

CASE REPORT

Primary Intracranial Hydatid Cyst: A Rare Parasitic Infection

Shruti Chendkale¹, Aishwarya Lachake², Neha Pichad³, Milind S.Tullu⁴**HOW TO CITE THIS ARTICLE:**

Shruti Chendkale, Aishwarya Lachake, Neha Pichad, et al. Primary Intracranial Hydatid Cyst: A Rare Parasitic Infection. Indian J Trauma Emerg Pediatr. 2025; 17(2) 57-60.

ABSTRACT

Hydatid cyst is a parasitic infection caused by *Echinococcus granulosus*. Intracranial hydatid cysts are rare and remain asymptomatic for prolonged periods. Complete & intact excision of cyst (to prevent anaphylactic shock) is mainstay of treatment. Pre & post-operative albendazole plays an important role along with oral steroids. We report an eleven-years-old girl presenting with headache, vomiting and weakness of right upper & lower limb. MRI brain revealed a well-defined cystic lesion in left fronto parietal lobe with significant midline shift (hydatid cyst). Patient was treated with albendazole and oral steroids. Complete excision of the cyst was performed. Albendazole was continued post-operatively for 3 months.

Key Message: Intracranial hydatid cysts are extremely rare. Complete excision of cyst (without rupture) with perioperative albendazole and oral steroids ensures complete recovery and prevents recurrence.

KEYWORDS

• Albendazole • Cyst • *Echinococcus granulosus* • Excision • Hydatid • MRI brain • Steroids

INTRODUCTION

Hydatid cyst, also called as Cystic echinococcosis, is a parasitic infection caused by tapeworm, *Echinococcus granulosus*.¹ Dogs are the definitive host & mammals (sheep/

goat/cattle) are intermediate hosts.^{1,2} Humans are accidental intermediate hosts, infected by ingestion of food/water which is contaminated with dog-feces containing ova of the parasite or by direct contact with dogs.²

AUTHOR'S AFFILIATION:

¹ Junior Resident-III, Department of Pediatrics, Seth G.S. Medical College & KEM Hospital, Parel, Mumbai, India.

² Assistant Professor, Department of Pediatrics, Seth G.S. Medical College & KEM Hospital, Parel, Mumbai, India.

³ Assistant Professor, Department of Pediatrics, Seth G.S. Medical College & KEM Hospital, Parel, Mumbai, India.

⁴ Professor, Department of Pediatrics, Seth G.S. Medical College & KEM Hospital, Parel, Mumbai, India.

CORRESPONDING AUTHOR:

Milind S. Tullu, Professor, Department of Pediatrics, Seth G.S. Medical College & KEM Hospital, Parel, Mumbai, India.

E-mail: milindtullu@yahoo.com

➤ Received: 28-09-2025 ➤ Accepted: 19-12-2025



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CASE REPORT/CASE DETAILS

An eleven-years-old girl, without significant past medical illnesses, presented with progressive intermittent headache (mainly frontal) since past 7 months, weakness in right upper & right lower limb since 7 days and vomiting since 4 days. There was absence of exposure to domestic animals. On examination, she was conscious, oriented and had right-sided hemiparesis (power 4/5) with bilateral papilledema. MRI Brain showed T2-hyperintense, T1- hypointense, & FLAIR-hypointense, cystic lesion (7.6*7.1*6.9 cm) in left frontoparietal lobe with enhancing walls with perilesional edema & mass effect with midline shift of 8.7 mm towards the right, without diffusion restriction, suggesting solitary hydatid cyst [Figure 1]. USG abdomen & complete ophthalmic examination ruled out

other systemic involvement by the parasite. The patient was started on albendazole (15 mg/kg/day), levetiracetam & prednisolone (2 mg/kg/day). Left parietal craniotomy & excision of the cyst (in toto, without rupture by irrigating saline between cyst wall and brain interface) was done on day 3 of hospital admission [Figure 2]. Following surgery, prednisolone was continued for 3 weeks and albendazole for 3 months. Post-operative MRI Brain (done 8 days after surgery) showed absence of any residual cyst. Post-operatively, the patient showed marked symptomatic improvement & was discharged after 15 days of hospital stay. Histopathology report revealed fragments of laminated cyst wall & germinal layer with cuboidal lining, confirming the diagnosis of hydatid cyst [Figure 3].



