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Case Report

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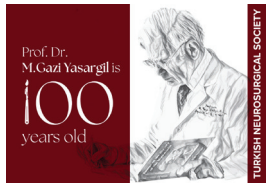

Cranial Dura Breach by Extradural Skull Base Hydatid Cyst Leading to Intraventricular Spread: A Novel Case of Intraventricular Spread

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ABSTRACT

Intraventricular hydatid cysts are extremely rare. Till date, these cysts have been believed to originate from the ventricle itself. Of the various intraventricular cysts, primary solitary cysts are the most common ones. These cysts are purely intraventricular or partly parenchymal with an intraventricular spread. These cysts have so far never been reported to spread contiguously from the extradural location, breach the dura, and thereafter, migrate intraventricularly. Here, we present a unique case of intraventricular spread of an extracerebral hydatid cyst after a dural breach. The ability of hydatid cysts to breach the dura has not been described previously. The pathogenesis of the hydatid cyst has been discussed here along with its surgical and medical management.

KEYWORDS: Intraventricular hydatid cyst, Dural breach, Intraventricular migration, Cerebral hydatid cyst, Hydatid cyst

INTRODUCTION

Cerebral hydatid represents <2% of all intracranial space-occupying lesions (17), with the most common site being the supratentorial parenchyma of the MCA territory. Uncommon sites include cerebral ventricle, cavernous sinus (15), parasellar region (4), basal ganglia (10,16), brainstem (18,25) and other extradural locations described in various case reports. Overall, 37 cases of intraventricular hydatid cysts have been reported in the literature (21). Primary solitary intraventricular cysts are the most common type of ventricular hydatid disease. All the reported cases are purely intraventricular or partly parenchymal with an intraventricular spread. Contiguous spread from the extradural location, dural breach and intraventricular migration have not been reported in any of the cases. Here, we present a unique case in which an extracerebral hydatid cyst in the sub-temporal location breached the temporal basal dura and exhibited a contiguous intraventricular spread to the temporal horn as well as the lateral ventricle proper. This case highlights the ability of the hydatid cyst to breach the dura mater, a peculiar phenomenon that has so far not been described in the literature.

CASE REPORT

A 10-year-old girl presented with progressive headache and repeated vomiting to our hospital. Considering the symptoms of elevated intracranial tension, a computed tomography (CT) scan of the head was ordered. CT showed multiple cystic lesions in the right lateral ventricle and right temporal and sub-temporal locations with a mass effect and midline shift to the left. Magnetic resonance imaging (MRI) of the brain was also performed, which indicated multiple cystic lesions in the right temporal area. The lesions spread contiguously to the temporal horn and the main body of the lateral ventricle (Figures 1, 2). A diagnosis of intraventricular hydatid cysts was made, and surgical excision was planned. Chest and abdominal scanning did not show any evidence of systemic disease. Laboratory investigations were also within normal limits. Temporal craniotomy was performed, and multiple hydatid cysts were identified in the extradural sub-temporal location, which lifted the temporal basal dura and eroded the surrounding bone. From that site, continuity of the hydatid cysts was noted to the intraventricular location via a

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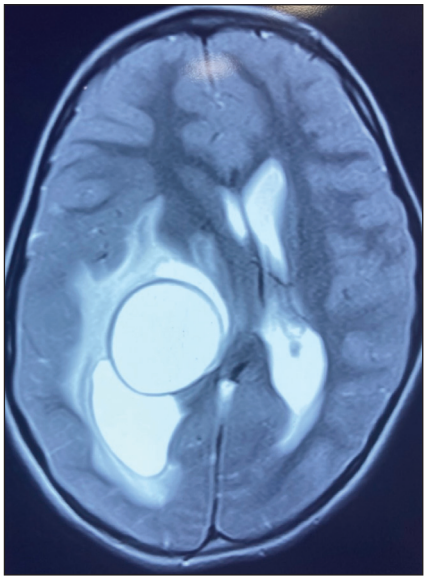

Figure 1: Axial T2W preoperative MRI image showing intraventricular hydatid cyst with edema and midline shift to the left.

