Case Report

GIANT DISTAL PICA ANEURYSM WITH MASS EFFECT IN THE POSTERIOR FOSSA

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ABSTRACT

Giant intracranial aneurysms are not uncommon, accounting for about 5% of all intracranial aneurysms, however, giant aneurysms of the posterior inferior cerebellar artery (PICA) are quite rare. PICA aneurysms, comprise 0,5-3% of all aneurysms. Distal PICA aneurysms constitute 15% of them. Rarely, they manifest the clinical signs of a posterior fossa mass lesion.

The authors present a case of giant PICA aneurysm. It was successfuly excised without any neurological deficit.

Key Words: Giant aneurysm, Posterior inferior cerebellar artery, Mass lesion

INTRODUCTION

PICA aneurysms contitute 0,5-3% of all aneurysms (1-22). Usually the aneurysm originates from the site where PICA is branching from the vertebral artery (2,3,9,13-15,17,19,23,24). According to Dernbach(3), distal PICA aneurysms were first reported by Fernet (25) in 1864, and then by Wallesch (26) in 1912, and they comprised 15% of all PICA aneurysms (6,15,17,19,27). Giant distal PICA aneurysm was first reported by Jane (28) in 1961.

In this report, we present a patient with a giant distal PICA aneurysm, who presented with cerebellar mass symptoms and signs, and review the literature.

CASE REPORT

A sixty-five-year old Caucasian male was hospitalized for evaluation of his headaches, dizziness and gait disturbance. His history revealed that he had headaches for 1 year, and, dizziness and gait disturbance for 5 months.

Cerebellar tests were pathological (dysmetria, dysdiadocokinesia, etc.) and he had a gait ataxia on the left side.

Plain x-rays were normal. Cranial CT scan revealed a mass lesion of 2,5x3,5 cm in size, hyperdense, edematous ad located in the inferomedial cerebellar hemisphere (Fig.1). MR scan depicted a well demarcated extra-axial mass lesion, with extensive edema, iso to hypointense on T1, hyperintense on T2 weighted images and compressing the vermis (Figs. 2 a,b,c). Angiography showed a PICA aneurysm, 12x13 mm in size, located in the televelotonsillary segment (Figs. 3 a,b).

Fig. 1: CT demonstrating a hyperdense tumoral mass lesion in the left cerebellar hemisphere.

