

A Catheter Assisted Modification Dowling Technique of Surgery for Intracerebral Hydatid Cyst/ A Case Report

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Abstract:

The aim of our study is to avoid complication associated with a craniotomy for removal of a big cerebral hydatid cyst like cerebral hemorrhage ,CSF leak, cerebral shrinkage and to prevent the formation of a new large volume acquired cyst instead of the original lesion.

Materials:

By this new maneuver study, cerebral hydatid cyst were evacuated completely in tow patients. Catheter fill in (100 cubic centimeter) air/normal saline & put in hole of cyst till catheter occupies all hole of cyst . Air/normal saline emptying is going to average equal to 15 cubic centimeter | 24 hours then beyond a seven days, Finally catheter released.

Outcome:

Hydatid cysts is evacuated with no bursting. No intra & postoperative complication are seen such as balloon rupture , seizure, CSF leak, hemorrhage and serous infection.

Summary:

Balloon dowling maneuvers may be a good maneuver to a void cerebral shrinkage, intra and postoperative complications associated with this maneuvers.

Key Words:

Dowling maneuvers, hydatid sand, cerebral cyst, intra operative complication, surgical maneuvers.

Collection of data:

In our research the collection of data performed in Nasiriyah teaching hospital, tow patient well prepared for surgery with routine preoperative radiological and hematological investigations, fasting at least six hour pre operatively, blood preparations and instruct the patient for preoperative order for steroids, antiepileptic medications, prophylactic antibiotics and DVT prophylaxis like pneumatic compression boots or knee- high TED hose.

Operative Procedures:

- 1.Patient enter operative room and sleep on table and induction of general anesthesia placed on lateral position, the head is positioned so that the cyst points straight up towards the ceiling when the OR table is 30 head up.
- 2.Drilling burr holes and performing craniotomy must be done very carefully to avoid rupturing the cyst or tearing the dura which is thin and under tension .
- 3.Dont coagulate with anything but low- power bipolar (to avoid cyst rupture).
- 4.Open the dura circumferentially away from the dome of the cyst as it may be adherent to the dura.
- 5.Keep the surface of the cyst moist to prevent desiccation and rupture.
- 6.Open the thinned overlying cortex gently ,separating it from the cyst with irrigation and cottonoids. The cortical opening need only be = 3/4 the cyst diameter but no less.
- 7.Insert a soft rubber catheter between the cyst and the brain , and gently irrigate with saline as the head of the OR table is slowly lowered 45 while the surgeon supports the adjacent cortex with his or her fingers.
- 8.Continue irrigating more saline and float the cyst out and into a saline filled receptacle and permit tip & the un inflated division of catheter probe introduce lacking puncturing cerebral content. Catheter probe advance gradually to bottom & to area anatomizing are needed of catheter probe of foley probe are fill in 100 cubic centimeter air / normal saline put to sac till catheter fill in whole sac .The catheter emerge from a small incision of scalp flap. Wash the cavity with hypertonic saline for 5 minutes. Water tight dural closure

and closure layers by layers. Air / normal saline eradication continue to 15 cubic centimeter / day & beyond a period of time , catheter are eradicated.

OUTCOME:

The result of craniotomy was good, no intra or postoperative complications

All cyst removal without rupture, no CSF leak , no hemorrhage, patient transfer from RCU to ICU in second day with good health condition.