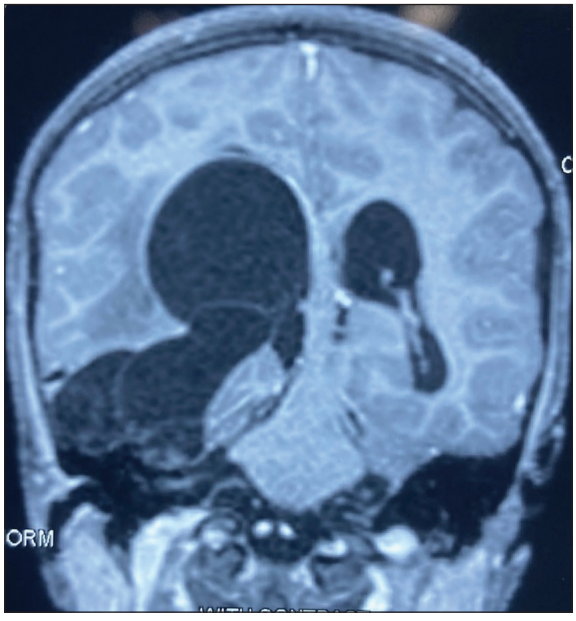

Figure 2: Sagittal T1W preoperative MRI image showing multiple hydatid cyst lifting temporal dura and having a contiguous spread to intraventricular location.

dural breach. All intraventricular cysts were removed via the dural communication itself without any additional exposure. The post-excision wound was thoroughly washed with 3% hypertonic saline and closed. Post-operative CT confirmed the complete excision of all cystic lesions and relief from the mass effect (Figure 3). Histopathological examination established the diagnosis of hydatid cysts (Figures 4, 5).

Written informed consent was obtained from the individual (and/or legal representative) for the publication of the case.

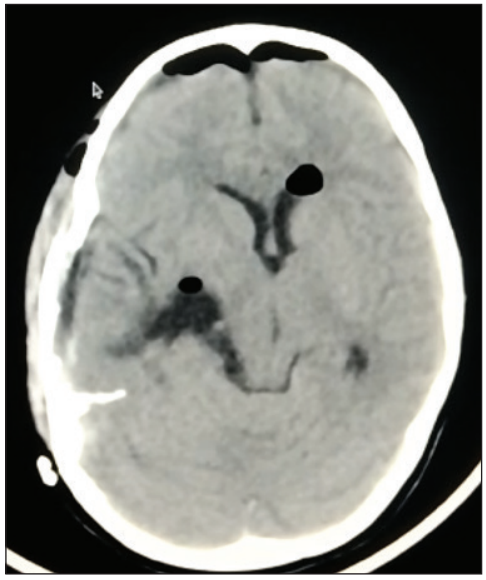

Figure 3: Post- operative CT scan revealed complete excision of hydatid cyst with pneumo-ventricle and relief in mass effect as compared to preoperative images.

