Giant Intracranial Aneurysms in Infants: Case Report and Review of the Literature

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ABSTRACT

Intracranial aneurysms are extremely rare in infants and differ from those in adults in their mode of presentation, location, size, and long-term outcome. Their treatment is very complex. Our case is a 24-month-old infant who featured a giant aneurysm of the basilar trunk diagnosed at the age of 04 months by an alternate syndrome of sudden onset, with a follow-up for 2 years. Therapeutic management is much discussed between surgical treatment, endovascular treatment, and therapeutic abstention which depends on the age, location, size, and mode of installation of these aneurysms.

Keywords: Case report, Intracranial aneurysm, pediatric.

1. Introduction

Aneurysms are extremely rare in children, and the pediatric aneurysms previously reported were intracranial saccular. These cases can be divided into three age groups: neonatal (patients aged less than 4 weeks), infant (patients aged 4 weeks to 2 years), and infantile (patients aged 2 to 18 years). To date, in the literature, the number of reported cases of intracranial saccular aneurysms (ruptured and unruptured) in infants under one year of age is less than 200.

This is a different aneurysm entity from that of adults. The etiopathogenesis of intracranial aneurysms in neonates is still unclear, although trauma, infection, connective tissue disorders, and congenital vessel anomalies have been suggested as potential risk factors. In our article, we report the case of a 24-month-old infant with a giant basilar trunk aneurysm diagnosed at the age of 4 months by a sudden-onset alternative syndrome, with a follow-up of 2 years.

A good comprehensive literature review was carried out to study the clinical specificities of neonatal intracranial aneurysms, the investigations used to diagnose intracranial aneurysm, the modality of treatment as well as the clinical outcomes.

2. Cases Report

This is a 4-month-old female infant with no particular pathological history, who presented to the pediatric emergency room.

Clinically, he was a 15/15 GCS conscious infant with left hemiplegia, right eyelid ptosis (common oculomotor nerve III damage), and right facial paralysis.

All in all, this is an infant who presents with an alternating syndrome of sudden onset.

2.1. Radiological Investigation

The initial cranial investigation consisted of cerebral CT (Fig. 1). This revealed a rounded bilobed lesion that takes up the contrast product very intensely in the pre-mesencephalic area and which is related to the vertebro-basilar arterial axis.

Magnetic resonance angiography (MRA) in time of flight (TOF) and MRI with contrast (Fig. 2) revealed a clearly enhanced oval mass located in the pre-mesencephalic region in relation to the basilar trunk which exerts a mass on the midbrain, consistent with a giant aneurysm of the basilar trunk.

2.2. Staff Decision

Given the age, the location, and size of the aneurysm which is not ruptured, we did not retain any surgical indication.
An endovascular treatment was not retained by the neuroradiologists who argued this decision by the fact that the aneurysm is giant, the coiling will aggravate the mass effect, and the flow diverter will fail because the vessels are in full growth. Therefore, we retained conservative treatment with regular follow-up and MRA in 6 months.

2.3. Evolution

Two months later, the infant presented to the pediatric emergency room for macrocrania with refusal to breastfeed. We ordered a CT scan (Fig. 3) which showed active hydrocephalus. With all the risk of rupture, we decided to put a ventriculoperitoneal shunt. The immediate postoperative follow-up was simple. The infant was last seen at 2 years of age, remained stationary, conscious with sequelae left hemiplegia and right eyelid ptosis. Parental consent was required for the publication of this case.

Our case was reported in accordance with the SCARE 2020 guidelines [1].
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In this same meta-analysis which studied the therapeutic choice in 42 children with 57 aneurysms, and was based on the clinical presentation of these children and the characteristics of the aneurysm (size, location, morphology, ruptured or not): 44% benefited from endovascular treatment (who presented operative difficulties), 23% from surgical treatment (ruptured aneurysms with a wide neck) and 33% of children had conservative treatment (aneurysms at low risk of rupture, giant aneurysms). The evolution was good in the 3 groups in 89%, 92%, and 91%, respectively [8].

In our case, we chose the third option for the same reasons.

4. Conclusion

In pediatric patients with cerebral aneurysms, either endovascular and surgical treatment, or preservative treatment, gives comparable long-term clinical results in total and several major subgroups. Treating physicians can therefore reasonably recommend either treatment modality based on competent clinical assessment, aneurysm characteristics, local expertise, and patient preference. A promising prospective study will be needed to conclusively determine the relative benefits of endovascular and surgical therapy, or the preservative attitude, in the children's population.

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3. Discussion

Intracranial aneurysms in the pediatric population are fairly uncommon, accounting for less than 5% of all cerebral aneurysms in the general population. The age group most at risk is thought to be children in their late teens, with research indicating that the occurrence of aneurysms reduces significantly with age [2], [3].

3.1. Age

The occurrence of giant intracranial aneurysms in young infants below one year of age is exceptionally [4]. Studies have demonstrated that cerebral aneurysms in children are quite uncommon, constituting less than 5% of all intracranial aneurysms in the general public.

3.2. Presenting Features

Subarachnoid hemorrhage is the main cause revealing an aneurysm in infants, followed by seizures, symptoms of increased ICP, and mass effect resulting in local neurological dysfunction [5]. The latter was the telltale sign in our patient.

3.3. Imaging

The majority of pediatric patients who present with clinical symptoms evocative of an intracranial aneurysm are initially evaluated by CT or MRI [6], [7]. The same was done for our patient.

3.4. Treatment and Outcomes

In a meta-analysis, there were no significant differences between endovascular, surgical treatment, and therapeutic abstention in the long-term clinical results in children with intracranial aneurysms, including ruptured and unruptured aneurysms.

Financial Disclosure

The authors declared that this study has received no financial support.

Ethical Approval

Written informed consent was obtained from the parent's patients for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Conflict of Interest

The authors of this article have no conflict or competing interests. All of the authors approved the final version of the manuscript.

References


Fig. 3. Cerebral CT scan, non-injected axial slices.