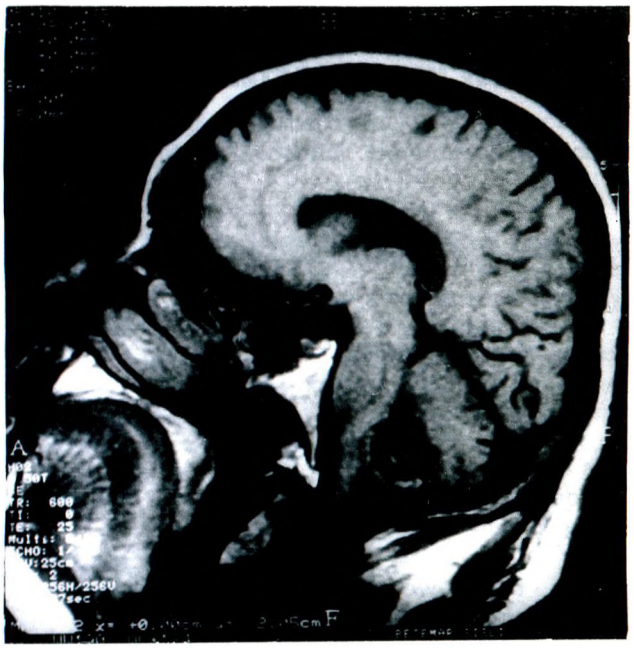


Fig. 2 a: sagittal

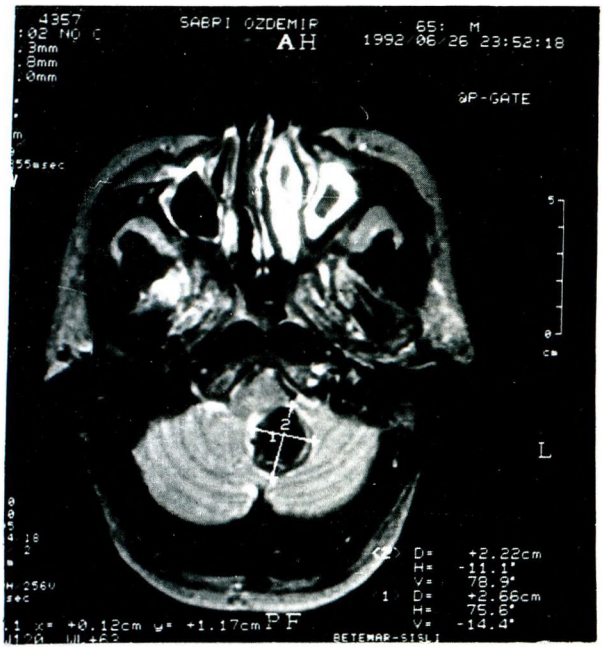
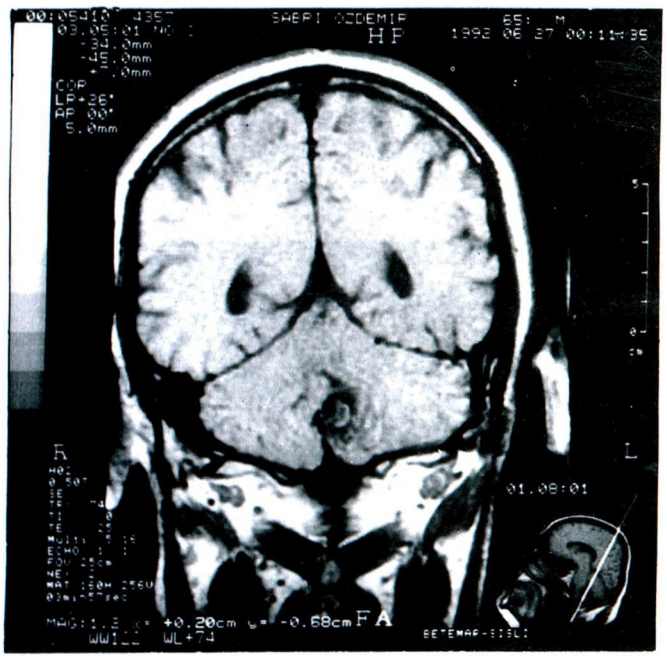


Fig. 2 b: axial



Figs. 2 a, b, c:
MR demonstrating an iso to hypointense mass lesion compressing the left posteroinferior part of the 4th ventricle.

Fig. 2 c: coronal

General endotracheal anesthesia with controlled respiration was used. The patient was in the sitting position with his head placed in a Mayfield frame. Suboccipital craniectomy and C1 laminectomy were performed, and dura was opened. Splitting the vermis we disclosed the aneurysm. Using microsurgical technique, we dissected this aneurysm, 3 cm in diameter, originating from the left televelotonsillary segment of PICA. The aneurysm was then clipped and resected.

At his follow-up examinations he had no pathological findings.