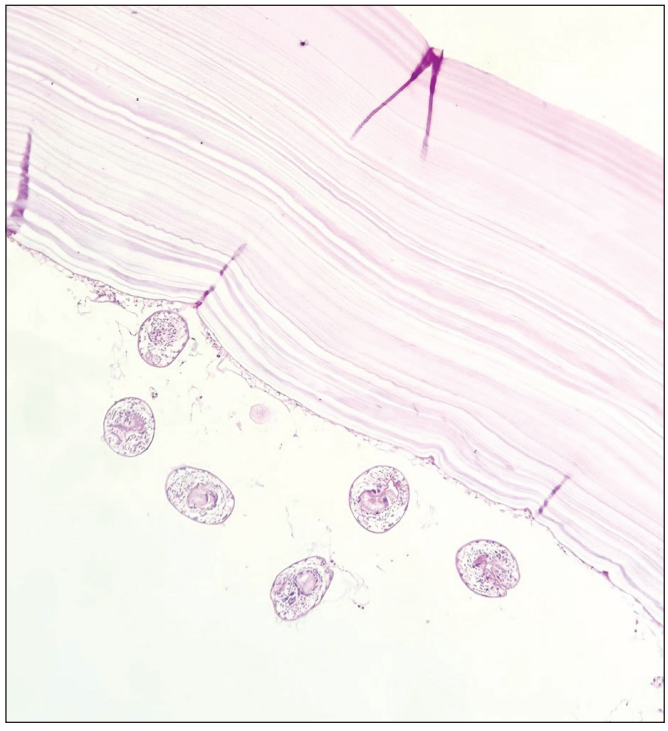

Figure 4: Picture showing acellular laminated membrane with protoscolices (H&E, 40x).

DISCUSSION

Hydatid disease is caused by ingesting the eggs of *Echinococcus granulosus* (17). The parasitic eggs form an oncosphere in the intestine and spread via the hematogenous route to different organs. The most involved organ is the lung (75%), followed by the liver (15%). Intracerebral involvement

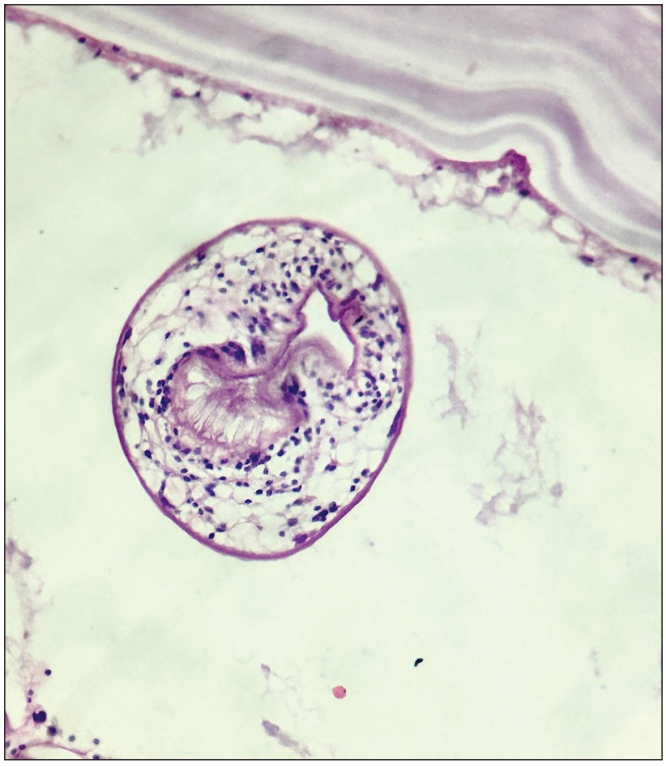

Figure 5: Protoscolex of echinococcus granulosus with multiple hooklets and suckers (H&E, 400x).

is seen in only 2% of the cases (3,17,19). Hydatid cysts are usually solitary and are found mostly in the paediatric population within the MCA territory (5). Other rare sites of involvement are the intraventricular and cisternal regions and the brainstem. An extensive literature search revealed 37 cases of intraventricular hydatid cysts (21). In all these cases, the source of the intraventricular hydatid was an embolic spread from the choroid plexus (2,8), or a spread from the parenchymal location (9). Contiguous spread from the extracerebral to the intracerebral location has not been described in any of the cases. This phenomenon of the hydatid cyst breaching the dura matter makes our case unique.

The symptoms depend on the site and size of the cysts and their mass effect. The usual symptoms are headache, nausea and vomiting and papilledema. Other focal symptoms can be present depending on the location of the cyst. Cerebral hydatid cysts can be primary or secondary based on the involvement of other body organs or the lack of it. Primary hydatid cysts result from the infestation of larvae into the brain parenchyma; they are fertile and contain scolices. Their rupture can lead to the dissemination of the hydatid cysts, leading to the formation of multiple daughter cysts (11).