all

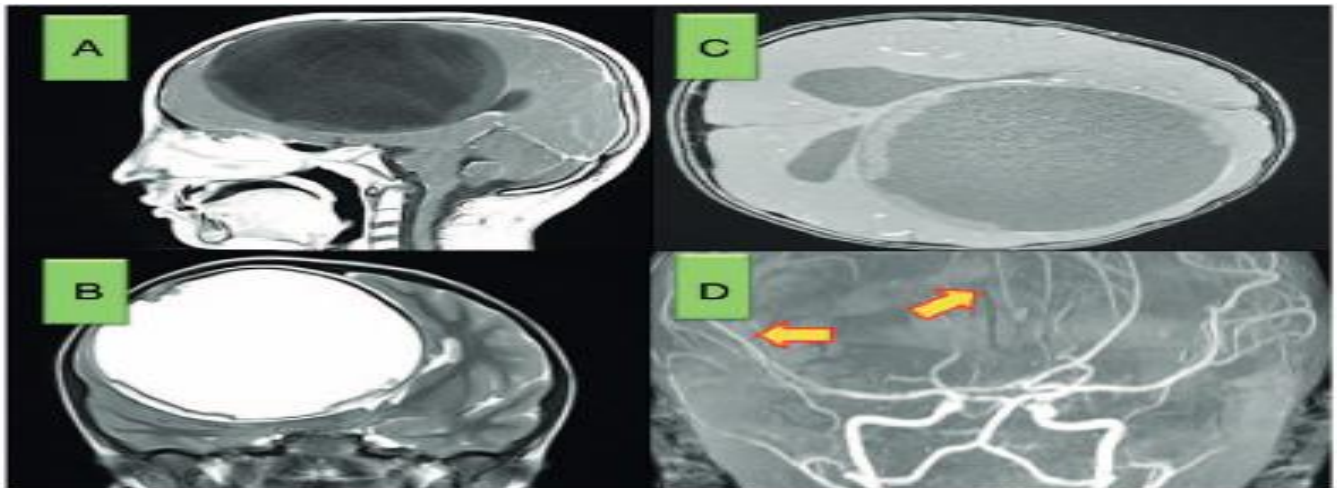


FIGURE 1. A huge hypointense cystic mass located in the frontotemporoparietal region. The lesion compressed the brain ventricles, parietal, frontal lobes, and also brainstem (A, T1-WMRI); frontal, temporal, and occipital lobes with lateral ventricles (B, T1-WMRI); contralateral hemisphere (C, T2-WMRI). The lesion displaced the MCA, ACA, and Willis poligon arteries (D, MRA).

Maneuver one:

A female in second decade complain from vertigo, blurring of vision, nausea, ipsi lateral lt arm & leg weakness, increase temperature for last two weeks & speech difficulties. The female was conscious, oriented, and GCS was (14).Female presented with history of seizure before one month. The patient had Bell 's palsy. Ophthalmological examination revealed one eye with optic atrophy and other eye with papilledema. Radiological examinations were normal regarding liver and lung. Brain MRI& Computed tomography (CT) scan reporting a large single avascular sac in RT fronto-parietal lobe about 9x10x10.5cm in diameter, occupying often whole RT fronto_parietal lobe, making pressure of cerebral structure to contra lateral side, pressure of the opposite ventricle, and displaying vascular structure (picture 1a-d).The CT density of the cyst is similar to the CSF density , it does not enhance but there is rim enhancement because of inflammatory reaction and there is little surrounding edema. Laboratory evaluation show marked eosinophilia.. Operation are applied and

sac removal completed by the Dowling maneuvers by RT fronto - parietal craniotomy (picture 2a).Tinny cerebral cortex shrinkage to large sac after eradication cyst (picture 2b and c). Application a catheter to sac cavity & a catheter with pressure-controlled shutter are fill in by 100 cubic centimeter of air to avoid shrinkage adjacent cerebral tissue to sac. (picture 2d). Elimination (15 cubic centimeter/24hrs) air from the catheter. Brain computerized tomography scan on the 1st post op. day reveal partial expansion of the cerebral tissue & a few CSF aggregation at the out roof of air-filled catheter. Brain computerized tomography scan at fourth post op. day appear more increase of the cerebral tissue & few SD CSF aggregation (pictures 1a-d, 3e, f). Catheter extracted at eighth post. op. day. Patient is well& good.

