Retrospective Analysis of Hydatid Cyst Patients and Incidence of CNS Involvement in Southern Rajasthan

Sachidanand Gautam[1], Baibhav Kumar[2], Bhawana Gautam[3], Gaurav Gupta[4], Banesh Jain[5]

[1,2,4,5] Department of Neurosurgery, Government Medical College, Kota, Rajasthan, India

[3] Department of Gynaecology and Obstetrics, Sudha Medical College, Kota, Rajasthan, India

Date of Submission:12th April 2025 Date of Acceptance: 30th November 2025 Date of Publication: 15th December 2025

Abstract

Introduction: Echinococcosis also known as hydatid disease is an endemic zoonotic disease with an estimate of 2,00,000 new cases per year worldwide. Its primary definitive host is dog and man being an accidental intermediate host. The most common organ affected is liver, brain, and spine. Surgery is the mainstay of treatment and medical management is reserved for selected cases. Our objective was to retrospectively evaluate the prevalence of craniospinal hydatid cyst disease in southern Rajasthan.

Materials and method: A retrospective analysis of all cases of craniospinal hydatid disease managed at our department was done from 2013 to 2021 and data was analysed.

Results: A total number of eight cases were reported with an incidence of 1.8% of all craniospinal space-occupying lesions during the study period with a male to female ratio of 3:1, mean age of presentation 18.5 years, four out of eight patients were in paediatrics age group. All cases were managed surgically with preoperative rupture in one case and recurrence in two cases. Albendazole was given to cases only with rupture or recurrence.

Conclusions: Craniospinal hydatid disease should be suspected in all non-enhancing cystic brain lesions especially in endemic regions. In all patients, surgical excision should be done preferably with medical management reserved for inaccessible lesions, unfit patients, rupture and recurrent cases only. The study concludes that primary surgery with gross total excision with no or minimal spillage of cyst content intraoperatively has good results with recurrence rate of only 12.5%.

Keywords: Craniospinal hydatid, Echinococcosis, Albendazole, Craniotomy

Introduction

Human infection with the larval form of two species of Echinococcus parasite, i.e., E. granulosus and E. multilocularis is known as 'Hydatidosis'. Hydatid - Greek word for `watery cyst' disease is a rare but significant parasitic disease in endemic areas. It is most frequently seen in the Middle East, South America, New Zealand, and Mediterranean countries [1]. In India it is known to be endemic in Andhra Pradesh and Tamil Nadu, provinces in southern India [5] and high cases have been reported in south eastern parts of Rajasthan in last few years [7]. The lack of accurate case reporting and genotyping currently prevents any precise mapping of the true epidemiologic picture. Cystic echinococcosis (CE) disease results from being infected with the larval stage of Echinococcus granulosus, a tiny tapeworm (two to seven millimetres in length) found in dogs (definitive host), sheep, cattle, goats, foxes, and pigs, amongst other intermediate hosts. The adult Echinococcus multilocularis (1.2—4.5 mm long) resides in small intestine of definitive host. Humans are aberrant intermediate host and become infected by ingesting eggs. Oncospheres are released in the intestine and cysts develop within the liver. Metastasis or dissemination to other organs (e.g., lungs, brain, heart, bone) may occur if protoscolices are released from cysts, sometimes called "secondary echinococcosis." 60% to 70% of hydatid cysts are located in the liver and 10% to 15% are located in the lungs. Brain involvement occurs in 1-2% of all Echinococcus granulosus infection. Cerebral hydatid cysts are usually supratentorial, whereas infratentorial lesions are quite rare. Cerebral hydatid disease is more common in the paediatric population and young adults with approximate 50-70% incidence rate. Spinal hydatid cysts account for 1% of all cases of hydatid disease [19,14,11].

An osseous location is seen 0.5% to 2% and approximately half of them are located in vertebrae. While 50% of the vertebral involvement is seen in the thoracic area and 20% is in the lumbar area. Sacral and pelvic involvement is rare [6,10,2]. The disease usually spread to spine by direct extension from a pulmonary,

Access this article online

Website: https://www.nepjol.info/index.php/NJN

DOI: https://doi.org/10.3126/njn.v22i24.77591

HOW TO CITE
Sgautam, sachidanand, Kumar, B., Gautam, B., Gupta, G., & Jain, B. Retrospective Analysis of Hydatid Cyst Patients and Incidence of CNS Involvement in Southern Rajasthan . NJNS. 2025;22(4)22-27

