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Original Article

Colloid cyst of the third ventricle: a clinical series of 19-cases

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Abstract

Aim: Colloid cysts are benign tumors originating from primitive neuroepithelial or endodermic origin in the third ventricle. Asymptomatic, as well as paroxysmal headache, gait disturbance, nausea, vomiting, learning difficulty and death may occur. Computed tomography (CT) is also seen as a round or oval, non-contrasting lesion. Magnetic resonance imaging (MRI) also shows hyperintense at T1 weighed and isointens at T2 weighed sequences. Stereotactic aspiration, microscopic or endoscopic approaches, shunt can be applied. Total excision should be targeted.

Material and Methods: We aimed to investigate the age, sex, complaint, hydrocephalus presence, neurological examination findings, surgical method and results of 19 cases of colloid cyst in our clinic between 2012-2017.

Results: Eleven of 19 cases were female (57.9%) and 8 were male (42.1%).The average age was 27.2 (2-62). The most common complaint was headache. Ptosis due to visual disturbance was seen in 5.3% (1 patient), ataxia in 10.5% (2 patients), hydrocephalus with memory loss in 31.5% (6 patients). Six patients underwent cystectomy with endoscopic third ventriculostomy (ETV) and transcranial surgery in 13 patients. Ventriculoperitoneal shunt was performed to one patient at eight months after surgery. Rhinorrhea and menengitis was seen in one patient. Medical theraphy was given to this patient. One patient died because of acute cerebral anfarct.

Conclusion: Asymptomatic old patients must be followed periodically. Symptomatic patients must be treated surgıcally and it must be combined by V-P shunt if patients had hydrocephalus. One of the surgıcal endoscopic or transcranial technics can be selected. Transcortical or interhemispheric technic may be preferred from transcranial technics.

Keywords: Colloid Cyst; Total Resection; Hydrocephalus; Endoscopic Third Ventriculostomy.

INTRODUCTION

The colloid cyst, also known as the neuroepithelial cyst, is a slow-growing benign tumor. It has been introduced by Wallman in 1858. They usually occur at the rostral part of the third ventricle. Compressing the foramen of Monro, it results in lateral ventricle dilatation. It constitutes 0.5-1% of all intracranial tumors. It is gender-free common between Decades 3 and 5. The most frequent finding and symptom of colloid cysts is headache. Nausea, vomiting, altered mental status, visual impairments, memory loss, and abnormal gait are relatively rare symptoms. The surgical resection is recommended for symptomatic patients. Most of the symptoms are related to hydrocephalus. They rarely result in intracranial herniation and death.

The colloid cysts have a viscous gelatinous or viscous dense content. An approximate 75% of them are hyperdense, 25% isodense, and rarely hypodense to normal neural parenchyma in CT sections. The discrimination of a colloid cyst content may be evaluated through custom or conventional sequences via magnetic resonance imaging (MRI). MRI is used to follow the localization and signalization characteristics and complications of the lesions on obstructive hydrocephalus presence of lateral ventricles in the computerized tomography (CT).

The signaling characteristics of the cysts in MRI vary as a result of the cyst content and density being variable. They most commonly identify as hyperintense in T1 series and hypointense in T2 Series.

Although they are benign and small, due to the critical location of their residence, they may result in significant morbidity and mortality. They may cause acute hydrocephalus and sudden death. However the common CT and MRI use allows to identifying them before these cysts grow up to create a hydrocephalus.

It is known that within the follow-ups of the asymptomatic patients with a cyst size less than 1 cm the cysts may grow in size. Aligning the slow growing cysts with foramen of Monro without obstructing the cerebrospinal fluid (CSF), the patient is ensured to remain asymptomatic. In case

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of rapid dimensional progression, which means the cyst diameter reaching 1 cm, the possibility of complication occurrence gets increased.

Cystectomy is applied to symptomatic patients with concomitant hydrocephalus in combination with ETV or V-P shunt. The suitable procedure, among the endoscopic or microsurgery methods, is combined in the surgery.

MATERIAL and METHODS

We aimed to investigate the age, gender, complaint, hydrocephalus presence, neurological examination findings, surgical method and results of 19 cases of colloid cyst in our clinic between 2012-2017. Clinic, radiologic, histopathological examinations were conducted for diagnosis. Cases were scanned retrospectively, file details, imaging results, surgery notes were reviewed.

RESULTS

11 of 19 cases (57.9%) were female and 8 of them (42.1%) were male. Average age was found to be 27.2 (2-62). The most frequent complaint on admission was headache with 84.2% (16 cases). Ataxia and visual impairment (ptosis related to third cranial nerve paralysis complaints were seen in 10.5% (2 cases) and 5.3% (1 case) of the population, respectively (Table 1). The onset of the complaints varied between 15 days and 3 years.

