A COMBINED SURGICAL APPROACH TO A SUPRASELLAR ARACHNOID CYST WITH PRECOCIOUS PUBERTY

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SUMMARY:

Arachnoid cysts of the suprasellar region are quite rare. Precocious puberty may be one of the associated clinical findings of these lesions.

In this paper, we present a case of suprasellar arachnoid cyst presenting with precocious puberty which was treated using by combined subfrontal and transcallosal transvertricular surgery.

KEY WORDS :

Arachnoid cyst, Suprasellar cyst, Precocious puberty, Computerized tomography.

INTRODUCTION

In paediatric neurosurgery practice 1% of all intracrnaial space occupying lesions are arachnoid cysts (2, 3). Suprasellar location of this uncommon pathology is rare. Following the introduction of computerized tomography (CT) to neurosurgical practice, a significant increase has been seen in suprasellar arachnoid cysts (SSAC) cases. Despite this fact. 108 cases have been reported in the literature to date with satisfactory data (6, 10). Clinical features of SSAC are hydrocephalic and compressive disturbances. But one third of SSAC cases reported in the literature were shown to have the clinical picture of true precocious puberty (11).

The aim of this report is to compare a SSAC case treated in our clinic by a subfrontal and transventricular combined approach to communicate the cyst with the ventricular system and the basal cisterns, with the findings of true precocious puberty.

CASE REPORT

A 4-year-old female was admitted to our clinic with early developed secondary sexual features and menses. Neurological examination was within normal ranges except for bilateral papilloedema. Endocrinological tests were within normal limits except for slightly high Prolactin (32ng/mL) and gonadotropic hormone (LH:7mlU/mL and FSH:12mlU/mL) levels.

Routine (Fig. 1) and coronal CT (Fig. 2) sections revealed a huge suprasellar mass implying an arachnoid cyst. The cyst membrane of 16 HU, was visible in the ventricular system. The patient was operated on, with the clinical diagnosis of SSAC and true precocious puberty. First a left frontotemporal craniotomy was performed. Examination of the subfrontal base revealed a cystic mass containing a clear cyst fluid, compressing both optic nerves upwards. After opening the cyst membrane, the resultant cavity formed a communication with the chiasmatic and interpeduncular cisterns. Then a transcallosal approach was performed where the cyst was exposed via the transventricular route and was found bulging through the foramen of Monro. The cyst was marsupialized into the left venticular system and the septum pellucidum was opened in order to connect both lateral ventricles. Histopathological examination of the cyst membrane revealed an arachnoid cyst.

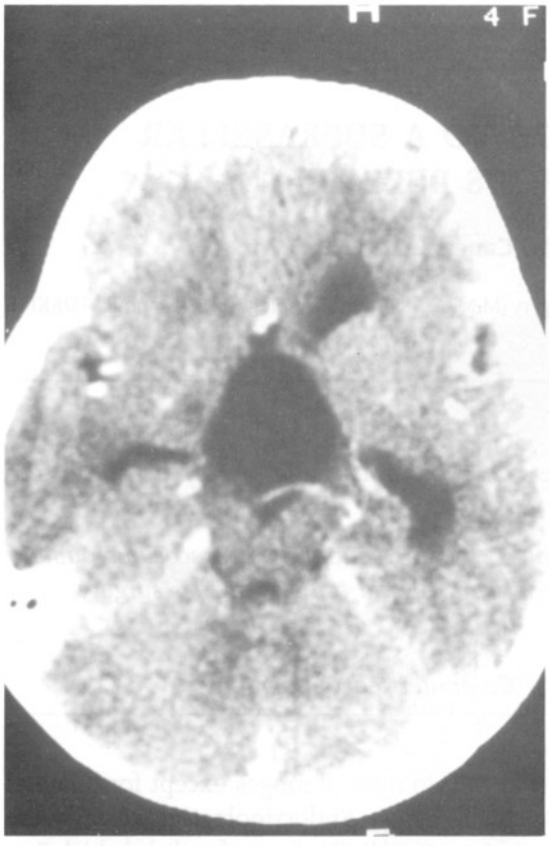

Fig. 1 : A huge suprasellar arachnoid cyst with ventricular dilatation.

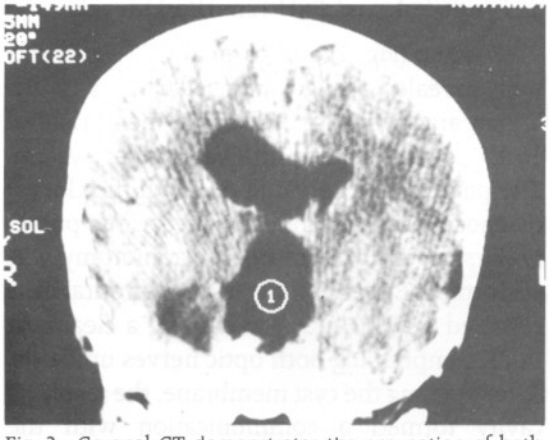

Fig. 2 : Coronal CT demonstrates the occupation of both foramina of Monro.

