Clinical Case Report

Quadrigeminal arachnoid cyst in pediatrics. Is there always hydrocephalus? A case report

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Quadrigeminal arachnoid cyst are one of the rarest form of intracranial arachnoid cyst, this unique congenital malformation posses an special risk for hydrocephalus and neurological symptoms due to its proximity to the aqueduct and the brain stem.

The treatment for this cyst tends to be surgical in cases when intracranial hypertension presents by hydrocephalus. Few cases of non surgical treatment of quadrigeminal arachnoid cyst with clinical follow up has been studied in global literature .

Here it's a case of a young patient with quadrigeminal arachnoid cyst with clinical monitoring for three years without any change in symptoms and without any neurological deterioration over the time

Keyworks: arachnoid cyst, quadrigeminal, hydrocephalus, endoscopy, cerebral aqueduct

INTRODUCTION

Arachnoid cysts are a congenital fluid collection of Cerebrospinal fluid (CSF) that accounts the 1% of all brain mass lesions. (1) They are more frequently located in the middle cranial fossa but can arise anywhere in the CNS.

Quadrigeminal arachnoid cysts are rare fluid collections representing 5% of all arachnoid cysts in children. (2) Being uncommon, only 79 cases were reported in the literature, up to 2008. (3) As quadrigeminal arachnoid cysts compress or distort the cerebral aqueduct at an early stage, they are usually associated with hydrocephalus when symptomatic. Due to the compressive symptoms produced by these cysts, they must be treated when symptoms of increased intracranial pressure are shown.

Here we report a case of a young child with a quadrigeminal arachnoid cyst without signs of intracranial hypertension and without hydrocephalus, who was followed for 3 years, and had no neurological deterioration during the follow-up time.

CASE DESCRIPTION

A 10 – year old patient came to our Neurosurgery outpatient service with a brain MRI, performed 1 month ago due to a minor headache that was managed with oral analgesics at home. No signs of increased intracranial pressure were shown on the first clinical examination, and a Quadrigeminal arachnoid cyst was confirmed on the MRI without ventriculomegaly or other signs of hydrocephalus. The patient was discharged with warning signs and education to his parents about its cyst and risk of Hydrocephalus.

A control examination was performed 6 months after the first visit, and no symptoms of intracranial hypertension were referred neither by the patient or his parents. A control MRI was ordered for revision in the next 6 months.

This second MRI showed the Quadrigeminal cyst without enlargement and imagological signs of increased intracranial pressure or Hydrocephalus, the patient denied headache, seizures, vomiting, or somnolence, information confirmed by his parents. Despite the presence of the Quadrigeminal

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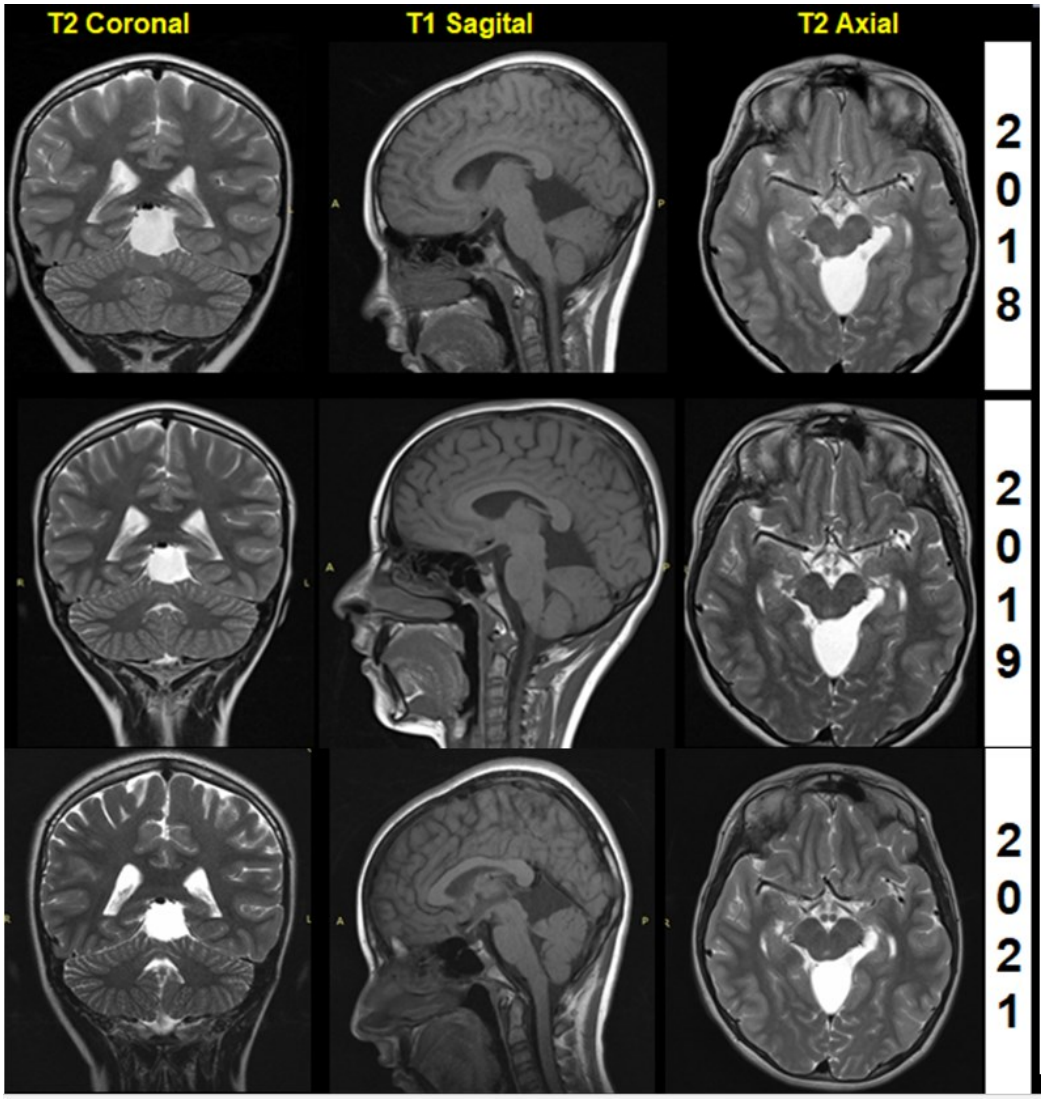

