Orbital Hydatid Cyst: An Easier and Safer Removal Through Anterior Orbitotomy Approach

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ABSTRACT:

BACKGROUND:

Hydatid Cyst of the Orbit is a rare manifestation even in endemic areas. It presents as a silent proptosis with or without visual function impairment. Many surgical procedures have been implemented for cyst removal including transcranial, lateral orbitotomy, tansmaxillary sinus, rhinotomy, and anterior orbitotomy. Post-operative complications endangering visual function and locally were reported with some of these approaches.

A new simple, easy, and quick procedure was improvised with no significant complications. The procedure is described in details.

KEY WORDS: orbit, hydatid cyst, orbitotomy.

INTRODUCTION:

Hydatid disease (cyst) is a parasitic infestation by a tapeworm of the genus *Echinococcus granulosus.* It is found in Africa, Europe, Asia, the Middle East, Central and South America, and in rare cases, North America.(1)

It is not endemic in the United States, but the change of immigration patterns and the improvement of transcontinental transportation over the past four decades have caused a rise in the profile of this previously unusual disease throughout North America.(2)

It can affect any part of human body. However, there is no mention in the literature of teeth, hair nor nail involvement.(3)

Orbital hydatid makes a very low percentage compared to other body organs. In many publications the incidence is 1%. (4,5) However, in an unpublished personal study of 1980 cases of body hydatid the orbital incidence is 0.2%.(6)

It presents as progressive silent proptosis with no serious visual function involvement or with marked impairment of vision and squint.(6)

The (ectocyst) is a soft gelatinous like layer of about one millimeter thick lined with the endocyst (the productive germinal layer) inside it is the hydatid fluid. The cyst is covered by a thick one millimeter fibrous layer produced by the body. Fig (1)

Surgical removal of the cyst is the only sure means of treatment. However, this has to be with no or minimal damage to the orbital tissue and visual function.

Many orbitotomy approaches were used for removal of the cyst. Those included transcranial (7,8) rhinotomy(9), maxillary sinus(10), and lateral orbitotomy(11,12,13,14) or via anterior orbitotomy(15,16) and some applied cryo extraction17 and formalin.(12)

Transcranial and lateral orbitotomy were applied personally in the early days of CT scanning in Iraq as orbital cyst was shown as high density homogenous tumor and not a cyst filled with clear fluid, unlike its density in other body organs. This was explained and published.(18), Fig. (2)

As diagnosis became assured of the cystic nature of hydatid with ultrasound and MRI, no more craniotomy was considered.

From dealing with more than 30 orbital hydatid cysts it was concluded that the best approach was an anterior orbitotomy with some surgical tips as an easy and safe procedure.

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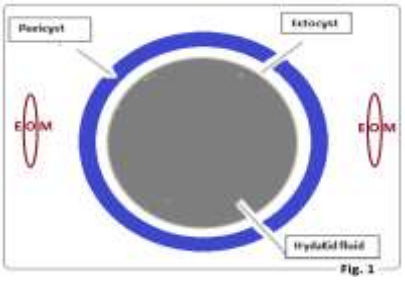


Fig 1: The layers of Hydatid cyst with extra ocular muscles (EOM)/.

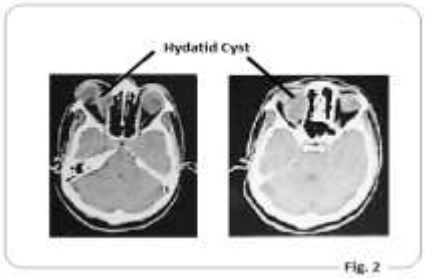


Fig 2: CT scan of head showing orbital cavity with hydatid inside the orbit.

Procedure (anterior Orbitotomy):

After a temporary tarsorrhaphy an incision is made in line with skin folds of no more than 2 cm to include the skin thickness only (Figure 3). Then cut through the orbicular in line with the skin incision but preferably not immediately underneath it. Orbicularis muscle is retracted with stay sutures at its edges.

Gently deepen the dissection through the orbital septum until the adventitial layer (pericyst) is reached. This is a rather tough and smooth layer of fibrous tissue which is laid down by the orbital tissues to isolate ectocyst from the orbit proper. Extreme care is taken not to rupture the cyst during dissection. If accidentally it ruptures at this stage a complete removal of the collapsed cyst would be rather difficult and may endanger orbital contents.

