocephalus) as well as a macroadenoma of the pituitary gland. In view of the fact that the intracranial pressure was rising progressively and the aneurysm was categorized as inoperable, a ventriculoperitoneal shunt was placed. After normalization of the intracranial pressure and an uneventful postoperative course, the patient was transferred to a rehabilitation facility where he died unexpectedly 2 weeks later. As the circumstances of his death were unclear, a forensic autopsy was ordered, the results of which are reported and discussed.

Keywords: Giant aneurysm; Vertebral/basilar artery; Pituitary macroadenoma; Sudden death

1. Introduction

1.1. Epidemiology

According to large autopsy studies, the incidence of intracranial aneurysms in the population is 1–2% [1,15] with approximately 95% of the cerebral aneurysms affecting the anterior and middle cerebral arteries and only 5% the posterior cerebral arteries, the basilar artery and the vertebral arteries [18]. As to the sexual distribution, the incidence is somewhat higher in women than in men and the age peak for ruptured aneurysms is in the fifth and sixth decades of life.

1.2. Etiology and pathogenesis

Aneurysms of the intracranial arteries are categorized according to either morphological or etiological aspects into saccular or berry-shaped, arteriosclerotic or fusiform, septic and dissecting aneurysms [2,18,21] with saccular aneurysms being the most frequent type (approximately 90%). Arteriosclerotic aneurysms are ranking second (approximately 7%). The other forms are relatively rare.

A giant aneurysm is defined as an aneurysm with a diameter of 25 mm or more [5,23]. Between the size of the aneurysm and the risk of rupture there is a significant relation [6].

Pathogenetically, the mechanism underlying the formation of saccular aneurysms is not yet fully understood [2]. It is assumed that a congenital weakness of the vascular wall (collagen type III deficiency), media defects and degenerative changes of the vascular wall are involved [15,22]; this theory is supported by the observation that aneurysms are preferably localized at bifurcations. The absence of the external elastic lamina (a characteristic feature of the cerebral arteries [2]) is also deemed to be a contributing factor. In fusiform aneurysms, arteriosclerotic changes are predominant.

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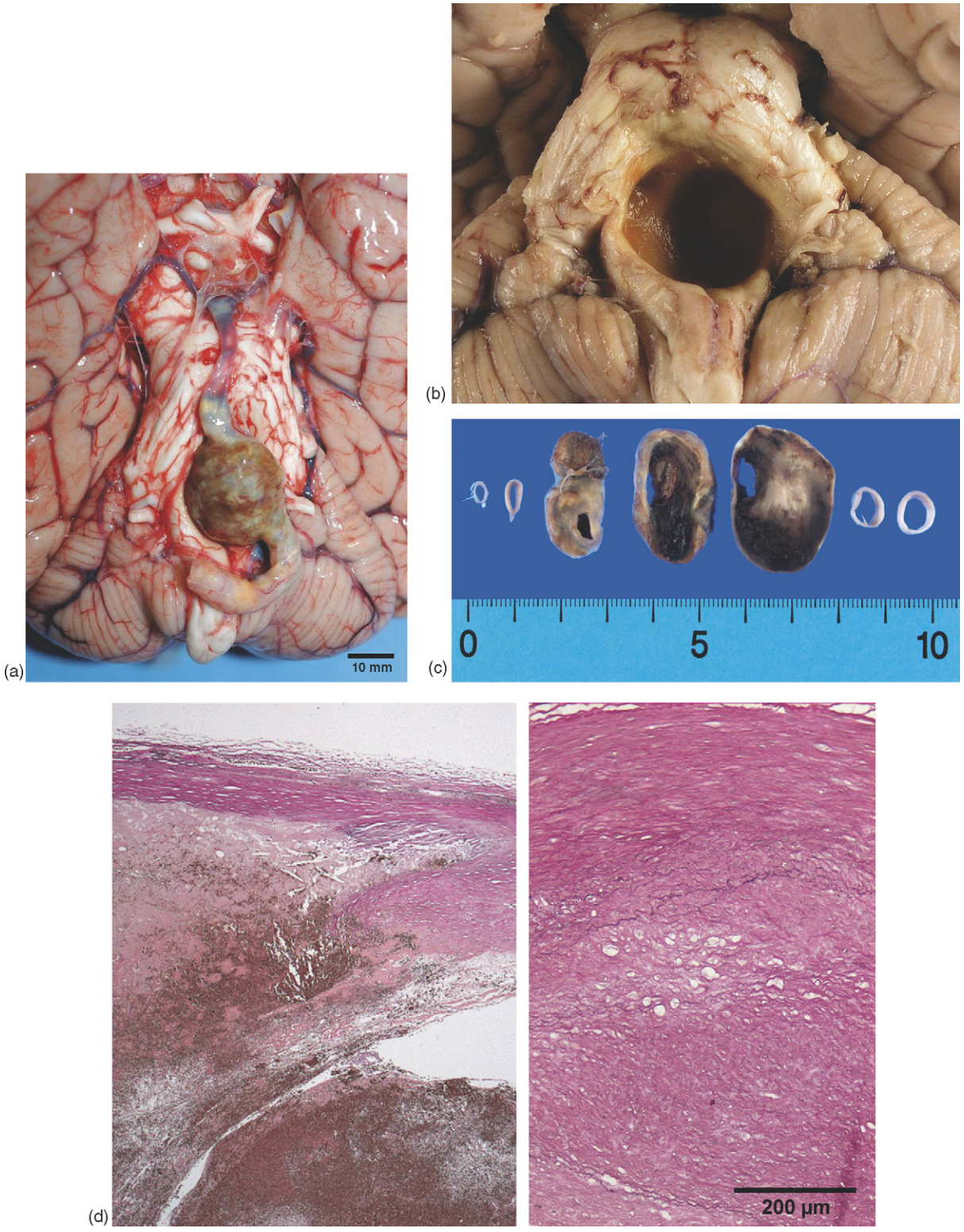

Fig. 1. (a) View of the brain base with a giant aneurysm of the basilar artery/right vertebral artery. (b) After removal of the basal vessels, a crater-like depression corresponding to the size and configuration of the aneurysm is discernible in the pons cerebri and medulla oblongata. (c) Partially thrombosed aneurysm on cross-sections after formalin fixation. (d) Elastica staining of the arterial wall in the region of the aneurysm (overview and close-up view).