Asian Journal of Case Reports in Surgery

8(3): 20-25, 2021; Article no.AJCRS.67363

Colloid Cyst of the Third Ventricle: Clinical Improvement and Satisfactory Outcome after Cystoperitoneal Shunt (Case Report)

Ferry Wijanarko[1], Untung Alifianto[1], Hanis Setyono[1], Geizar Arsika Ramadhana[1], Galih Santoso Putra[2], Ikhdin Saadhi[2*] and Urray Yessika Bianthi[2]

[1]Department of Neuro Surgery, Dr. Moewardi General Hospital, Faculty of Medicine University of Sebelas Maret, Surakarta, Indonesia.
[2]Resident of Surgery, Dr. Moewardi General Hospital, Faculty of Medicine University of Sebelas Maret, Surakarta, Indonesia.

Authors' contributions

This work was carried out in collaboration among all authors. Author FW designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors UA and HS managed the analyses of the study. Authors GAR, GSP, IS and UYB managed the literature searches. All authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Prof. José Francisco de Sales Chagas, Sao Leopoldo Mandic Medical School, Brazil.
Reviewers:
(1) Jurandyr Santos Nogueira, Federal University of Bahia, Brazil.
(2) Neydi Osnaya Romero, Instituto Nacional de Pediatria, Mèxico.
(3) Sameer Shankar Futane, Sahyadri Super-Speciality Hospital, India.z
Complete Peer review History: http://www.sdiarticle4.com/review-history/67363

Case Report

Received 14 February 2021
Accepted 19 April 2021
Published 26 April 2021

ABSTRACT

Aims: To report a case of colloid cyst of the third ventricle, the flow of diagnosis, and the management of the case.
Case Description: We reported a case of a colloid cyst of the third ventricle in a 24-year-old man. The patient presented with major complaint of both the upper and lower left extremities. The patient often experienced headaches and felt weak in the upper and lower left limbs, which worsened until the patient could not walk and do activities. Head's MRI with contrast obtained mass predominant cystic mixed with blood, encapsulated, bounded firmly located in suprasellar. The cystoperitoneal shunt was performed on the patient.

**Corresponding author: E-mail: misterikhdin@gmail.com;*

Discussion: A patient was reported with the diagnosis of colloid cyst of the third cerebral ventricle with non-communicant hydrocephalus, underwent cystoperitoneal shunt. After CP shunt, the patient's condition improved, clinical symptoms of headache decreased, motor strength of the limb increased, and the patient could do some independent activites.

Conclusions: One case of colloid cyst of the third cerebral ventricle was handled with the cystoperitoneal shunt. The patient had non-communicant hydrocephalus due to fluid obstruction. The patient's condition improved after the cystoperitoneal shunt. The operation was done without further complications.

Keywords: Colloid cyst of the third cerebral ventricle; non-communicant hydrocephalus; cystoperitoneal shunt.

1. INTRODUCTION

Colloid cysts are rare intracranial benign cysts that occur three individuals per million per year and are responsible for 0.5% - 1% of primary brain tumors and 15-20% intraventricular mass. More than 99% are found wedged in the foramen of Monro. The cyst is usually attached to the anterosuperior portion of the third ventricle roof. Colloid cysts are rarely found elsewhere, such as the lateral ventricle, cerebellar parenchyma, and pituitary gland [1]. Colloid cysts are commonly found in adults, usually in the fifth to sixth decade of life. Even relatively small intraventricular colloid cysts can produce sudden acute hydrocephalus. Sometimes, brain herniation with rapid clinical deterioration and even death occurs [2].

2. PRESENTATION OF CASE

We presented a male aged 24 years who came with a major complaint of weakness both upper and lower left extremities. One week before being admitted to the hospital, the patient often experienced headaches and felt weakness in the upper and lower left limbs, which worsened until the patient could not walk and do activities. Based on the physical examination results, the patient was compos mentis with GCS E4V5M6, anisocoria pupil, light reflex (+/+), and lateralization to the right.

