Original Research

Neurocysticercosis in Third Ventricle causing Brun's Syndrome Excision by Transcallosal approach in The Era of Endoscope

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Abstract:
Background: The most prevalent parasite disease of the central nervous system is neurocysticercosis, which is an infection of the central nervous system with the larval cysts of Taenia solium. In IVNCC hydrocephalus manifests as headache, nausea, vomiting, light headedness, and impaired vision. Acute blockage caused by changes in head position is sometimes linked to abrupt onset of symptoms also know as Bruns syndrome. We describe the third ventricular neurocysticercosis excision via open microscopic transcallosal approach en bloc removal of the cyst complex
Case Description: We describe the excision via transcallosal approach en bloc removal of the cyst complex in a 21-year-old female patient who presented with sudden onset of severe headaches, intermittent vomiting, increased headaches while changing head position CT imaging demonstrated moderately dilated lateral ventricles, significantly more on right side with transependymal CSF ooze and associated with midline shift 10.1mm s/o obstructive hydrocephalus. On MR scan T1 weighted images the lesion shows eccentric focus within, concerning for scolex.The patient was positioned in semi setting and underwent a microsurgical resection of the cyst without rupture through a transcallosal approach to the third ventricle.
Conclusion: With time, endoscopic procedures have improved and are now seen as a viable substitute for microneurosurgery. Still there is some limitations to endoscopy like difficulty in radical cyst excision which is attached to the roof of third ventricle. The surgeon operating on a neurocysticercosis should be aware of all the possible approaches to the lesion and should be able to choose the best route. Open surgical procedure in the era of endoscopy was used to successfully treat the patient, avoiding the need for a ventriculoperitoneal shunt.
Keywords:, Transcallosal approach Hydrocephalus, Neurocysticercosis , IVNCC ,Bruns syndrome

Introduction:-
When eggs from the mature tapeworm Taenia solium (T. solium) are consumed, it can lead to the parasitic infection known as cysticercosis (1). The most prevalent parasite disease of the central nervous system is neurocysticercosis, which is an infection of the central nervous system with the larval cysts of Taenia solium. Being the most common parasite infection in the brain, neurocysticercosis is a major contributor to epilepsy and can also induce inflammation of the subarachnoid space, intraventricular cysts obstructing the flow of cerebrospinal fluid, or mass effect from big cysts causing intracranial pressure.Many regions of the world, including parts of India and Latin America, have endemic cases of neurocysticercosis. These places are characterized by frequent contact between intermediate host animalpigs in particularas well humans and human feces, usually due to inadequate or insufficient sewage systems. As a result, the intermediate host animals are able to sustain a state of tapeworm infestation [14]. In IVNCC hydrocephalus manifests as headache, nausea, vomiting, light headedness, and impaired vision. Acute blockage caused by changes in head position is sometimes linked to abrupt onset of symptoms (Bruns syndrome)[13].
We describe the excision via transcallosal approach en bloc removal of the cyst complex in a 21-year-old female patient who presented with sudden onset of severe headaches, intermittent vomiting, increased headaches while changing head position

History and Examination:
A 21-year-old female patient who presented with sudden onset of severe headaches, intermittent vomiting, increased headaches while changing head position.She had previously been healthy and had no

significant medical history. Patient presented after experiencing headaches since twenty days. she came to hospital after following two episodes of emesis;

Imaging:

CT imaging demonstrated moderately dilated lateral ventricles, significantly more on right side with transependymal CSF ooze and associated with midline shift 10.1mm s/o obstructive hydrocephalus (Figure 1).

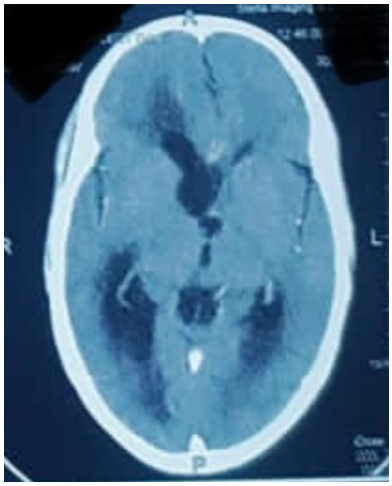

Fig.1: Non contrast CT imaging demonstrated moderately dilated lateral ventricles

MRI was done which show small cystic lesion in anterior aspect of the third ventricle at foramen of Monro, measuring about 10.5x8 mm in size. On T2 weighted images the lesion was hyperintese, hypointense on T1 weighted images. The lesion shows eccentric focus within, concerning for scolex.(Figure 2a,b,c).