Maneuver two :

Young patient in 3rd decade suffer from abdominal pain, vertigo, nausea ,papilledema in both the eyes, weakness of four limbs ,increase

temperature for last three weeks. The patient male was fully conscious, cooperative, and GCS was 15. Ophthalmologic examination appear bilateral papilledema, and venous engorgement. Mental function was good. On abdominal ultrasonography reveal septated liver cysts and uses of ultrasound - guided thin -needle aspiration of hydatid cyst for diagnosis. Patient have eosinophilia .On brain MRI there is no enhancing cystic structures with eccentric T1W1 hyper intensity(scolex) with slight inflammatory response. Brain MRI &CT scan appear a large single sac in RT sided lobe about 8x9x10 cubic meter , occupying often all RT fronto-parietal region of LT area, making pressure of opposite cerebral structure, pressure of the opposite ventricle (picture 4a).Craniotomy started and sac emerge by the Dowling maneuvers by fronto-parietal approach .Sac appear beneath tinny cortex (picture four b) & evacuated sac appear at picture (4c-a) large cranial sac appear beyond cyst evacuation & tinny & bending encephalon cortex

shrinkage to the sac. Catheter with an effort grip shutter are fill in with 100 cubic centimeter of normal saline and enter to sac till catheter fill in whole sac (picture five). The water evacuated through effort grip shutter according to effort of sac cavity. Discharging equal to 15 cubic centimeter/24 hours. Finally, Catheter extracted at eighth days after surgery. Computerized tomography reveal sac cavity thirty days after surgery shown at picture *tow (e)*. Brain CT scan beyond 36 months after surgery was good (picture2f). picture 3 appear all maneuvers of air/normal saline-fill in balloon to inter to sac cavity & its job section. Catheter is made through specialist friend (AHS), and can be used in a safe method in patients. Picture 6 reveal air/water-filled cavity catheter after insertion to after operative empty cavity of the brain. Picture 4 also appear post operatively of air/water-filled catheter in the cyst cavity.