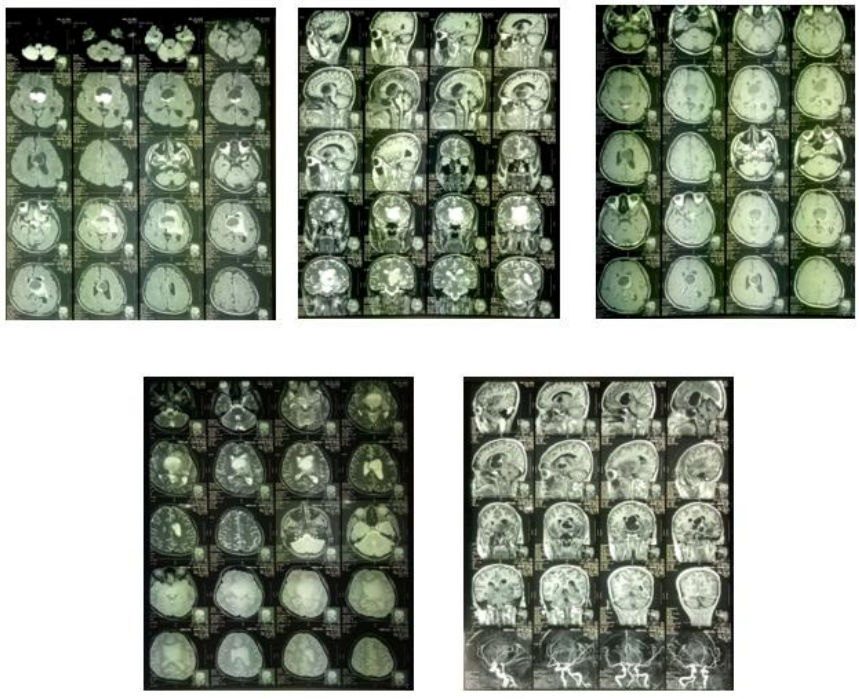

Fig. 1. The Result of Head MRI with Contrast

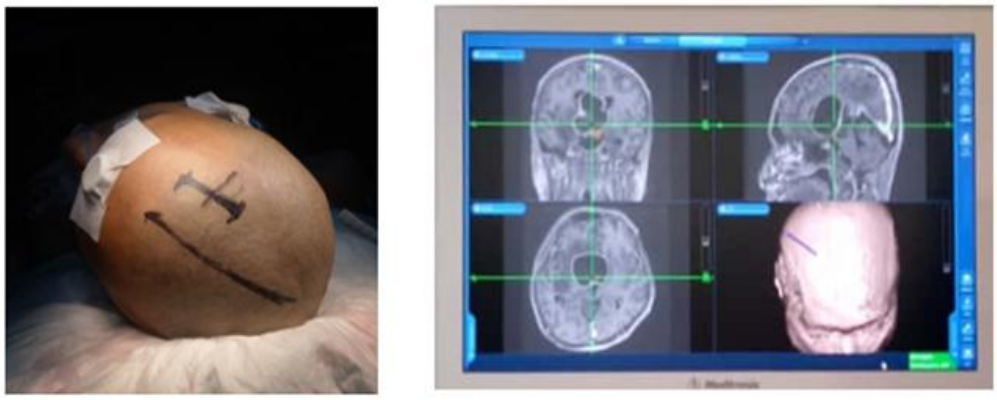

Fig. 2. Durante Operation during the Cystoperitoneal Shunt Surgery

Head MRI with contrast showed above obtained masses predominant cystic mixed with blood, encapsulated, bounded firmly situated in suprasellar. The mass measured 58.5 mm x 49.8 mm x 51.8 mm. There was perifocal edema. Lateralization to the right as far as 16.5 mm and without calcification was obtained. The results of the MRI head without contrast led to the diagnosis of metastasis pituitary and craniopharyngioma.