Address for correspondence:
Dr. Sachidanand Gautam,
Department of Neurosurgery, Government Medical College & Affiliated Hospitals, MBS Hospital, Kota-324001, Rajasthan, India
Email:drsachidanandkgautam@gmail.com

ISSN: 1813-1948 (Print), 1813-1956 (Online)

abdominal, or pelvic infestation and most commonly affect the dorsal region of spine [2,12,16]. Usually, the cerebral cyst is solitary and often seen in the parietal lobe [4] while spinal cysts are mostly multiple and epidural in location. In any endemic area of HD, disease should be considered in any patient presenting with cysts or cystic masses in any organ of the body with unusual site or presentation. The aim of this study was to report cases of hydatid cyst that has been confirmed by histopathology in the past eight years (2013-2021) concerning the rare occurrence of cerebral, spinal hydatid cysts with their clinicopathologic findings.

Materials and Methods

A retrospective study was done and data was collected from Government College Kota. From 2013 to 2021, a total of 62,892 histopathological examinations were performed, out of which 498 were total histopathological confirmed cases of hydatid cyst and a total of eight CNS cases were found, seven from the brain and one in the spinal cord. The total incidence was 1.96%.

Table 1: Comparison of number of histopathological examination (HPE)

Total no of HPE	No. of hydatid cyst	No. of Hydatid cases in CNS
62,892	498	8

Observation and Results:

A total number of cases were studied in terms of different demographic properties. When we compared the number of cases in males and females in different age groups, following inference was drawn.

Table 2: For total number of cases hydatid cyst.

AGE GROUP	MALE	FEMALE
< 20 years	74	27
21-40 years	114	72
41-60 years	50	38
>60 years	25	8
TOTAL CASES	263	145

It was observed that most of the patients were young adults (45.58%) in the age group of 21-40 years and Male: Female ratio was found to be 1.8:1.

Table 3: For Craniospinal cases.

AGE GROUPS	MALE	FEMALE
< 20 years	3	1
21-40 years	2	1
41-60 years	1	0
>60 years	0	0
TOTAL CASES	6	2

Whereas the patients with CNS disease was found to be more commonly affecting young males (50% of cases) and with Male: Female ratio of 3:1.

Table 4: Case details of patients with craniospinal hydatid cyst.

AGE & SEX	PRESEN TATION & DURATI ON OF SYMPTOMS	LOCATION AND NUMBER	MANAG EMENT	RECUR RENCE	INTRAOP ERATIVE RUPTURE	ALBEND AZOLE	RISK FACTORS	FOL LOW UP
12 year/ F	Headache, seizures, right hemiparesis sis, duration six months	Left temporo-parietal, single	Surgery	No	No	No	H/o contact to pets	Lost in follow up
14 year/ M	Headache, vomiting, left hemiparesis sis, three months	Right temporo-parietal, single	Surgery	No	No	No	No	Four years
5 year/ M	Headache, vomiting, left hemiparesis sis, three months	Right temporo-parietal, single	Surgery	No	No	No	H/o contacts with pets	Lost in follow up and presents with recurrence after three years
30 year/ M	Headache, vertigo, tinnitus two months	Right CP angle, single	Surgery	No	No	Yes	No	Two months
8 year/ M	Headache, vertigo, tinnitus two months	Right CP angle, single	Surgery	Yes	No	Yes (After recurrence e)	No	Eight years
60 year/ M	Headache, right hemiparesis five months	Left parietal, single	Surgery	No	No	No	No	One year
23 year/ F	Lower backache, paraparesis is, urinary incontinence 3 months	Right paraspinal and intraspinal, multiple	Surgery	No	No	Yes	No	Two month
33 year/ M	Headache , vomiting, reduced vision in right eye 3 months	Right mastoid region, single	Surgery	NO	No	No	No	Lost in follow w up and presents with recurrence after 3 years

The sign and symptoms of the disease varied according to site of presentation. Following results were found when we observed the frequency of symptoms.

Table 5: frequency of sign and symptoms of brain and spinal cases.