Table 1. Gender, complaint, imaging methods, distribution of the neurological examination findings

Colloid Cyst		Number	Percent %
Gender	Male	8	42.1%
	Female	11	57.9%
Comlaint	Headache	16	84.2%
Atatxia	2	10.5%	
	Visual Impairment	1	5.3%
Imaging Methods	Ct And Mri Mri Only	17 2	89.5% 10.5
Neurological Examination	Motor Deficit	-	-
	Visual Impairment	1	5.3%
	Hydrocephalus Findings Papilla Stasis	6	31.5%

Ptosis related to third cranial nerve paralysis was seen in a single patient with visual impairment in their neurological examination. In 6 of the 16 patients with headache, radiologic (Figures 1) and clinical hydrocephalus findings were encountered, and indistinction of the borders of iris in the funduscopic examination. Of 19 cases, MRI was used in 89.5% (17 cases) in combination with CT, and MRI was used alone in 10.5% (2 cases). MRI was performed in all the cases.

Gross total resection was performed in 94.7% (18 cases) and subtotal resection was performed in 5.3% (1 case) of the cases, and some cyst wall was remained as a residue. Cystectomy was performed in 31.5% (6 cases) through endoscopic approach, 31.5% (6 cases) through microscopic transcortical approach, and 37% (7 cases) through microscopic transcallosal approach (Table 2).

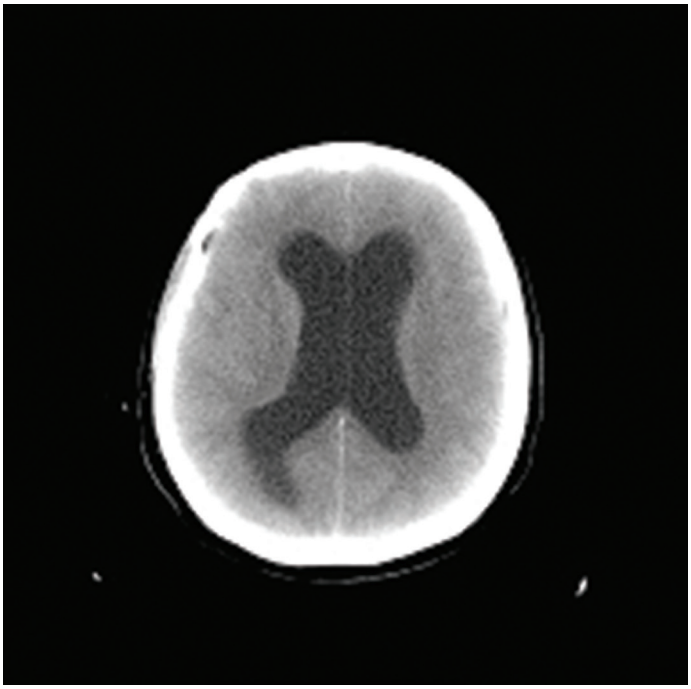

Figure 1. Preop axial section of the brain CT.

Table 2. Surgeries performed and methods thereof

Colloıd Cyst		Number	Percent %
Performed Surgery	Gross Total Excision	18	94.7%
	Subtotal Excision	1	5.3%
Surgical Options	Endoscopic	6	31.5%
	Transcortical	6	31.5%
	Transcallosal	7	37%

Evaluating the surgical results, V-P shunt was applied to a patient upon development of hydrocephalus at postop Month 8. A fair amount of cyst wall was remained as a residue in the case with third cranial nerve paralysis, and no growing up and no change in neurological manifestation were seen at postop Month 12 follow-ups. ETV was applied to 6 patients found to be with preop hydrocephalus in combination with cystectomy (Figures 2, 3 and 4).

All the 6 cases had improvement in their postop neurological manifestations. A case of ours that we applied transcranial intervention within the postop period was hospitalized and received medical treatment upon the occurrence of rhinorrhea and meningitis at first month. Another case of ours that had cystectomy through transcranial interhemispheric approach died

at postop Day 5 as a result of acute cerebral infarction. Patients were followed for 17.4 months on average (6-36 months), and no radiology and clinical recurrence and complaint were found in our cases within their radiology and clinical follow-ups.