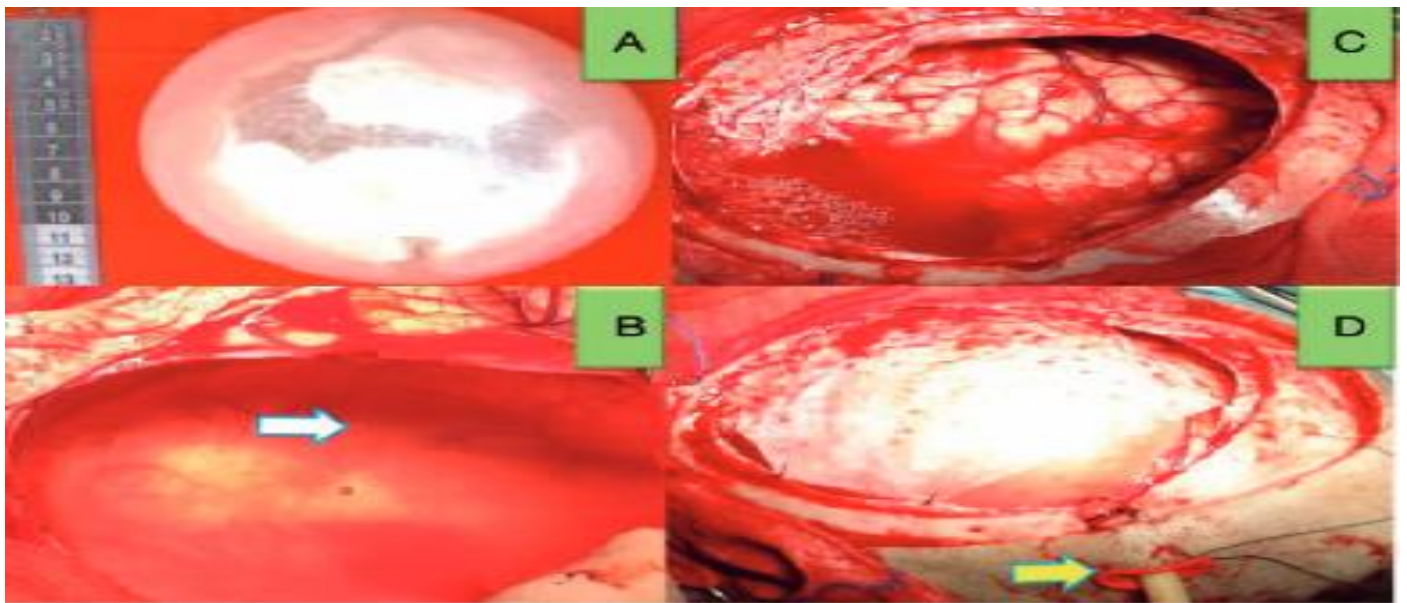


FIGURE 2. Delivered cist with 12 cms in diameter (A), collapsed thinned brain cortex (B), cist cavity (C), and air-filled balloon is seen the cavity. Yellow arrows balloon catheter to evacuate air form balloon by daily periods (D).

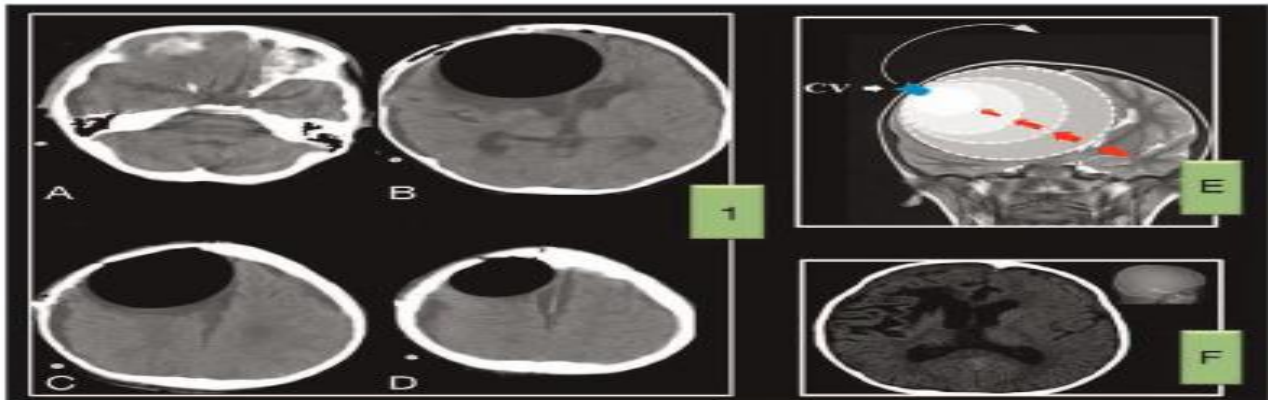


FIGURE 3. Air-filled balloon is seen in the cyst cavity by various CT levels (A–D/ 1). Schematic representation of applied balloon using method designed by ourselves (2). And 6 months later CT shows minimally subdurale effusion and encephalomalasic areas. CT, computed tomography.