Hydatid cysts are well circumscribed cystic lesions without much contrast enhancement and no perilesional oedema (7,14,24). The differential diagnosis includes arachnoid cysts, dermoid–epidermoid cysts, cerebral abscesses and porencephalic cysts (12). The rupture of intraventricular hydatid cysts can give rise to a water lily or camalote sign on MRI (20).

Surgical excision is the treatment of choice for intracerebral hydatid cysts (22). All attempts must be made to remove the cyst intact; however, the cyst wall is thin and fragile, and inadvertent rupture can occur during the surgery. In these circumstances, all contents must be sucked out and a thorough wash should be given with hypertonic saline to prevent spread via the cerebrospinal fluid (1). The Dowling–Orlando technique involves the use of hydrodissection to separate the cyst wall from the brain parenchyma (6). Saline infusion through fine-bore catheters and lowering the head aid in cyst excision. Aspiration and excision can be attempted at other sites in which this technique is not feasible. Medical management with Albendazole is possible, but its results are unsatisfactory. However, this approach may help in the sterilization of the cyst and prevent anaphylaxis in case of cyst rupture (13,23).

CONCLUSION

The hydatid cysts have the potential to breach the dura mater. Our paper highlights this potential and their intradural migration after breaching dura.

Declarations

Funding: Study was self funded.

Availability of data and materials: The datasets generated and/or analyzed during the current study are available from the corresponding author by reasonable request.

Disclosure: The author declares no conflict of interest.

AUTHORSHIP CONTRIBUTION

Study conception and design: RR, AK
Data collection: RR, AK
Analysis and interpretation of results: RR, AK
Draft manuscript preparation: RR, AK
Critical revision of the article: RR, AK
Other (study supervision, fundings, materials, etc...): RR, AK
All authors (RR, AK) reviewed the results and approved the final version of the manuscript.

REFERENCES

1. Altibi AM, Qarajeh RA, Belsuzarri TA, Maani W, Kanaan TMA: Primary cerebral echinococcosis in a child: Case report-surgical technique, technical pitfalls, and video atlas. Surg Neurol Int 7:893-898, 2016. https://doi.org/10.4103/2152-7806.194512
2. Aydin MD, Ozkan U, Altinors N: Quadruplets hydatid cysts in brain ventricles: A case report. Clin Neurol Neurosurg 104:300-302, 2002. https://doi.org/10.1016/S0303-8467(02)00013-6
3. Beggs I: The radiology of hydatid disease. AJR Am J Roentgenol 145:639-648, 1985. https://doi.org/10.2214/ajr.145.3.639
4. Behari S, Banerji D, Phadke RV, Shukla S, Krishnani N, Chhabra DK: Multiple infected extradural parasellar hydatid cysts. Surg Neurol 48:53-57 1997. https://doi.org/10.1016/S0090-3019(97)85702-3