Sign & Symptoms of brain	Percentage	Signs & Symptoms of spine	Percentage
Headache	100%	Urinary incontinence	100%
Vomiting & hemiparesis	57.1%	Backache	100%
Seizures	28.6%		
Vertigo & tinnitus	14.3%		
Reduced visual acuity	14.3%		

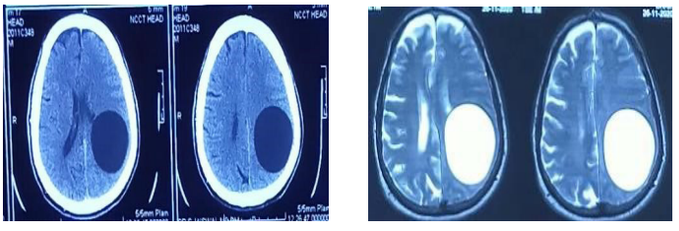

Figure 1[a]: Preoperative scans showing the location of intracranial hydatid cyst

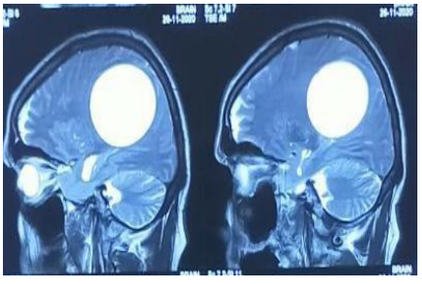

Figure 1[b]: Preoperative scans showing the location of intracranial hydatid cyst

Figure 1[c]: Preoperative scans showing multiple intracranial hydatid cysts

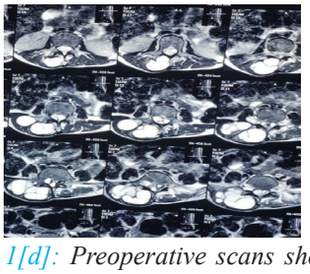

Figure 1[d]: Preoperative scans showing multiple intraspinal hydatid cysts

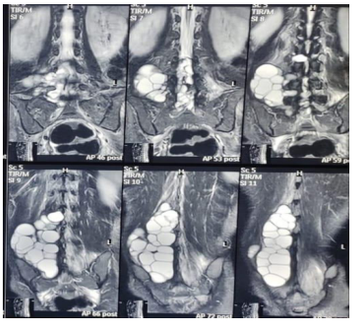

Figure 1[e]: Preoperative scans showing multiple paraspinal hydatid cysts

Figure 2: Delivery of intracranial hydatid cyst using Dowling's technique

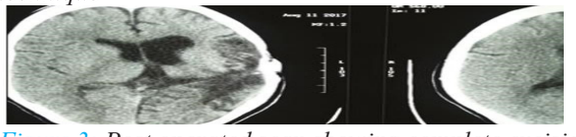

Figure 3: Post operated scan showing complete excision of cyst

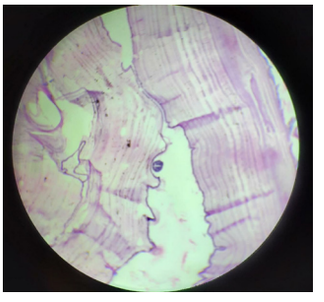

Figure 4[a]: Histopathological microphotograph [40X] showing laminated ectocyst, scolex and inflammatory infiltrate

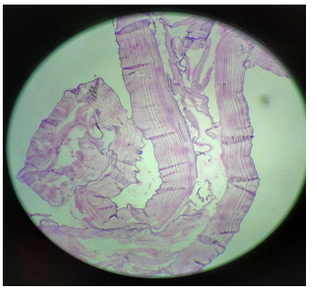

Figure 4[b] Histopathological microphotograph [40X] showing laminated ectocyst, scolex and inflammatory infiltrate

Discussion and review of literature:

In Indian set up we have found three case series [9,21,22] with number of different cases that have been compared below.

Table 6: Comparison of different studies.

	Tanki et.al	Gupta et. al	S.N Gautam et. al	S. Shukla et.al	Current series
Number of cases	9	5	6	3	8
Mean age of presentation	11.5 years	13.4 years	21.2 years	9 years	18.5 years
Paediatric patients	9/9 [100%]	4/5 (80%)	4/6 (66.66%)	2/3 (66.66%)	4/8 (50%)
Duration of symptoms	One month to two years	One month to two years	One month to six months	Fifteen days to four months	Two to six months
Male: female	5:4	3:2	5:1	2:1	3:1
RISK FACTORS 1.Contacts to pets Rural location	7/9 8/9	2/5 3/5	2/6 6/6	NA NA	2/8 8/8
Symptoms	Seizures (m/c), hemiparesis, Vomiting, headache	Hemiparesis [Most common], Seizures	Headache (Most common), Hemiparesis, Vomiting, Seizures	Headache, vomiting, seizures, decreased vision, backache, urine retention	Headache, vomiting, seizures, decreased vision, backache, urinary incontinence
Location of cysts	Four parietal solitary cysts, Two frontal solitary, One parietooccipital solitary,	One patient each with frontal, lateral ventricle,	Two patients each with temporoparietal solitary cyst,	One temporoparietooccipital	Two patients each with Temporo-Parietal solitary cyst
	Two parietal multiple cysts	parietal. Two patients with multiple cysts in parietal and temporoparietal region	one with lateral ventricle, one parietal, one mastoid, one with multiple temporo-parietal cysts	solitary cyst, one withC6, C7 spinal canal multiple, one cauda equine below conus solitary cyst	one with lateral ventricle, one parietal, one mastoid, one with multiple temporo-parietal cysts, one with paraspinal & intraspinal multiple
Intraoperative rupture	Three cases	Two cases	One case	Nil	One case
Anaphylaxis following rupture	Nil	nil	Nil	Nil	Nil
Recurrence	Two cases, one year of surgery	Two cases; six months to one year after primary surgery	One case, six months following surgery	NA	Two cases, three years following surgery, one with six months of surgery
Albendazole	Everyone,10mg/kg for two months	To two patients following recurrence, 10 mg/kg for one month	Two patients, one with rupture another with recurrence, 10mg/kg up to four cycles	Everyone, 10mg/kg for three months	Three patients, 10mg/kg up to four cycles
Follow up period	Six months to five years	Six months to eight years	Six months to seven years	NA	one month to eight years