Figure 1 - Imaging evolution during three years of clinical follow up. T2 coronal image , T1 Sagittal Image and T2 axial Image , no increase in size were found during the complete follow up of the patient.

arachnoid cyst, we decided to postpone any neurosurgical intervention due to the absence of clinical and imaging signs of hydrocephalus, all the information was always given to the patient´s parents with medical education. The third MRI was performed following 3 years of the initial symptom, again the Quadrigeminal cyst was seen without signs of hydrocephalus or intracranial hypertension and the patient remained asymptomatic during the follow-up (Figure 1).

The patient now in his young adolescent years, and he was educated about the risk of hydrocephalus and intracranial hypertension, no more visits were programmed in his follow-up, and he was finally discharged with written warning signs to go to the emergency unit if any symptoms of intracranial hypertension presents at any time of his life, information that was given to his parents too.

DISCUSSION

Arachnoid cysts are a developmental abnormality that forms because of splitting or duplication of the arachnoid membrane due to a slit valve mechanism in the arachnoid membrane, other mechanisms apart of the congenital theory are the formation of the cyst after head trauma, infection, or intraventricular hemorrhage (4,5).

Posterior fossa cysts are one of the rarest forms of this entity, and the quadrigeminal location has been only diagnosed in some case reports, due to the proximity with the aqueduct, cranial nerves, and midbrain, the majority of the posterior fossa cyst tends to be diagnosed after the development of neurological symptoms due to cyst enlargement, causing symptoms of raised intracranial

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pressure like nausea, vomiting, focal neurologic deficits, or hydrocephalus. Arachnoid cysts are a common incidental finding on cranial imaging in pediatrics, it has been recommended that when symptoms appear they need to be treated surgically, however, there is still much to be learned about the natural history of asymptomatic cysts regarding which cysts will enlarge and become symptomatic in the future (6). For patients without symptoms, experts have recommended that surgery must be indicated in young children with large quadrigeminal cysts even if the cyst is apparently well tolerated, because a cyst may affect the development of the brain. However, surgical treatment should not be considered for older children and adults unless they have cyst-related symptoms (7).

Routine surveillance imaging in children with arachnoid cyst have been proposed in three different studies of the natural history of this disease, the clinical and imaging al follow-up must be done in younger patients and those with cyst ubication on critical areas like the posterior fossa due to their increased risk of intracranial hypertension syndrome. The rate of cyst enlargement has been studied to occur in 0.7 to 10% of the patients, needing surgery due to detrimental on their neurological status during the clinical follow-up (7,8,9)

In this case report, the patient appeared to the outpatient neurosurgical service with a history of minor headache, routine surveillance, imaging, and clinical follow up were done for three years, with no symptoms or any detrimental in his basal neurological status and without imaging enlargement of the cyst, the patient was discharged without any more planned visits, showing the importance to know the patient's previous status and the importance to avoid surgery in an asymptomatic child.

DISCLOSURES

Ethical approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the local Ethics Committee

Consent to participate

The patient gave consent to use his information and images for research proposes.

Consent for publication

The patient gave consent to use his information and images for publication.

Conflict of interest

The authors declare no conflicts of interest with respect to the content, authorship, and/or publication of this article.

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