Figure 1: MRI showing T1-hypointense, T2-hyperintense & FLAIR-hypointense cystic lesion (7.6*7.1*6.9 cm), in left frontoparietal lobe with enhancing walls with perilesional edema & mass effect with midline shift of 8.7 mm towards the right without diffusion restriction, suggesting solitary hydatid cyst (T1W Axial, T2W Axial & Flair images from left to right)



Figure 2: Excised hydatid cyst wall (white gelatinous membrane with hydatid sand)

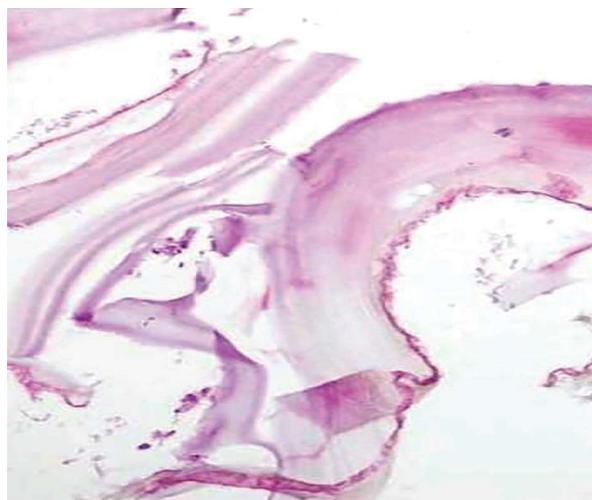


Figure 3: H & E (x 100) showing fragments of laminated cyst wall & germinal layer with cuboidal lining

DISCUSSION

Hydatid cyst is a parasitic infection caused by infestation of tapeworm *Echinococcus granulosus*. Hydatid cyst is more prevalent in China, India, Middle East, Eastern Europe, New Zealand, South America & Mediterranean countries.^{1,2} In India, hydatid cyst is common in Andhra Pradesh & Tamil Nadu.³ Common sites of hydatid cyst are liver (50-70%), lungs (40%), spleen, kidney, heart, bones & brain.² Intracranial cyst is extremely rare (only 1%-2% of total).^{1,2,4} Most common site of intracranial hydatid cysts is supratentorial & they are located in the middle cerebral artery territory with the parietal lobe being the most common site; infratentorial cysts are rare.^{5,6,7} Intracranial hydatid cysts are of two types^{2,5,6}

- A. Primary-occurring due to direct infestation of brain by parasite without involvement of other organs.^{2,5} These cysts are fertile & have pericyst with brood capsule & scolices^{2,6}
- B. Secondary -occurring due to spontaneous/traumatic rupture of primary cyst present elsewhere.^{2,5} These are infertile as they lack brood capsule & scolices^{2,6}

CT & MRI brain both are useful for diagnosing the intracranial hydatid cyst.^{1,3,5} Hydatid cyst is solitary & multiple cysts are rare.¹ MRI brain reveals a well-defined spherical cystic lesion which is isodense to CSF with T1 hypointense, T2 hyperintense & FLAIR hypointense signal, without any post-contrast enhancement.^{4,5,8} Daughter cysts are considered pathognomonic of hydatid cyst but are rarely seen.¹ Calcification of wall is extremely rare (less than 1% of cases).^{3,4,8} Mass effect, with compression of midline structures is common.¹ Surrounding edema & contrast enhancement are generally not present in uncomplicated cases.⁴ Specific antigen detection by serology has very low sensitivity.^{4,5}

Management of intracranial hydatid cyst is mainly surgical.^{1,2,3,8} However, antihelminthic agent like albendazole (10-15 mg/kg/day) is to be given preoperatively to sterilize the cyst as it decreases the tension in the cyst wall & thus reduces the risk of anaphylaxis & recurrence.^{1,2,6,9,10} It is recommended to

give albendazole for 3 months following the surgery.^{1,6,9} "Dowling-Orlando technique" is the most commonly used surgical technique for hydatid cyst excision.^{1,5} The most common complication during surgery is the rupture of the cyst into the subarachnoid space which leads to widespread dissemination & fatal anaphylactic response or severe meningitis.¹

CONCLUSION

Intracranial hydatid cysts are extremely rare. Successful treatment requires high index of suspicion & early diagnosis by neuroimaging (MRI). Complete excision of cyst without rupture with perioperative albendazole & oral steroids ensures complete recovery and prevention of recurrence.

Acknowledgement:

The authors wish to thank Dr. Sangeeta Ravat [Dean, Seth G.S. Medical College & KEM Hospital] for granting permission to publish this manuscript.

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