Hydatidosis of the spine was first described by Churrier in 1807 [18] Guesnar reported first case of cerebral hydatid [5]. Intracranial hydatid forms about 1-2% of all intracranial space-occupying lesions [14].

Spinal involvement in hydatid disease is the result of the portovertebral shunt and the centre of the vertebral body is first [15] site to be involved. Multiple vertebral involvement is unusual, owing to the relative resistance for invasion of the disc space. It usually starts in the vertebral body and grows slowly because of the resistant nature of bone. When the bone is breached by cysts and extradural space is violated, the neurologic deficit with unremitting pain ensues. A study has also concluded that a possible mechanism of spreading the cysts to lumbosacral spinal intradural space is through cerebrospinal fluid flow, after entering the thoracal spinal level from the primary pulmonary hydatid disease via transforaminal due to local invasion [9].

On CT head, there is a hypodense non-contrast enhancing oval homogenous cystic mass lesion with thin walls and smooth margins with pressure effect on surrounding brain parenchyma as per the size of the lesion with no surrounding oedema. The MRI with its superior soft-tissue resolution is the most sensitive diagnostic method as well as the method of choice for the determination of the extent of the disease. A study by Berk et al stated that MRI of the lesions has a unique appearance, a sausage-like appearance with two dome-shaped ends, thin and regular walls and with no septation or debris in the lumen. The lesions are occasionally spherical [3]. In T1W images of the cyst, wall appears iso- or slightly more hypo-intense than the cyst content and enhance slightly after contrast injection. T2W images demonstrate a low-intensity rim which correlates to the pathological findings of reactive fibrosis and degeneration surrounding the parasitic membrane. The spinal hydatid can be classified according to Dew/Braithwaite and Lees classification.

Table 7: Dew/Braithwaite and Lees classification.

Type 1	Intramedullary
Type 2	Intradural, extramedullary
Type 3	Extradural, intraspinal
Type 4	Vertebral
Type 5	Paravertebral

In our spinal case, a 23-year female who had multiple extradural intraspinal as well as multiple paravertebral cysts, presented to us with symptoms of lower backache, paraparesis, urinary incontinence for three months. It is a mixed presentation of both type three and type five of this classification. Surgical removal is the first and most effective option for treating spinal canal hydatid cysts. The preferred technique includes the Dowling technique later modified by Arana Iniguez and San Julian. But radical excision is almost impossible in hydatid disease of the spine because of absence of distinct anatomic planes and the existence of neural structures, hence has high local reoccurrence rate. A course of Albendazole (800 mg daily in two divided doses) is continued for one to six months (usually three months). Albendazole is preferred over Mebendazole. Lam et al reported an inoperable case of recurrent spinal hydatidosis treated with a combination of Albendazole plus Praziquantel survived for 34 years [13].

Conclusions:

With this study, we concluded that total incidence of CNS hydatid disease in south-eastern Rajasthan is found 1.8% that is more than the previously calculated incidence of 1% [20,11,17]. This study had the advantage of long term follow up that has been conducted so far for the CNS cases. The study also concluded that a good primary surgery with gross total excision of cyst with no or minimal spillage of cyst contents intraoperatively has goodresults with recurrence in only 12.5% of cases.

Consent: Proper consent has been taken from legal guardians of patients to use their data for academic publication with assurance of non-disclosure of identity to the best of the extent.