From the results of pathological anatomy examination obtained colloid substances, mononuclear cells between degenerative tissue and not obtained malignancy. Based on the pathological anatomy examination results, the patient's final diagnosis was a colloid cyst of the third cerebral ventricle.

The patient showed improvement after cystoperitoneal surgery. Clinical symptoms of headache decreased, motor strength of the limb increased, and the patient could do an independent activity. The operation was done without further complications.

3. DISCUSSION

Colloid cysts are extremely rare, accounting for 0.5% –2% of all intracranial tumors and 15–20% of intra-ventricular neoplasms [2]. In a previous case report, the probability of colloid cysts occurring within two or more family members was calculated as 1×1010 or 1 in 10,000,000,000 [3]. This calculation implies a genetic component involved in colloid cysts rather than a statistical chance of co-occurrence in first-degree relatives. The genetic mechanism involved in the development of familial colloid cysts and the mode-of-inheritance remains unknown. The literature surrounding this topic currently exists only in case reports and is purely speculative [4]. Several intracranial anomalies have been described in association with colloid cysts, including xanthogranuloma [5,6], astrocytoma [7], and arteriovenous malformation, any of which could provide further insight into the pathophysiology of colloid cyst development. Our case presented an intracranial association between a colloid cyst and non-communicant hydrocephalus.

Surgical consideration for incidentally diagnosed with colloid cysts of the third ventricle varies widely among institutions, with operative intervention rates ranging between 0% and 57.1% [8-10]. This disparity in management may be explained in part by variation in clinician's judgment and experience, differences in institutional protocols, the timing of evaluation and, in general, a paucity of robust literature on the natural history of these lesions. Symptomatic or large colloid cysts may present with headache and can be associated with nausea and vomiting, blurred vision, gait ataxia, and altered cognition [11-13]. Because of its location, an enlarging cyst may cause obstructive hydrocephalus, resulting in acute rapid neurological deterioration and sudden death.

The study by O'Neill AH *et al.* also demonstrated that at least 30% of the patients with incidental colloid cysts had some degree of hydrocephalus at the time of diagnosis, indicating a degree of cerebrospinal fluid (CSF) flow obstruction during the patient's lifetime [14]. However, the literature has suggested that it is likely that most will stop growing and reach a steady-state of CSF flow and reabsorption without causing significant symptoms [14-16]. Data on radiological

surveillance has revealed that at least 10% of cysts will progress over time, thus underscoring the importance of ongoing regular surveillance neuroimaging. Interestingly, some cysts do spontaneously regress in size, seen in 2.0% of patients in a pooled analysis [11,17,18]. The mechanism by which the regression occurred is unclear; however, it has been postulated to be the result of asymptomatic cyst rupture [16,19].

The most-concerning presentation of a colloid cyst is an acute neurological deterioration, which has been reported in between 3% and 45% of patients, with an associated 5% -38% risk of death [11,12,20–23]. It is thought to be caused in most cases by rapid enlargement of the cyst leading to acute obstruction of the foramen of Monro, causing acute hydrocephalus and cerebral herniation [14,15,21]. However, alternative proposed mechanisms include disturbance of hypothalamic-mediated cardiovascular reflex control, venous infarction, spinal cord infarction, neurogenic pulmonary edema, and intra-cystic hemorrhage [24-28]. Our case presented acute neurological deterioration resulting from obstructive hydrocephalus.

A systematic review by O'Neill AH *et al.* has documented one confirmed case of acute neurological deterioration resulting from obstructive hydrocephalus and a cyst-related mortality rate of 0.8% over four years [14]. Gerald Musa *et al.* reported that acute deterioration in the colloid cyst is rare but can be fatal. Associated symptoms such as severe headache and vomit. Seizures are commonly seen in patients in the first two decades. Given the risk of acute deterioration and mortality, headaches should be thoroughly investigated, and all patients diagnosed with a colloid cyst > 1 cm should be offered surgical management regardless of symptom profile [29].