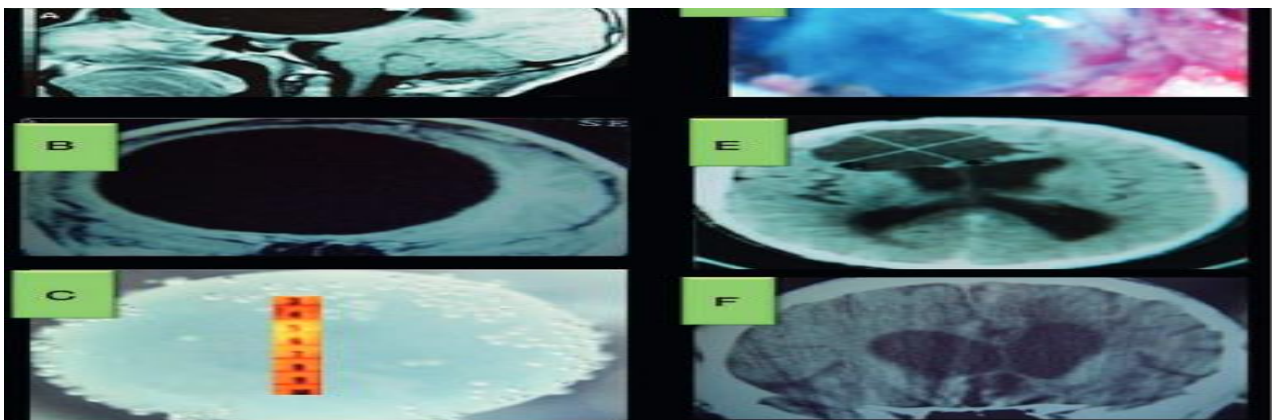


FIGURE 4. A huge hypointense cystic mass located in the ontotemporoparietal region. The lesion compressed the brain ventricles, anietal, frontal lobes, and also brainstem (A, T1-WMRD); frontal, temporal, and occipital lobes with lateral ventricles and contralateral hemisphere (B, T2-WMRD). The cyst was delivered as intact (C). Inserted water-filled balloon is seen (D), cyst cavity after balloon drawn from brain (E) and 2 years follow-up computed tomography appearance (F).

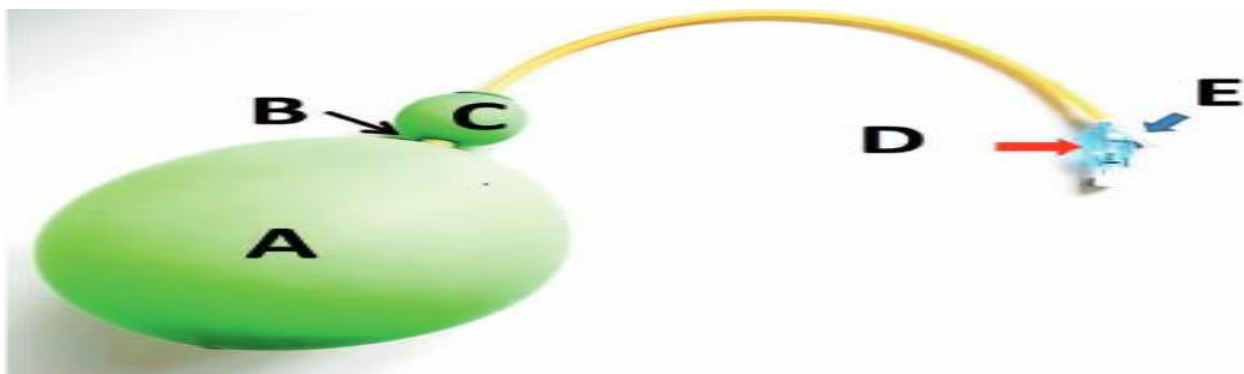


FIGURE 5. Photographic representation of air/water-filled balloon to insert in cyst cavity and its functional parts are seen. Air/water-filled cavity balloon (A) after insertion to postsurgical empty cavity of brain. Air/water injection cannula to swell of security balloon and pressure valve (C), burr hole location part (B), air/water injection cannula to swell of cavity of balloon (D) and pressure regulating subab valve of security ballon (E).