References

1. Adilay U, Tuğcu B, Güneş M, et al. Cauda equina syndrome caused by primary lumbosacral and pelvic hydatid cyst: case report. Minim Invasive Neurosurg. 2007;50: 292-5.DOI:10.1055/s-2007-97382, PMID: 18058646.
2. Bavbek M, İnci S, Tahta K, et al. Primary multiple spinal extradural hydatid cysts: case report and review of the literature. Paraplegia. 1992; 30:517-9. Erratum in: Paraplegia. 1992;30: 755.DOI:10.1038/sc.1992.108, PMID: 1508568.
3. Berk CE, Çiftçi C, Erdoğan A. MRI in primary intraspinal extradural hydatid disease: case report. Neuroradiology. 1998; 40:390-2.
4. Boles DM. Cerebral echinococcosis. Surg Neurol. 1981; 16:2802.
5. Dharker SR, Vikram M. Hydatid disease. In: Ramamurthi B, Tandon PN, editors. Textbook of Neurosurgery. 3rd ed. New Delhi: Jaypee Brothers Medical Publishers; 2012. p. 794-8.
6. Fahl M, Haddad FS, Huballah M, et al. Magnetic resonance imaging in intradural and extradural spinal echinococcosis. Clin Imaging. 1994; 18:179-83.
7. Gautam S, Sharma A. Intracranial hydatid cyst: report of three cases in North-West India. J Pediatr Neurosci. 2018;13(1):91-5. DOI: 10.4103/JPN.JPN_141_17
8. Güneçs M, Akdemir H, Tuğcu B, et al. Multiple intradural spinal hydatid disease: case report and review of literature. Spine (Phila Pa 1976). 2009;34(9): E346-50. PMID: 19531992, DOI: 10.1097/BRS.0b013e3181a01b0f
9. Gupta S, Desai K, Goel A. Intracranial hydatid cyst: report of five cases and review of literature. Neurol India. 1999; 47:214.
10. Içslekel S, Zileli M, Erçsahin Y. Intradural spinal hydatid cysts. Eur Spine J. 1998; 7:162-4. DOI: 10.1007/s005860050048
11. Kahilogullari G, Tuna H, Aydın Z, et al. Primary intradural extramedullary hydatid cyst. Am J Med Sci. 2005; 329:202-4. DOI: 10.1097/00000441-200504000-000
12. Karadereler S, Orakdögen M, Kiliç K, et al. Primary spinal extradural hydatid cyst in a child: case report and review of the literature. Eur Spine J. 2002; 11:500-3. DOI: 10.1007/s00586-002-0411-0, PMID: 12384760

13. Lam KS, Faraj A, Mulholland RC, Finch RG. Medical decompression of vertebral hydatidosis. Spine. 1997; 22:2050-5. DOI: 10.1097/00007632-199709010-00023, PMID: 9306538.
14. Luo K, Luo DH, Zhang TR, Wen H. Primary intracranial and spinal hydatidosis: retrospective study of 21 cases. Pathog Glob Health. 2013;107(2):47-51. DOI: 10.1179/2047773213Y.0000000072, PMID: 23683329
15. Özek MM. Complications of central nervous system hydatid disease. Pediatr Neurosurg. 1994; 20:84-91. DOI: 10.1159/000120770
16. Özer AF, Özek MM, Pamir MN, et al. Magnetic resonance imaging in the diagnosis of spinal hydatid cyst disease: case report. Paraplegia. 1993; 31:338-40. DOI: 10.1038/sc.1993.58
17. Pandey M, Chaudhari MP. Primary hydatid cyst of sacral spinal canal: case report. Neurosurgery. 1997; 40:407-9. PMID: 9033149
18. Rayport M, Wisoff HS, Ziman H. Vertebral echinococcosis. J Neurosurg. 1964; 21:647-59.
19. Reddy CR, Narasiah IL, Parvathi G, Rao MS. Epidemiology of hydatid disease in Kurnool. Indian J Med Res. 1968; 55:499-507.
20. Schnepper GD, Johnson WD. Recurrent spinal hydatidosis in North America: case report and review of the literature. Neurosurg Focus. 2004;17: E8. DOI: 10.3171/foc.2004.17.6.8, PMID: 15547582
21. Shukla S, Trivedi A, Singh K, Sharma V. Craniospinal hydatidosis: report of three cases. J Pediatr Neurosci. 2008; 3:146-9.
22. Tanki H, Singh H, Raswan US, et al. Pediatric intracranial hydatid cyst: case series with literature review. Pediatr Neurosurg. 2018; 19:1-6.