Gerald Musa *et al.* showed the natural history of colloid cysts and their management. Gerald Musa *et al*. divided it into two broad categories: compensated and acute decompensation, which can be symptomatic or asymptomatic, usually presenting as chronic hydrocephalus. In the absence of surgery, these patients may progress into acute decompensation, remain asymptomatic or with chronic symptoms. Acute decompensation may result from an acute severe increase in ICP due to intracystic hemorrhage or acute obstruction of the foramen of Monro, and in the absence of immediate surgical intervention, brain herniation occurs. Acute decompensation may also occur without significant hydrocephalus due to compression of the hypothalamus. In the absence of immediate surgical intervention, autonomic dysfunction eventually leads to sudden cardiac failure [29].

Shunt is one of hydrocephalus management to secrete excess cerebrospinal fluid (CSF) by creating a channel between the brain's ventricles and a drainage cavity. The most common shunt is creating a channel into the peritoneum (cystoperitoneal shunt), shunt to the right atrium (cystoatrial shunt), and pleural cavity (cystopleural shunt). A cystoperitoneal shunt (CP shunt) with endoscopic ventriculostomy to the third ventricle is another alternative to treat obstructive hydrocephalus [29].

The success of the operation of VP shunt depends on the meticulous work of the clinicians, studies of the CSF, the appropriate selection of the type of the shunt, the use of prophylaxis antibiotic and treatment post surgery. The complications of shunt is infection that may increase the risk of cognitive impairment and also ventricular loculation can even cause death [29].

4. CONCLUSION

Colloid cysts are rare intracranial lesions, the most common colloid cysts are in the anterior portion of the third ventricle. Hydrocephalus can occur in colloid cysts, although the degree of hydrocephalus does not always depend on the size of the cyst. Hydrocephalus can occur because of a blockage in the foramen of Monro. Cystoperitoneal shunt permanently in cystic colloidal management offers the choice of more conservative treatment and can be used for patients of advanced age who refuse surgery excision of the cyst. Based on our case, the patient's condition improved after the cystoperitoneal shunt.

CONSENT AND ETHICAL APPROVAL

As per university standard guidelines, participant consent and ethical approval have been collected and preserved by the authors.