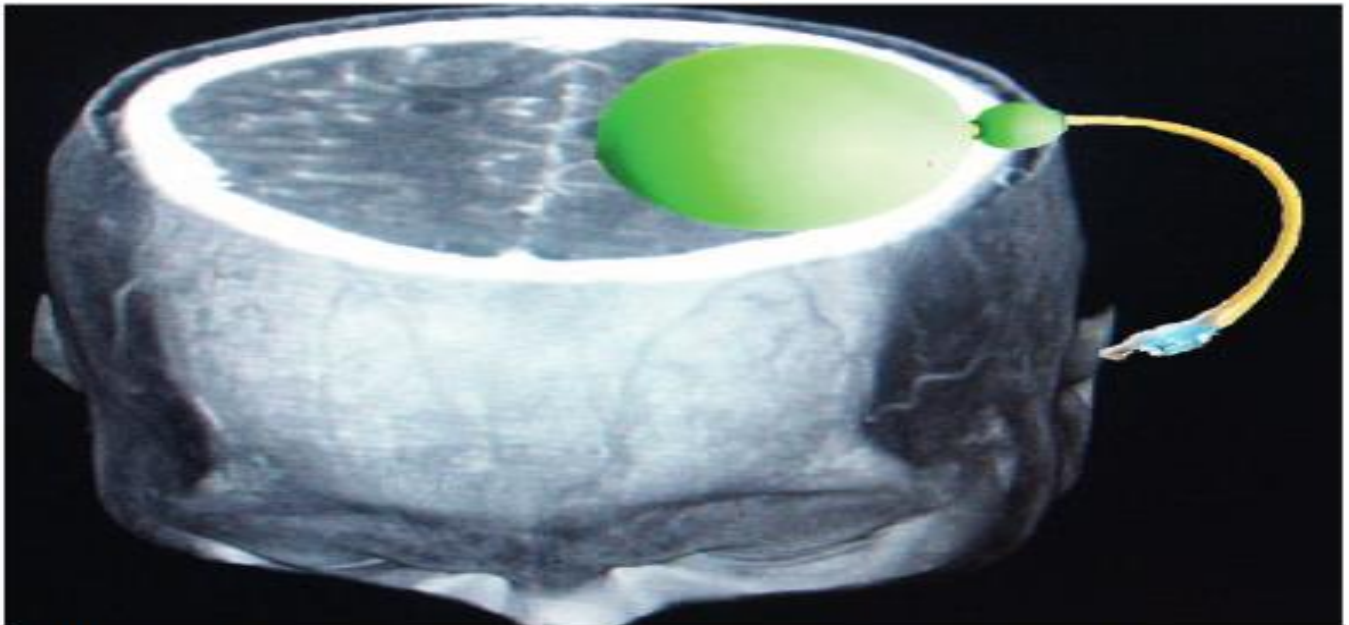


FIGURE 6. Photoschematic representation of air/water-filled balloon in cyst cavity and its functional parts are seen.

Discussion

Surgical maneuvers of hydatid Cyst Removal summary:

Hydatid (cyst) disease caused by encysted larvae of the dog tapeworm *Echinococcus granulosus* in endemic areas (Uruguay, Australia, New Zealand...).⁽¹⁾ Treatment is Surgical removal of the intact cyst for those producing sign and symptom of raised ICP. Every effort must be made to avoid rupturing these cysts during removal, or else the scoleces may contaminate the adjacent tissues with possible recurrence of multiple cysts or allergic reaction.⁽²⁾ The operative procedure called Dowling maneuver requires excision whole sac utilize hydrostatic bursting through pushing water liquid to transmute the sac.⁽³⁾ Craniotomy surgery take principle which differ to various surgical procedure,⁽⁴⁻⁵⁾ & own maneuver made a plan through knowledge method.⁽⁶⁻⁷⁾ For example, through craniotomy operations for hydatid cyst removal, adhesions on adjacent structure of the cyst wall when removed, rupture of vessel may occur & make important issue & stops by soft cottonoid pressure, application gelfoam or surgical to overcome this problem. Command to correctly identify all rupturing vessel origin due to careful isolate sac wall beneath a lot of hemorrhage.⁽⁸⁾ Technique of inserting normal

saline between the wall sac & the beneath parenchyma of great benefit.⁽⁹⁾

A knowledgements of our maneuver :

