DURAL ARTERIOVENOUS FISTULA (DAVF): A RARE CAUSE OF HYPOESTESIA – A CASE REPORT AND REVİEW OF THE LİTERATURE

Case Report

DURAL ARTERİYOVENÖZ FİSTÜL: HİPOESTEZİNİN NADİR BİR SEBEBİ-OLGU SUNUMU VE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ

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ABSTRACT

DAVF is a rare acquired entity which can present with a wide spectrum ranging from a mild course to life-threatening conditions. The uncommon risk factor among classifications of DVAF is the presence of cortical venous reflux. Digital subtraction angiography (DSA) is to make a gold standard diagnosis and treatment. In our case , we wanted to contribute to the daily practice by showing the place of this lesion in the popular DAVF classification and the steps towards making a diagnosis in a patient who was admitted to hospital with a facial hypoesthesia

Keywords: Duralarteriovenous malformation,ortical venous reflux,hypoesthesia

ÖZET

Dural arteriyovenöz fistül (DAVF) nadir görülen, edinsel, hafif seyirliden hayatı tehdit edecek kadar tehlikeli klinik tablolar oluşturabilen geniş bir klinik yelpazeye sahiptirler. DAFV ile ilgili çeşitli sınıflamalarda belirtilen ortak tehlike kortikal venöz reflünün varlığıdır. DAFV'nın gerçek insidansı bilinmemekle birlikte seçili çalışmalarda intrakranial AVM'lerin yüzde onunu oluşturduğu tahmin edilmektedir.

Sessiz kliniği ve bazen spontan gerilemesi nedeniyle çoğu zaman literatürde verilen insidans gerçeği yansıtmamaktadır. Tüm yaş gruplarında görülmekle birlikte edinsel olmaları nedeniyle diğer AVM'lere göre daha geç yaşlarda ortaya çıkarlar.Agressif nörolojik semptomların olduğu formları erkeklerde daha sıktır. Etyopatogenezde dural venlerle serebral arterler veya dural arterler arasındaki anormal bağlantıların oluşması sorumlu tutulmaktadır. Serebral dijital substraksiyon anjiografi (DSA) her zaman için tanı ve tedavide altın standarttır. Bu sunumda hastanemiz acil servisine yüzde uyuşma şikayeti ile gelen 48 yaşındaki bayan olgumuzda tanıya gidiş aşamalarını ve lezyonunun güncel popüler DAFV sınıflamasındaki yerini

sunarak günlük pratiğinize katkı da bulunmayı amaçladık.

Anahtar kelimeler: Dural arteriovenöz malformasyon, Kortikal venöz reflü, Hipoestezi

INTRODUCTION

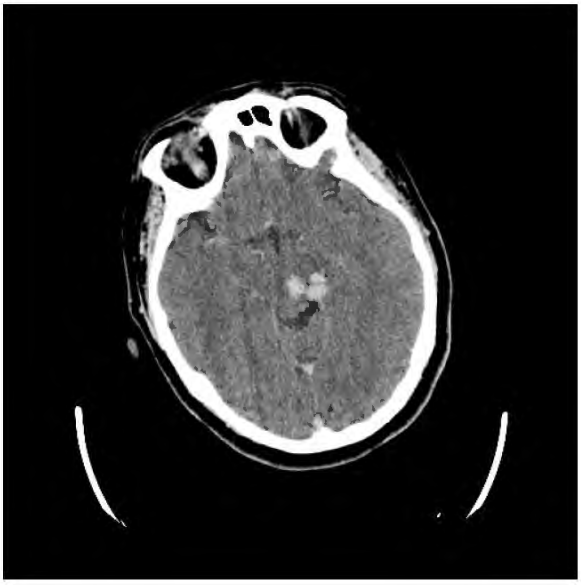
DAVF is a rare lesion and some types can be life-threatening. In this case report we wanted to show the importance of including the diagnosis of DAVF when an intravascular pathology is suspected. We reviewed the modalities used in making a diagnosis of DAVF and their contribution to the treatment plan.

CASE REPORT

A 47 year old woman was admitted to the hospital because of right facial hypoesthesia and tinnitus.