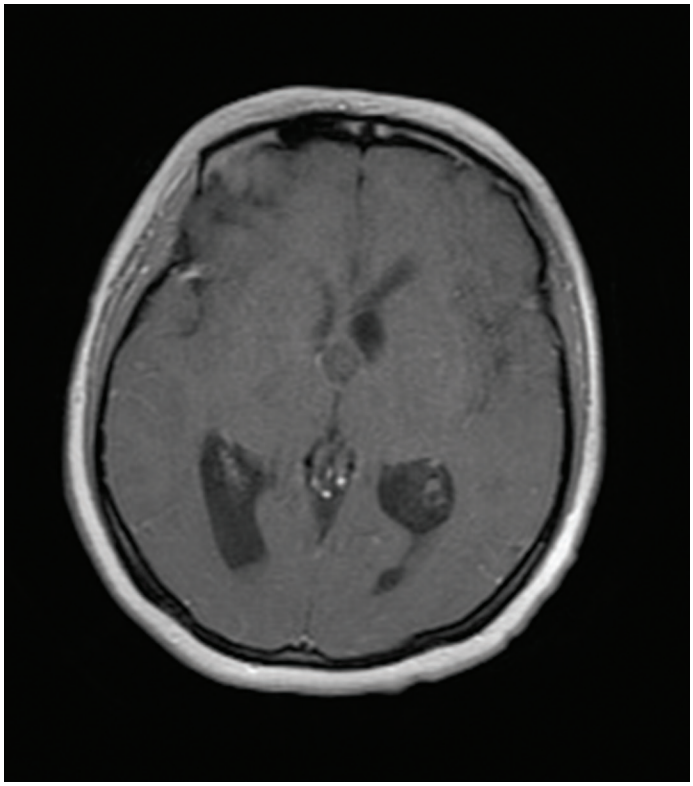

Figure 2. Preop contrasted T1A axial section MRI.

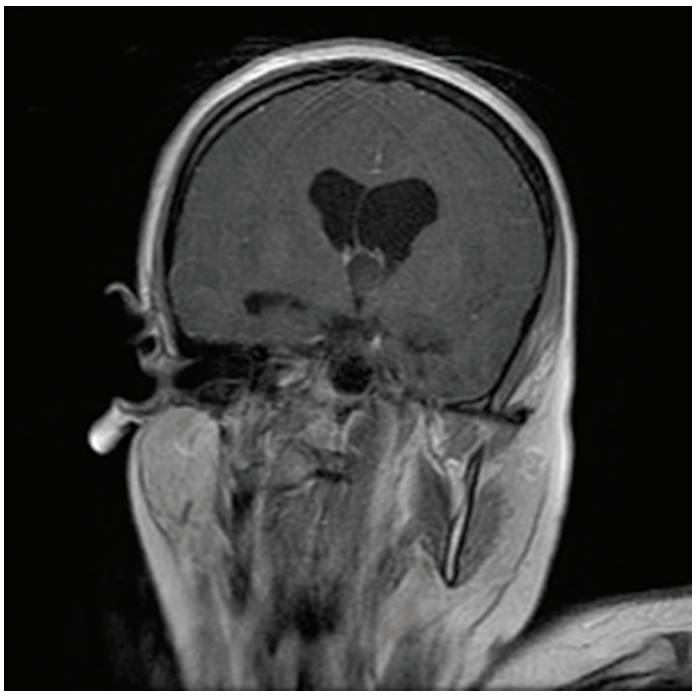

Figure 3. Preop contrasted T1A coronal section MRI.

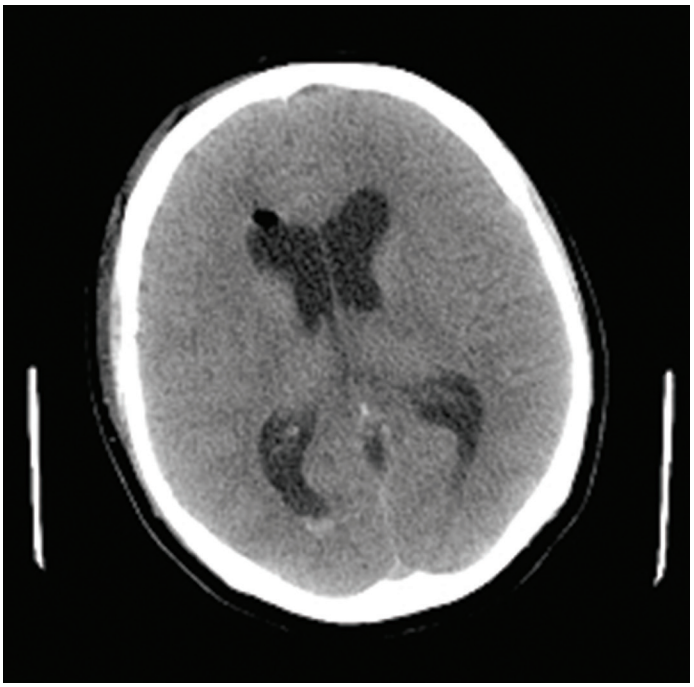

Figure 4. Brain CT after ETV+cystectomy surgery.