The postoperative course was uneventful and CT after one year was within normal limits (Fig. 3). The secondary sexual characteristics showed no progression and the preoperative high levels of Prolactin and gonadotropic hormones returned to normal limits one year.

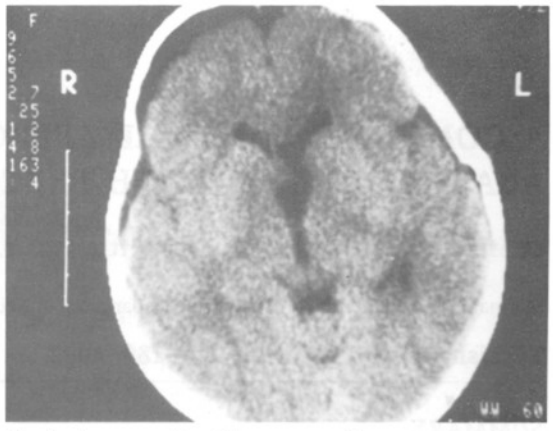

Fig. 3 : Postoperative CT one year after surgery.

DISCUSSION

Arachnoid cysts account for about 1% of intracranial mass lesions in the paediatric age group, but fewer than 15% of these are located in the suprasellar region (2, 3, 4, 9). Review of the literature reveals only 108 cases in this location (1-7, 9, 11). Most of which have been documented in recent years, with the advent of CT scanning and MRI.

The important clinical features of SSAC cases are headache, impaired visual acuity, visual field defects, ataxia, gait and endocrinee dysfunction. Most cases occur under the age of five years which underlines the importance of this pathology in childhood. Faris et al (1) were the first to describe isosexual precocious puberty in a patient with a suprasellar arachnoid cyst. Up to now only 20 patients in a total series of 108 presented with precocious puberty (1, 3, 10).

The diagnosis of SSAC is based primarly on recognition with CT or MRI. Since SSAC is very rare, only a few CT findings of isolated cases have been reported (2, 3, 4, 5, 6, 9, 10, 11). Kasdon et al. (7) reported, for the first time, a case of suprasellar arachnoid cyst diagnosed preoperatively on CT scan findings. Murali and Epstein (9) used intraventricular injection of a small amount of contrast medium for definitive diagnosis. On the other hand for investigating these patients Hoffman et al (5) advised the metrizamide ventriculogram through an implanted VP-shunt. Gentry et al. (2) stressed the variability of CSF dynamics between the ven-

tricles, cisterns and cyst cavity and preferred the use of contrast material. In our case we did not consider an invasive intervention was necessary because the occlusion of both foramen of Monro and the two dilated ventricles were easily detected on CT. In our opinion detailed coronal reconstruction with CT is enough for an exact diagnosis. With the help of this reconstruction it is possible to recognize the membrane of the cyst in the third or lateral ventricles and i.v. contrast material will show the anatomical relationship of the major arteries and the choroid plexus to the cyst. Therefore ventriculography is not really useful in the evaluation of these cases.

The correct surgical management of SSCA is still debatable (4, 6), but the main aim is to communicate the cyst with either the ventricular system or the basal cisterns or to insert a VP-shunt system to avoid hydrocephalus. In the few cases where hydrocephalus is not present, Hoffman et al. (5) prefer a subfrontal approach to make the cyst communicate with the chiasmatic basal cisterns. However, if hydrocephalus is present, they recommend the transcallosal approach after insertion of an unilateral VP-shunt as an initial step. On the other hand Murali and Epstein (9) prefer the placement of a V-P shunt followed by subfrontal exploration. But Milhorat (8) believes that some of these deep cysts are best treated only by insertion of a shunt. There is also a case reported by Werder et al. (11), where the cyst was approached with stereotaxic methods. Recently Piere-Kahn et al (10) published their experience with percutaneous ventriculostomy in 20 patients, with not very satisfactory radiological results. As mentioned, we first explored the cyst subfrontally and communicated it with the basal cisterns, then performed a transcallosal approach and reached the left lateral ventricle because it was the most dilated. Then the roof of the cyst was opened. Such treatment can cause the drainage of one lateral ventricle only and could lead to dilatation of the opposite lateral ventricle as well as the cyst. This risk also exists in cases where a V-P shunt is inserted into only one of the lateral ventricles. For this reason we opened the septum pellucidum to connect both lateral ventricles. Review of the literature revealed no case of a combined subfrontal and transcallosal approach in the same operation. The most important fact of these procedures is to avoid shunt-dependency as reported by Hoffman et al. (5) and Jones et al. (6), as with the insertion of a shunt system, the patient would be at risk to all probable shunt complications. On the other hand there is also a great risk of recurrence of SSAC with other surgical approaches. With our procedure this risk is minimised.

We Conclude That :

1) Precocious puberty is an initial symptom of SSAC.

2) Detailed CT examination with coronal reconstruction is sufficent for accurate diagnosis.

3) Thepurpose of surgical intervention must be achievement of communication between the basal cisterns, the cyst and the lateral ventricles.

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