Nonenhanced and enhanced cranial computerized tomography (CT), magnetic resonance imaging (MRI), computerized tomography anjiography (CTA) and cerebral DSA were performed.

The findings are on CT and MRI dilated and serpinginous veinous structures were noted on the left side of pons, the left cerebellar hemisphere and quadrigeminal cistern (fig1-2). No venous thrombosis was discerned. On CTA, dilated venous structures were seen coursing from pons and mesencephalon and draining into petrous sinus with no obvious nidus of AVM. On DSA a dural AVF was noted that was fed by the meningohypophyseal trunk of the left ICA, the occipital branch of the left ECA with venous return into the vein of Galen. There was an aneurysmal dilatation which measured 17mm at the venous side (fig3-4).



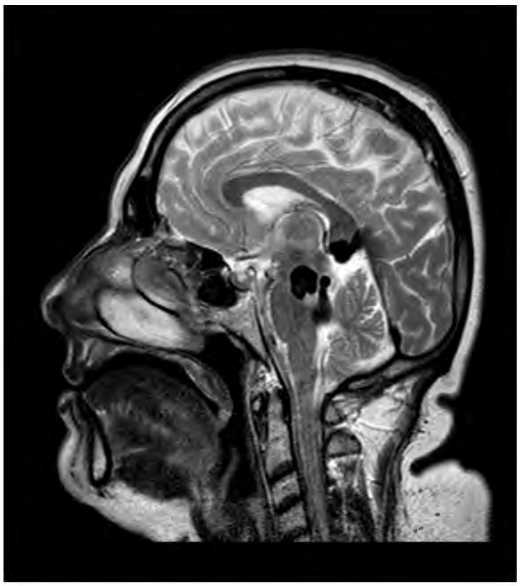
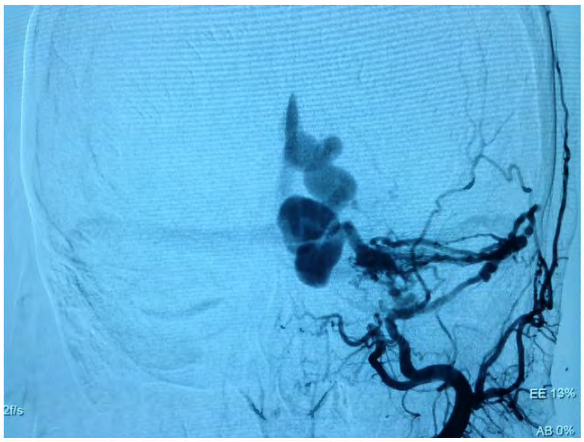


***Figure 1and 2**. Dilated and serpinginous veinous structures were noted on the left side of pons, the left cerebellar hemisphere and quadrigeminal cistern*



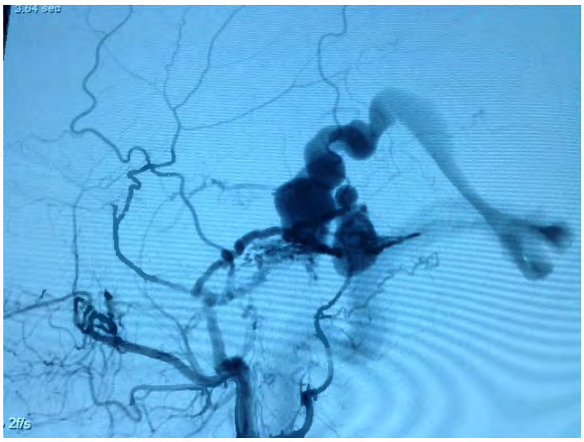


Figure 3 and 4.Dural AVF was noted that was fed by the meningohypophyseal trunk of the left ICA, the occipital branch of the left ECA with venous return into the enlarged vein of Galen.

DISCUSSION

The true incidence of DAVF is not known although in selected studies it is estimated that it comprises 10% of all intracranial AVM (1, 2). Because of its insidious course and possibility of a spontaneous remission the incidence in the medical literature may not reflect true figures (3). They can be seen virtually at any age because of their acquired nature although they are more common in older age groups compared to other AVM s (4). The forms of aggressive neurologic symptoms are seen at men more frequently (5).