5. Bükte Y, Kemaloglu S, Nazaroglu H, Ozkan U, Ceviz A, Simsek M: Cerebral hydatid disease: CT and MR imaging findings. Swiss Med Wkly 134:459-467, 2004. https://doi.org/10.57187/smw.2004.10711
6. Carrea R, Dowling E, Guevara JA: Surgical treatment of hydatid cysts of the central nervous system in the pediatric age (Dowling's technique). Pediatr Neurosurg 1:4-21, 1975. https://doi.org/10.1159/000119553
7. Coates R, Sinner WV, Rahm B: MR imaging of an intracerebral hydatid cyst. Am J Neuroradiol 11:1249-1250, 1990
8. Copley IB, Fripp PJ, Erasmus AM, Otto DDV: Unusual presentations of cerebral hydatid disease in children. Br J Neurosurg 6:203-210, 1992. https://doi.org/10.3109/02688699209002928
9. Eckert J, Deplazes P: Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern. Clin Microbiol Rev 17:107-135, 2004. https://doi.org/10.1128/CMR.17.1.107-135.2004
10. Ersahin Y, Mutluer S, Demirtas E, Yurtseven T: A case of thalamic hydatid cyst. Clin Neurol Neurosurg 97:321-323, 1995. https://doi.org/10.1016/0303-8467(95)00052-L
11. Evliyaoglu C, Keskil S: Possible spontaneous "birth" of a hydatid cyst into the lateral ventricle. Childs Nerv Syst 21:425-428, 2005. https://doi.org/10.1007/s00381-004-1042-z
12. Guzel A, Tatli M, Maciaczyk J, Altinors N: Primary cerebral intraventricular hydatid cyst: A case report and review of the literature. J Child Neurol 23:585-588, 2008. https://doi.org/10.1177/0883073807309791
13. Horton R: Albendazole in treatment of human cystic echinococcosis: 12 years of experience. Acta Trop 64:79-93, 1997. https://doi.org/10.1016/S0001-706X(96)00640-7
14. Karak P, Mittal M, Bhatia S, Mukhopadhyay S, Berry M: Isolated cerebral hydatid cyst with pathognomonic CT sign. Neuroradiology 34:9-10, 1992. https://doi.org/10.1007/BF00588424
15. Kireşi DA, Karabacakoğlu A, Odev K, Karaköse S: Pictorial review: Uncommon locations of hydatid cysts. Acta Radiol 44:622-636, 2003. https://doi.org/10.1046/j.1600-0455.2003.00135.x
16. Kurtsoy A, Öktem IS, Koç RK, Akdemir H, Menkü A, Tucer B: Successful surgical treatment of a thalamic hydatid cyst with contralateral transcallosal approach. Pediatr Neurosurg 31:96-99, 1999. https://doi.org/10.1159/000028840
17. Miabi Z, Hashemi H, Ghafarpour M, Ghelichnia H: Clinicoradiological findings and treatment outcome in patients with intracranial hydatid cyst. Acta Medica Iranica 43:359-364, 2005
18. Muthusubramanian V, Pande A, Vasudevan MC, Ravi R: Surgical management of brainstem hydatid cyst-an unusual site. Surg Neurol 71:103-106, 2009. https://doi.org/10.1016/j.surneu.2007.06.077
19. Padayachy LC, Dattatraya M: Hydatid disease (Echinococcus) of the central nervous system. Childs Nerv Syst 34:1967-1971, 2018. https://doi.org/10.1007/s00381-018-3883-x
20. Sadashiva N, Shukla D, Devi BI: Rupture of intraventricular hydatid cyst: Camalote sign. BI World Neurosurg 110:115-116, 2018. https://doi.org/10.1016/j.wneu.2017.11.019
21. Samadian M, Mousavinejad SA, Jabbari A, Tavassol HH, Karimi P, Almagro K, Rezaei O, Borghei-Razavi H: Third ventricle hydatid cyst: A rare case report and review of the literature. Clin Neurol Neurosurg 198:106218, 2020. https://doi.org/10.1016/j.clineuro.2020.106218
22. Senapati SB, Parida DK, Pattajoshi A, Gouda AK, Patnaik A: Primary hydatid cyst of brain: Two cases report. Asian J Neurosurg 10:175, 2015. https://doi.org/10.4103/1793-5482.152109
23. Singounas E, Leventis A, Sakas D, Hadley D, Lampadarios D, Karvounis P: Successful treatment of intracerebral hydatid cysts with albendazole: Case report and review of the literature. Neurosurgery 31:571-574, 1992. https://doi.org/10.1097/00006123-199209000-00022
24. Tuzun M, Altinors N, Arda IS, Hekimoglu B: Cerebral hydatid disease: CT and MR findings. Clin Imaging 26:353-357, 2002. https://doi.org/10.1016/S0899-7071(02)00449-7
25. Yilmazlar S, Aksoy K: Approach via the floor of the fourth ventricle for hydatid cyst of the pons. Pediatr Neurosurg 31:326-329, 1999. https://doi.org/10.1159/000028884