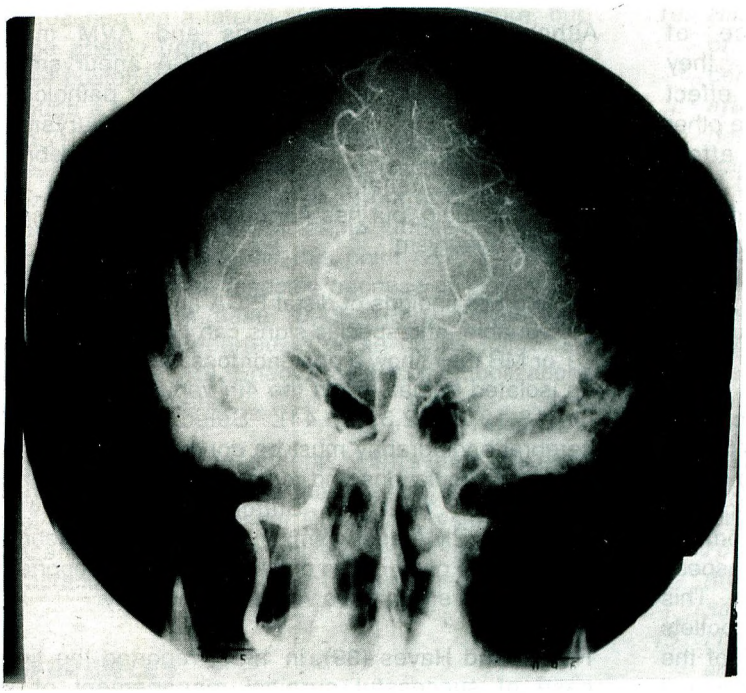


Fig. 3 a: anteroposterior

Figs. 3 a, b : Vertebral angiography demonstrating the aneurysm in the televelotonsillary segment of the left PICA.

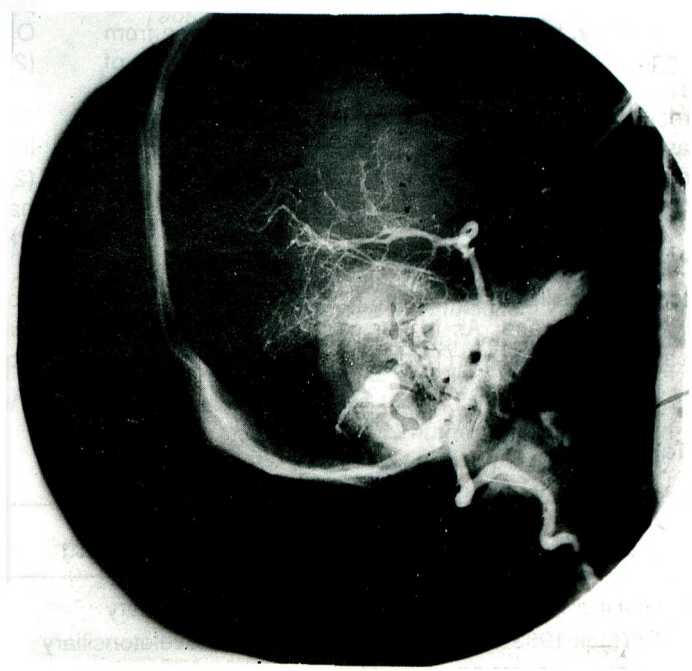


Fig. 3 b: lateral

DISCUSSION

PICA aneurysms make 0,5-3% of all aneurysms (1-22). They usually are encountered at the junction of PICA and vertebral arteries (2,3,9,13-15,17,19,23,24). Distal PICA aneurysms are rare and comprise 15% of all PICA aneurysms (6,15,17,19,27). According to Dernbach(3), the frist distal PICA aneurysm was reported by Fernet (25) in 1864. Then, with reports by Wallesch (26) in 1912 and subsequently by others, distal PICA aneurysms reached to a number of 131 (1-44). Mean age was 44,7, without any sex predilection (2,3,13,21,27).

From these 131 distal PICA aneurysms, only 9 are giant (3,6,11,22,28-30,37,38). The first was reported by Jane (28) in 1961, and was encountered in the autopsy of a 1 year old male infant who died because of acute hydrocephalus and brain stem compression. In peripheral PICA aneurysms, clinical presentation was usually with subarachnoid hemorrhage SAH characterized by a sudden prominent occipital

headache followed by a disturbance of consciousness and meningismus; rarely they presented with an intracerebellar mass effect (3,6,7,22,29-31,37,38). As in our case, 6 of the other 9 cases were admitted with mass effect (3,6,22,28,29,37). Age distribution was from 1 to 72 years with a mean of 38,5. No gender difference was present. Our case was a 65 year old male. Common symptoms and signs included nausea, vomiting, ataxia and headache. Only two cases had SAH (11,30), and another one had intraventricular hemorrhage (38).