Anomalous vascular connections between dural veins and cerebral arteries or dural arteries are thought to play a role in the pathogenesis. Surgery, ear infections, venous thrombosis after head trauma and oral contraceptives that may stimulate angiogenesis can be responsible for etiologic factors (6).

Also, venous thrombosis and venous hypertension can lead to the formation of microscopic venous channels which then turn into fistulae between dural veins and arteries (7).

There are two widely used systems among classification of DAVF. The Borden classification is based on the direction of flow only while the Cognard classification contains more anatomic details and details about flow direction. The Cognard classification also comprises spinal DAVF (2).

	The Borden Classification system
Tip 1	Type I DAVF drainage into a dural venous sinus or meningeal vein with normal anterograde flow. Usually benign clinical behaviour.
Tip 2	Type II Anterograde drainage into dural venous sinus and onwards but retrograde flow occurs into cortical veins. May present with haemorrhage.
Tip 3	Type III Direct retrograde flow of blood from the fistula into cortical veins causing venous hypertension with a risk of haemorrhage.

Table 1: *The Borden Classification systm*

	The Cognard Classification system
Tip 1	Normal anterograde flow into a dural venous sinus.
Tip 2a	
Tip 2b	Type IIb Drainage into a sinus with retrograde flow into cortical vein(s)
	vein(s)
Tip 3	Type III Direct drainage into a cortical vein without venous ectasia
Tip 4	Type IV Direct drainage into a cortical vein with ectasia >5mm and 3x larger than the diameter of the draining vein
Tip 5	Type V Direct drainage into spinal perimedullary veins

Table 2*: The Cognard Classification system*

The Borden classification is more widely used because of practical reasons. In our case both classifications were used because of the antegrade nature of the flow from the fistula towards the dural venous sinus and absence of cortical venous reflux. Our case has been classified as type 1for both classification because the flow direction has been antegrad and absence of cortical venous reflux.

There is a wide range of symptoms from tinnitus to intracranial hemorrhage and coma (8). On radiograms grooves in the inner calvarial tabula may be noted caused by chronic compression of dilated middle meningeal veins (10). On suspected intracranial hemorrhage noncontrast CT is preferred while in the presence of tinnitus multidetector CT can give valuable information about inner and middle ear and can detect glomus tumors. T2W MRI images are more sensitive in venous congestion and detection of infarcts than CT. In benign subtypes in which there is no cortical venous reflux CT and MRI can miss the diagnosis. DSA remains the gold standard in that it provides information about detailed anatomy and flow direction.

It can help evaluate venous drainage, the presence of retrograde flow and an AVF, cortical venous collaterals and feeding arteries.

In treatment transvenous or transarterial embolization is preferred in the first place while radiotherapy (Gamma knife) or sinus resections can also be used. In transvenous approach a femoral catheter is propagated to the receiving sinus or cortical vein via the right atrium and an embolising agent is injected here. Before the procedure is started it is essential to know the concise anatomy of the cerebral venous circulation and its hemodynamics in order to decide which vascular structure should be eliminated. Before the elimination of a dural sinus it must be certain that there exists no cortical venous reflux in the area to decrease the risk of intracranial hemorrhage. The transvenous approach has its complications including bleeding and venous infarct (4). On the other hand recurrence rate is high in the transarterial approach because of new vessel formation (6). Alternatively radiosurgery can be used in patients who cannot be treated with the above treatments modalities. This method has a smaller success rate compared to other techniques and it can take up to 12 months until a complete obstruction is obtained (11). But, as mentioned in the literature, combined therapy in the treatment of DAVF has always a higher rate of success and is thus preferred. In our case the transarterial approach was used and hystoacril in concentration of 1/12.5 has been injected to embolize the middle meningeal artery which is the main feeder of the fistula. Following the procedure repeat scans showed that the fistula disappeared completely.

CONCLUSION

DAVF can present themselves in various clinical conditions. Benign forms can be easily missed or poorly identified on conventional cross-sectional images. Like in our case DSA should be preferred because it provides detailed diagnostic information. It can also be used to evaluate the presence of a venous reflux before the treatment is planned

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