DISCUSSION

Considering the etiology, the origins of colloid cysts are uncertain, and the onset theories indicates that they may be originated from neuroepithelium, paraphysis, ependyma, or choroid plexus. Some researchers, sticking to the morphological analysis performed, suggested it to be originating from alternative endoderm (1,2). Also some suggest that it has a similar origin to Rathke's cyst (3). Most of the patients with colloid cyst are asymptomatic, and their clinical manifestations may be worsened. Asymptomatic cysts without a ventriculomegaly smaller than 1 cm were reported to develop spontaneous resolution (4). Asymptomatic patients should be carefully and regularly followed clinically and radiologically. Sudden deaths were reported in cases with cysts larger than 1 cm (6).

Worsening related to the enlarging cyst may be seen in patients asymptomatic for a long period of time (5, 6). Colloid cysts may present via obstructive hydrocephalus and paroxysmal headache. The headache characterizes to be worsening in mornings, short term, severe, and localized in frontal head. Ataxia, nausea, vomiting, behavioral disorders, visual impairments, and sudden falls without sensory loss may occur, and sudden deaths related to the increased intracranial pressure rises (7). In our study, headache was found to occur in 84.2% (16 cases), ataxia was found to occur in 10.5% (2 cases), and visual impairment (third cranial nerve paralysis) was found to occur in 5.3% (1 case).

Generally examining the colloid cysts, the average age varies in Decades 4 and 5 and gets increased to Decade 7. No gender is dominant (8).

Although it is not evident in our study as well, females are superior in Decade 5 patient population with a ratio of 57.8% (11 cases). 10.5% of the population (2 cases) was smaller than 10 of age. Reviewing the literature, this tumor group is rare in pediatric population but has a more aggressive clinical and radiology course than adult population, and early surgery is recommended (9,10).

Familial colloid cysts are reported between mother and daughter and sisters and brothers. Although they generally locate in third ventricle, the literature data indicate them to possibly locate in suprasellar region, lateral ventricle, frontal and pontomesencephalic area, parietal convexity, and cerebellar region (11). Calcification and hemorrhage rarely occur, and cyst sizes vary between 5 and 25 mm (11). Cyst measurements of all our cases in our study turn out to be smaller than 1 cm, and no calcification and hemorrhage were encountered in our cases.

The management of the colloid cysts may vary including stereotactic aspiration, microscopic or endoscopic resection, and shunt surgery. ETV and V-P shunt may be combined with cystectomy in cases with concomitant hydrocephalus. Stereotactic treatment has a high recurrence ratio and results in limited cyst content aspiration and partial cyst wall resection (12). We did not perform stereotactic aspiration in any of our cases of our study.

Symptomatic cases with a cyst size larger than 1 cm, growing cyst, or hydrocephalus related cyst are received surgical treatment (5). Microscopic trancallosal or transcortical approach is preferred in surgery. Transcallosal approach is a direct and safe method in cases without ventriculomegaly. Short operation period, well total resection ratio, and minimum morbidity rate are benefits of this approach (13). There is a low possibility of disconnection syndrome and behavioral disorder occurrence as a result of the anterior callosotomy limited to a callosal incision smaller than 1 cm (14). In our study, 53.8% (7 cases) of 13 cases having microscopic surgery had surgical cystectomy through transcallosal approach.

Microscopic transcortical approach is preferred as a safe and effective method in conditions with lateral ventricle dilatation. It is a technique yielding good results although it may result in minimal retraction and brain parenchymal injury. In our study, 46.2% (6 cases) of 13 cases having microscopic surgery had surgical cystectomy through transcallosal approach.

Endoscopic surgery is increasingly used in brain, spinal column, and skull base lesions (17,18,19,20,21, 22,23,24,25,26). It is a minimal invasive method allowing a well visualization (27). In colloid cyst patients with a normal size ventricular system, endoscopic colloid cyst resection may result in vein and nerve injuries. As it visualizes a limited ventricular area, the total resection of the cyst wall may reveal inadequacies. Such risks may occur in cases with normal ventricle size as well as those with ventriculomegaly (28, 29). In our study, in a patient among those we performed cyst excision via endoscopic approach, the cyst wall could not be totally excised, and some residues was remained from the wall.

CONCLUSION

The complications that we may encounter in colloid cyst surgery include symptomatic or asymptomatic recurrences, intraventricular or intraparenchymal hemorrhages, and fornix injuries along with anterograde and retrograde amnesia. The recurrence risk with gross total excision and coagulation of the colloid cyst wall is minimal. Asymptomatic recurrences may be seen in long term results of the endoscopic approach. Asymptomatic residual cyst wall may be encountered following subtotal coagulation and resection of the cyst wall. The total excision should be the purpose of the surgery. As it tends to have a more clinically and radiologically aggressive course within the pediatric age, those colloid cyst cases encountered by chance are recommended to get an early stage surgery.

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