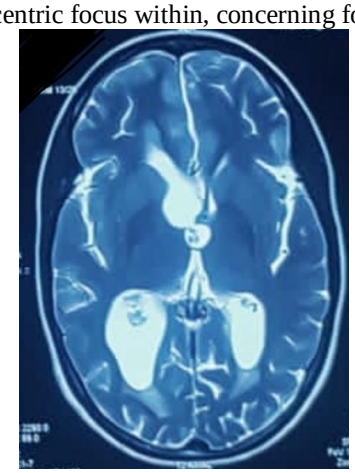

Fig. 2a

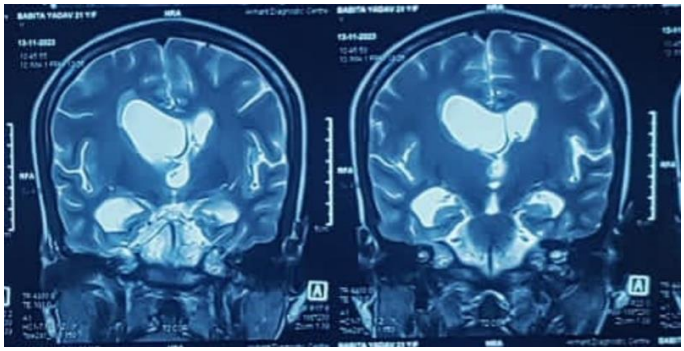

Fig. 2b

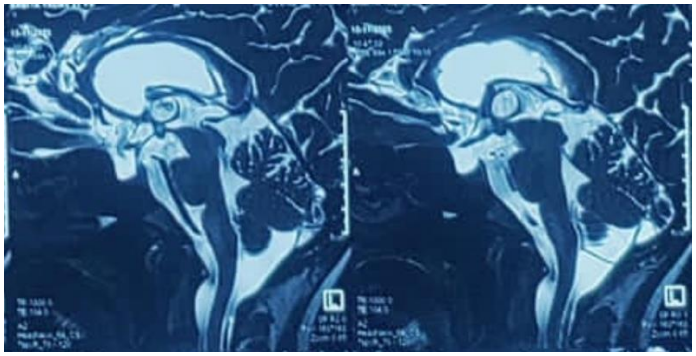

Fig.2c

Figure 2: a)axial, b)coronal, c)saggital sections MR scan of brain The lesion is hyperintese on T2 weighted images,.The lesion shows eccentric focus within, concerning for scolex.

Operation: We came up with a surgical strategy to treat hydrocephalus and remove the cyst. Patient taken for operation in semi-setting position under GA, a right sided coronal parasagittal craniotomy marked, and box craniotomy done. After opening the dura, via interhemispheric approach the anterior corpus callosum identified as cyst is adherent to the third ventricle the anterior transcallosal approach is suitable for removal of cyst, callosal dissection done using bipolar blunt dissection, lateral wall of ventricle identified and choroid plexus seen. After identifying foramen there is small yellowish adherent cyst(Figure 3),which was removed en bloc without rupturing. The cyst was approximately 1.2 cm in diameter and yellowish -green in colour; it had a pearly white area within it that represent a scolex probably (Figure 5).

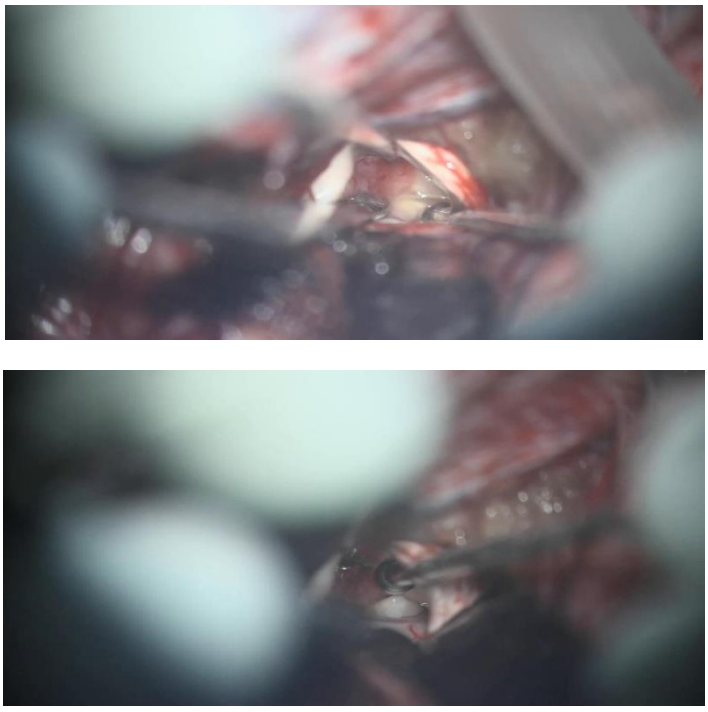

Fig. 3: Intraoperative image of cyst.