PICA is comprised of: 1-Anterior medullary segment (AMS), 2-Lateral medullary segment (LMS), 3-Tonsillomedullary segment (TMS), 4-Televelotonsillary segment (TTS), 5-Cortical segments (CS) (7,9,35,36). The AMS runs from the anterior aspect of the brain stem to the lateral aspect. The LMS, begins as the PICA crosses olive. This segment is in intimate relation with the nerve rootlets of cranial nerves 9,10,11 and 12. The TMS of the artery begins just lateral to the cranial nerves and contains a prominent caudal loop of the artery. Small end artery, brain stem-perforating arteries arise from each of these three segments, with an average of 1.0, 1.8, and 3.3 perforations per segment, respectively. The TTs starts from the mid-tonsil and ascends to the roof of the fourth ventricle, forming the cranial loop of the artery. The CS feeds the cerebellar hemisfere (35,36).

Segmental distribution: 7 out of 9 were in televelotonsillary segment (3,6,11,22,29,30,38), as it was in our case. As in our case, 8 out of 9 were partially thrombosed. (Table I)

Although multiple aneurysms and AVM may occasionally accompany distal PICA aneurysms, there is no report on additional vascular pathology associated with giant distal PICA aneurysms (1,2,4,7,10,20,24,42). Distal location of a cerebral aneurysm is usually suggestive of mycotic or traumatic origin, but has not been reported in cases of PICA aneurysm.

CT and MR findings of distal PICA aneurysm rupture are variable, and specific signs can not be identified. CT or MR may show a posterior fossa mass lesion, or an isolated hematoma in the 4th ventricle or vermis (11,18,19,21,22,37,38,44). Selective 4 vessel cerebral angiography must be done for anterior and posterior circulations and for both sides at the same time (7,8,17,18,22,41). Sutton and Trickey (41) detected 7 PICA aneurysms in contralateral vertebral angiography of 17 cases of SAH which were reported to be negative with three vessel angiography.

Rizzoli and Hayes (39), in 1953, reported the first case of successful surgical management of a peripheral PICA aneurysm, although in a later report Olivecrona was said to have surgically treated one (2,13,16).

The surgical therapy for distal PICA aneurysms has, in general, good results. Surgical mortality is 1-3% (2,7,27,31,35,40,43). Only one patient who did not have surgical treatment died from the giant distal PICA aneurysm (28).

Location of the aneurysm is very important when planning surgical intervention. Aneurysms originating from the first two segments of PICA are best

Table I.

Author/Date	Age/Sex	PICA segment	Presentation	Treatment/Result
Jane/1961	1/M	L.Medullary	Mass effect	None/Died
Hook/1963	50/F	Televelotonsillary	Mass effect	Resection/Good
Alexander/1966	41/F	L.Medullary	Mass effect	Resection/Good
Miller/1978	61/F	Televelotonsillary	Mass effect	Surgery/Unknown
Yoshii/1979	72/M	Televelotonsillary	Mass effect	Clipping/Good
Batjer/1986		Televelotonsillay	SAH	Clipping/Good
Osenbach/1986	37/F	Televelotonsillary	IVH	Clipping/Good
Dernbach/1988	47/M	Televelotonsillary	Mass effect	Clipping/Good
Madsen/1988	65/M	Televelotonsillary	SAH	Clipping/Good
Present case	65/M	Televelotonsillary	Mass effect	Clipping/Good

SAH: Subarachnoid hemorrhage, IVH: Intraventricular hemorrhage

approached via a lateral suboccipital exposure, but those arising from the distal three segments and those posterior to the brain stem, are better handled through a midline bilateral suboccipital craniectomy (2,5,7,16,19,32,34,35,40,43). Although clipping the aneurysm neck is preferrable, trapping may be utilized in those lesions arising from or distal to the televelotonsillary segment, as no further brain stem perforators arise beyond this point (2,7,16). Giant aneurysms must be resected because of their mass effect, as in our case (8,19,31,39). End-to-end anastomosis is reported in some cases following resection (11,31,40). Endovascular coil embolization is also reported (32).

We conclude that in patients with symptoms and signs of a posterior fossa mass lesion, it should be kept in mind that, a giant PICA aneurysm may be present, and in these cases selective 4-vessel intracranial angiography must be performed.

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