

# Intracranial Aneurysm Mimicking Cerebral Cavernous Malformation

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✓ Vascular pathologies of the brain have different clinical, and neuroradiological manifestations which enable the establishment of definitive diagnosis preoperatively. We report a case of intracranial aneurysm presenting with epileptiform manifestations, and unusual magnetic resonance imaging (MRI) findings which preoperatively diagnosed as cerebral cavernous malformation. We have highlighted the possible mechanism of the unusual MRI appearance and differential diagnosis of the lesion.

**Key words:** Intracranial aneurysm, cerebral cavernous malformation, cerebral vascular malformations, intracranial hemorrhage, chronic hematoma, hemosiderin rim

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## Serebral Kavernöz Malformasyona Benzeyen İntrakranyal Anevrizma

✓ Beynin vasküler patolojileri preoperatif tanımı olası kılan farklı klinik yansımaları ve nöroradyolojik görünümlere sahiptir. Bu çalışmada epilepsi ve alsilik olunmayan MRI bulguları olan ve preoperatif olarak serebral kavernöz malformasyon ön tanısı konulmuş bir intrakranyal anevrizma olgusu sunulmaktadır. Ender MRI görüntüsüyle ilgili olası mekanizmalar ve lezyonun ayırıcı tanısı vurgulanmıştır.

**Anahtar kelimeler:** İntrakranyal anevrizma, serebral kavernöz malformasyon, serebral damarsal malformasyonlar, kafa içi kanama, kronik hematom, hemosiderin halka

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Vascular malformations of the brain demonstrate specific MRI images facilitating the preoperative diagnosis. Rarely, MRI findings can give rise to differential diagnostic challenges. In this study we present a case of intracranial aneurysm mimicking cerebral cavernous malformation.

## CASE REPORT

A 32-year-old man presented to our clinic with a

2 year- history of tonic-clonic seizures. His neurological examination was normal. Preoperative cranial MRI showed nonenhancing, heterogeneous signal intensity in superior temporal gyrus and hypointens area around the lesion in T1- and T2-weighted images (Fig. 1A-1B). Leading diagnosis was cerebral cavernous malformation.

The patient underwent a left temporal craniotomy, and his lesion was excised. After exposure of dura, lesion was localized with transcortical ultrasonography. Transcortical route was used to reach the lesion and small arterial feeders of the lesion were cauterized and cut. Hemosiderin accumulation was seen around the lesion intra-

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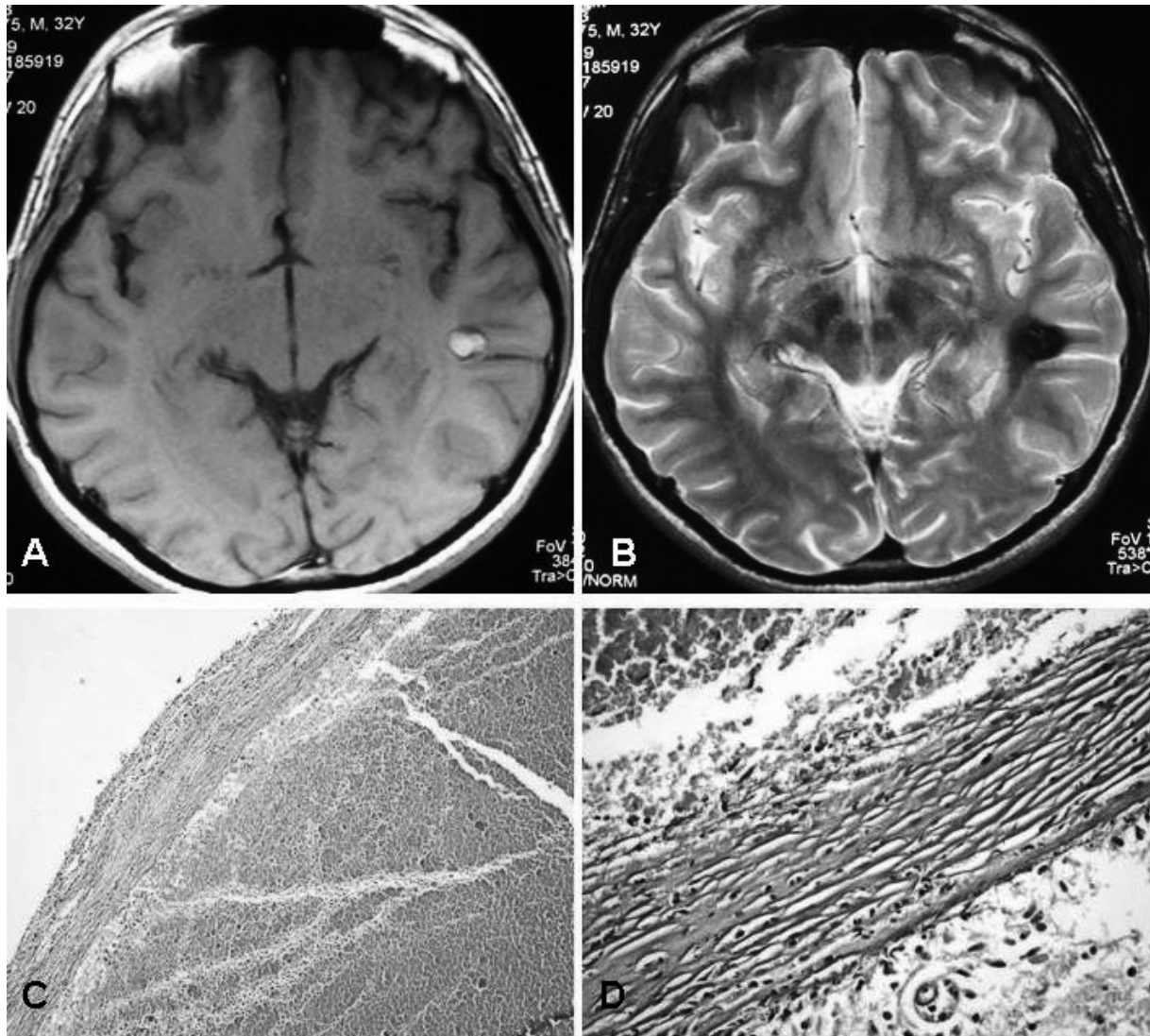