Before the appearance of microscope & endoscope and advance technique in neurosurgical field operations, Dowling portray his maneuvers since (one thousand nine hundred twenty nine).⁽¹⁰⁾ There is some intra & postoperative complication have been seen.⁽¹¹⁾ One of the most important intra operative complication is cyst rupture & every effort must be made to avoid rupturing these cysts during removal, or else the scoleces may contaminate the adjacent tissue with possible recurrence of multiple cysts or allergic reaction, Encephalitis & meningitis or cerebral abscess. The post-operative complication like CSF leak, collection, seizure, Contralateral weakness from injury to adjacent motor area have been reported. Delayed cerebral vasospasm one of the most important complication may be occur in surgical removal of hydatid cysts.⁽¹²⁾ Tension air within cerebral content & produce mass effect and sign & Symptom of raised ICP, Wound dehiscence, ICH, Sub dural hematoma, Brain swelling occur because of fast brain enlargement, cerebral conning, and skull bone at site of surgery shrinkage are disadvantage 2ndarily to development a large amount cavities &

encephalon structure shrinkage to deep hollow on extraction a large E. cysts. The percentage of death is seven % on extraction a brain E. cysts in comparison to encephalon shrinkage.⁽¹³⁾ SDH may occur after hydatid cyst surgery.⁽¹⁴⁾ Death also may occur from this complication.⁽¹⁵⁾ Encephalon vasospasm is disadvantage beyond SAH attributing whole fatal outcome.^(16,17) Reason for a late encephalon vasospasm occur from critical encephalon convolutions, wall vessel twisting, intrecacy ischemia, infarctions, and necrosis & clot aggregation because SD vessels breaching due to encephalon vessels had little smooth muscular & adventitial layer compared to other vessels.⁽¹⁸⁾ Subtle increase in ICP 2ndarily to huge E.granulossus sac take place in echinococcosis. Increment upload of ICP is the main further consequence beyond cyst removal operation. Big E. granulossus sac lead to large bulks and S&S of raised ICP before surgery. Magnetic resonance imaging with godalinium & Brain C-T scan is recommended as screening procedure of choice before planning of surgery for localization & properties of IC abnormalities.⁽¹⁹⁾ Beyond operation, large sac appear on consequence brain computerized tomography & magnetic resonance imaging . To prevent such disadvantage following this surgery we described a cheap, quick, easily applicable, and reliable technique with low cost to the patients. The technique requires applied of a catheter fill in with air \ water liquid to sac in which cyst were removed. Shutter of catheter unclose when catheter pressure above natural ICP& tighten if catheter pressure below ICP. The controllable shutter of catheter employ which it unclose when catheter pressure more than the natural ICP & will tighten when catheter pressure is below ICP. Automated particular of catheter must be checked before

utilization. Magnetic resonance tracto graphy achieved in spite of encephalon cortex is very dilute. Two clarifying adjective announcement hand over portray clue regarding this maneuvers. Ulutas et al ⁽²⁾ have explained their expertise in pull out four huge encephalon cysts in three patients utilizing catheter supported maneuver with benefit. Litterateur have put Foley probe in exact division among the cyst wall & natural encephalon structure & have inflated catheter of Foley probe instead of water flooding as the common procedure. The Foley catheter was advanced & concurrently the original twelve gauge Foley switch with fourteen & sixteen gauge foley catheters. Contra indication of our maneuver is cyst with calcification or infections.⁽²⁰⁾ Tow balloon supported maneuvers were application for extracting huge cysts. Nonetheless, benefit of our maneuvers is to counter cerebral parenchymal shrinkage beyond extraction huge cyst. So this new maneuver is differ from previously described ones.

Summary

Our surgical maneuver is simple, cheaper, low cost on the patient, easily applicable, good procedure to prevent intra & postoperative disadvantage may contribute as after effect of large amount cavities beyond removal a large encephalon cysts. Our method is a great maneuver to avert cerebral shrinkage, cortical bending & have good patient out come without any complication postoperatively. Our consideration purpose to place of our maneuver may lead to guidance judgment of difficult threatened of consequence issue of sac cavity on postoperative disadvantage in encephalon cyst disease.

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