Fig.4: Gross view of intact cystic mass immediately after resection.

There was no active bleed from operating site and foramen of Monro kept open.The flow of cerebral spinal fluid(CSF) was resumed. We used a double-sided clamp technique to execute a bone flap cranioplasty and a watertight dural closure. The patient underwent an uneventful postoperative period and was discharged from intensive care within the first 8 hours. After surgery, she took 24 hours to fully recover from her presenting symptoms. CT showed complete cyst removal and no complications (Figure 5). Histological analysis confirmed NCC.

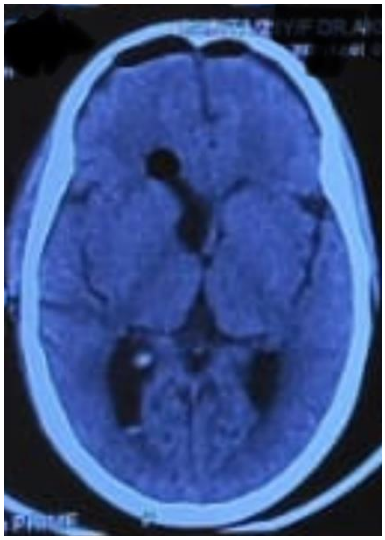

Fig: 5 Postoperative Non contrast CT imaging demonstrated complete excision of cyst.

Discussion:

Hydrocephalus has been associated to a high death rate in extraparenchymal NCC cases.[1] The diagnosis of NCC is aided by Del Brutto's criteria. Histological characterisation and cystic lesions with scolex on neuroimaging are examples of absolute criteria.[2]

Acute cerebrospinal fluid (CSF) flow obstruction through the ventricles, blockage of the Magendie and Luschka foramina, or an inflammatory response leading to aqueduct stenosis are the main ways that the disease manifests itself in 12% of patients.[3] We report on a patient who developed the rare Bruns' condition, which is brought on by a mobile intraventricular cyst that causes acute hydrocephalus to occur in episodic bursts.[4] This syndrome was first identified in the fourth ventricle NCC, but it also happens with third ventricle cysts and tumours.[5]Medical records and epidemiology can help determine the possibility of a diagnosis. In this case, the presence of the scolex within the cyst, in addition to the patient's epidemiological setting, led to NCC as the first diagnostic hypothesis. Surgical and medicinal therapy options include corticosteroids and antihelminthics.[6]

In cases of intraventricular neurocysticercosis (NCC), the surgeon's experience, the patient's health, and the cyst's location all play a role in the decision between aopen microscopic approach and endoscopic excision. Although the endoscopic method is less invasive and could result in faster recovery times, it might not be suitable in many situations, particularly if the cyst is mobile, large, or situated in a difficult place.[15]We chose an open transcallosal approach to the third ventricle, wherein the cyst was successfully removed. Although the endoscopic approach to the third ventricle has been reported as successful, it involves passing a flexible endoscope through the ventricle, which poses a significant risk of neurological deficiency and intraventricular haemorrhage. [6,7]The greatest advantage of the open microscopic transcallosal approach is that it avoids cortical incision and provides natural planes for dissection to the anterior part of the third ventricle. Additionally, this method offers a variety of routes to enter the lateral ventricle and proceed to the third ventricle.[15] According to a published study, 40% of patients with intraventricular NCC required a shunt in 43.5% of cases.[8]The use of the transcallosal route in colloid cyst surgery does not result in any serious neurological or psychological consequences.[9,10] We emphasize that our patient's condition was effectively treated with a single surgerya shunt was not required. The significant shunt failure rates in NCC make this relevant.[11] The application of medicine to treat intraventricular NCC is still controversial. Antihelminthics are advised in cases of parenchymal NCC, however when surgery is possible and the cyst is removed whole, there are no evident advantages in cases of intraventricular NCC.[2,12]

Conclusion:

With time, endoscopic procedures have improved and are now seen as a viable substitute for microneurosurgery. Still there is some limitations to endoscopy like difficulty in radical cyst excision which is attached to the roof of third ventricle.The

surgeon operating on a neurocysticercosis should be aware of all the possible approaches to the lesion and should be able to choose the best route. Open surgical procedure in the era of endoscopy was used to successfully treat the patient, avoiding the need for a ventriculoperitoneal shunt.

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