ACKNOWLEDGEMENTS

The authors received no specific grants from any funding agency in the public, commercial, or not-for-profit sectors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Benoiton LA, et al., Familial colloid cyst, J. Clin. Neurosci. 2014;21(3):533-535.
2. Aggarwal A, Corbett A, Graham J. Familial colloid cyst of the third ventricle, J. Clin. Neurosci. 1999;6(6):520-522.
3. Hernesniemi J, et al. Microsurgical treatment of third ventricular colloid cysts by interhemispheric far lateral transcallosal approach-experience of 134 patients, Surg. Neurol. 2008;69(5):447-4533.
   (Discussion 453-6).
4. Hadfield MG, Ghatak NR, Wanger GP. Xanthogranulomatous colloid cyst of the third ventricle, Acta Neuropathol. 1985;66(4):343-346.
5. Matsushima T, et al. Mixed colloid cyst-xanthogranuloma of the third ventricle. A light and electron microscope study. Surg. Neurol. 1985;24(4):457-462.
6. Gelabert M, et al. Coincidence of a frontal lobe astrocytoma and colloid cyst of the third ventricle, Neurochirurgia (Stuttg). 1991;34(2):69-70.
7. Niknejad HR, et al. Huge familial colloid cyst of the third ventricle: An extraordinary presentation. Surg. Neurol. Int. 2015;6(suppl. 11):S349-S353.
8. Kondziolka D, Lunsford LD. Microsurgical resection of colloid cyst using a stereotactic transventricular approach. Surg Neurol. 1996;46;485-90.
   (Discussion 490-2).
9. Mathiesen T, Grane P, Lindgren L, Lindquist C. Third ventricle colloid cysts: A consecutive 12-year series. J Neurosurg January 1997;86:5-12.
10. Desai KI, Nadkarni TD, Muzumdar DP, Goel AH. Surgical management of colloid cyst of the third ventricle-a study of 105 cases. Surg Neurol. 2002;57:295-3-2.
    (Discussion 302-4).
11. Beaumont, Beaumont T, Limbrick D, Rich K, Whippold F, Dacey R. Natural history of colloid cysts of the third ventricle. J Neurosurg. 2016;125:1420-3.
12. Little JR, MacCarty CS. Colloid cysts of the third ventricle. J Neurosurg. 1974:40:230-5.
13. Kaye AH. Essential neurosurgery. John Wiley & Sons; 2009.
14. O'Neill AH, et al. Natural history of incidental colloid cyst of the third ventricle: A systematic review. J Clin Neurosci; 2018.
15. Pollock BE. Schreiner SA, Huston IJ. A theory on the natural history of colloid cysts of the third ventricle. Neurosurgery. 2000;46:1077-83.
16. Peeters SM, Daou B, Jabbour P, Ladoux A, Abi Lahoud G. Spontaneous regression of a third ventricle colloid cyst. World Neurosurg 2016;90:704.e19-22.
17. Annamalai G, Lindsay KW, Bhattacharya JJ. Spontaneous resolution of a colloid cyst of the third ventricle. The British Journal of Radiology. 2008;81:e20-2.
18. Gbejuade H, Plaha P, Porter D. Spontaneous regression of a third ventricle colloid cyst. Br J Neurosurg. 2011;25:655–7.
19. Motoyama Y, Hashimoto H, Ishida Y, Iida JI. Spontaneous rupture of a presumed colloid cyst of the third ventricle: Case report. Neurol Med Chir. 2002;42:228–31.
20. Greenberg MS. Handbook of neurosurgery. 8th ed. New York: Thieme; 2016.
21. De Witt Hamer PC, Verstegen MJT, De Haan RJ, Vandertop WP, Thomeer RTWM, Mooij JJA, et al. High risk of acute deterioration in patients harboring symptomatic colloid cysts of the third ventricle. J Neurosurg. 2002;96:1041–5.
22. Ryder JW, Kleinschmidt-DeMasters BK, Keller TS. Sudden deterioration and death in patients with benign tumors of the third ventricle area. J Neurosurg. 1986;64:216–23.
23. Sheikh AB, Mendelson ZS, Liu JK. Endoscopic versus microsurgical resection of colloid cysts: A systematic review and meta-analysis of 1278 patients. World Neurosurg. 2014;82:1187–97.
24. Turillazzi E, Bello S, Neri M, Riezzo I, Fineschi V. Colloid cyst of the third ventricle, hypothalamus, and heart: A dangerous link for sudden death. Diagn Pathol. 2012;7:144.
25. Findler G. Neurogenic pulmonary edema associated with a colloid cyst in the third ventricle. J Neurosurg. 1980;52:395–8.
26. Siu TL. Spinal cord infarction complicating acute hydrocephalus secondary to a colloid cyst of the third ventricle. Case report. J Neurosurg Spine 2005;3:64.

27. Godano U, Ferrai R, Meleddu V, Bellinzona M. Hemorrhagic colloid cyst with sudden coma. Minim Invasive Neurosurg. 2010;53:273–4.
28. Jeffree RL, Besser M. Colloid cyst of the third ventricle: a clinical review of 39 cases. J Clin Neurosci. 2001;8:328–31.
29. G. Musa, K. Sinfukwe, A. Gots et al. Clinical and radiological characteristic in fatal third ventricle colloid cyst. Literature review. Journal of Clinical Neuroscience. 2020;82:52-55.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/67363