Figure 1. (A) Axial T1-weighted cranial MRI reveals superior and middle temporal gyri located, hyperintense lesion, (B) Axial T2-weighted image reveals punctuate hyperintense areas in lesion and hypointense surrounding rim, (C) Aneurysm wall formed by thickened fibrous tissue without tunica media filled with red blood cells (Hematoxylin-eosin, x40 original magnification), (D) High power field reveals lymphocytic and siderophages in and around wall of aneurysm (Hematoxylin-eosin, x400 original magnification).

operatively as yellowish and firm area. Intraoperative diagnosis was also cerebral cavernous hemangioma. Histopathological evaluation showed a thick monolocular vessel with arteriolized wall with a freshly formed thrombus inside (Fig. 1C-1D). Histopathological diagnosis was saccular aneurysm. The follow-up of the patient was uneventful.

## DISCUSSION

The hypointense area in the brain parenchyma

around the vascular lesion (hemosiderin rim) on T2- weighted MRI produced by hemosiderin, a degradation product of the hemoglobin iron, also causes selective T2 proton relaxation enhancement and represents chronic hemorrhage<sup>(3)</sup>.

Concomitance of hemosiderin rim may be seen in different cerebral pathologies. The most typical MRI description of cerebral cavernous malformation includes a heterogeneous reticulated “popcorn-like” appearance, with a complete

hypointense hemosiderin rim. There may be little or no contrast enhancement <sup>(2)</sup>. Subacute intracerebral hemorrhages initially display a rim of hyperintensity on T1-, or possibly hypointensity on T2 weighted images <sup>(3)</sup>. In our case, lesion showed heterogeneous signal intensity and hypointense rim in the surrounding white matter which resembled to a cerebral cavernous malformation.

Distal middle cerebral artery and thalamo-perforating artery aneurysms generally present to the clinic with subarachnoid haemorrhage which easily suggests the diagnosis of aneurysm as the leading cause demonstrable with preoperative angiography <sup>(1,4-6)</sup>. Current case was presented with an atypically located aneurysm with similar radiological features of cerebral cavernous malformation, and a history of seizure. Possible explanations of why this aneurysm did not cause subarachnoid haemorrhage, and demonstrated radiological images similar to cerebral cavernous malformation can be summarized as <sup>(1)</sup> the location of the aneurysm in the distal or perforating branch of middle cerebral artery enabled hemostatic forces of the surrounding supportive brain parenchyma to be effective on the aneurysm wall <sup>(2)</sup> thrombus formation in the lumen of aneurysm which slows down blood flow (as revealed with heterogeneous signal intensity in MRI) preventing acute devastating high volume haemorrhage.

In clinic, intracranial aneurysms mostly show up with devastating features of subarachnoid or intracerebral haemorrhage. On the other hand epilepsy is one of the major presenting symp-

toms of cerebral cavernous malformation. In our case patient presented with a 2 year- history of epilepsy and in his cranial MRI typical features of cerebral cavernous malformation were seen, and definitive diagnosis of cavernoma was made based on these findings.

This case represents an extremely rare presentation of intracranial aneurysm in terms of clinical and neuroradiological findings and also shows that a preoperative vascular imaging study (e.g. MR- or CT-angio) even in case of suspected cavernous angioma is mandatory to exclude the possibility of a small vascular arteriovenous malformation or an aneurysm. This case is also a good example demonstrating that a definite diagnosis of brain pathology can be established after histopathological evaluation.

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