Two mosquito artery forcepses are applied to the pericyst to hold it firmly with few millimeters away from each other and make a very small incision through the pericyst in between the mosquitos and enlarge it with blunt Mayo scissors to about one centimeter (Figure 4). The ectocyst which is immediately underneath the pericyst is exposed. This is a shining, milky colored and soft gelatinous layer inside which is the cyst fluid. (Figure 5)

Keep the sucker tip by the ectocyst and tear it by pinching with a non-toothed forceps. Allow the fluid to escape with a sucker applied to the depth of the field with a cottinoid patty at its tip to protect orbital tissue from being sucked in. Make sure that all fluid is sucked out. Take about 1-2 cc of the fluid for laboratory testing for scolices and chemical analysis.

The ectocyst, which is not attached to the pericyst collapses inside cyst cavity. It is gelatinous, soft and is easily torn layer of about 1-1.5 mm thickness. Now the ectocyst must be removed completely. Hold the ectocyst with a non-toothed forceps with minimal force just to prevent it from slipping. If you press hard with the forceps firmly it will cut through.

While holding the ectocyst with a forceps take another non-toothed forceps with your other hand and hold the cyst few millimeters lower down in the pericyst cavity (Figure 6).

Keep alternating between the two forcepses with gentle pull of the cyst out from the cyst cavity. (Figure 7)

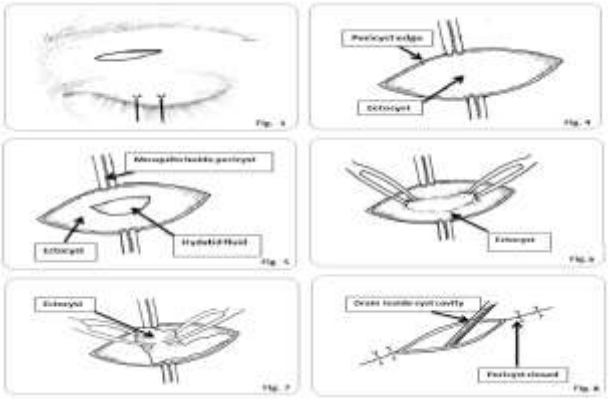
Keep pulling slowly until you get the cyst fundus out of the cavity. Examine the cyst wall after delivery and make sure that it is intact except for the torn area. Make sure that no shred of cyst remains inside or outside the cyst as recurrence is very likely then.

Wash the cavity generously with normal saline with continued suction. This surplus washing helps washing out any remnant of the ectocyst. Also it

helps washing out the allergens present in the cyst fluid which may complicate the early post-operative period with massive edema of the orbit. (6)

A drain is put inside the cyst cavity kept for one or two days post operatively.

The two mosquitoes are removed, and the pericyst is sutured followed by suturing of the orbicularis muscle (Figure 8). Skin is closed by subcuticular or interrupted sutures. The temporary tarsorrhaphy and the drain are kept for 24 hours. In case of post-operative edema it may be better to keep both for one or two days more.



RESULTS:

This new simple anterior orbitotomy technique with application of the surgical tips mentioned in procedure proved to be the best approach for removal of orbital hydatid cyst.

It is an easy surgical technique, less time consuming and safer to the orbital contents.

Pericyst is a tough fibrous tissue layer of about one millimeter thickness firmly adherent to the surrounding orbital tissue. It surrounds the cyst but not attached to the inside ectocyst. Removal of the pericyst harms orbital contents. Recalling a young lady had orbitotomy abroad and removal of pericyst which resulted in a frozen eye movement and blindness (6).

Leaving pericyst in place after removal of the ectocyst will have no harm and be part of orbital contents.

Complete removal of the endocyst is a must followed by generous washing the cyst cavity will minimize post-operative orbital tissue allergic reaction which my happen next day with progressive orbital edema and pain.[6]

Use of formaldehyde in orbital hydatid as use in other organs is unnecessary and can be dangerous as it causes tethering of the orbital tissue and periorbital skin.[6-12]

Fertility of orbital hydatid is questionable and on many occasions tested the orbital fluid microscopically and found it sterile of any scolices[4] contrary to cysts in other parts of body where it may reach up to 400,000 scolices in cyst fluid.[19]

There were occasions where cyst seen bilobed or may have some daughter cysts. These patients usually have history of direct trauma to the orbit. Added to the fact that none of our thirty cases of orbital hydatid came back with recurrence. Follow up was up to 15 years.

Albendazole better be given postoperatively in all cases except in the very rare occasions when the cyst is removed intact. It is recommended to use albendazole in a dose of 400mg twice daily for 6 weeks.

DISCUSSION:

Hydatid cyst is a rare orbital disease except in some developing countries. However, with people migration and immigration one may come across it in developed countries too. As an orbital space occupying lesion it presents as silent progressive proptosis. Increase in size is caused by slow accumulation of cyst fluid produced by the endocyst. Proptosis is seen with or without visual symptoms. Diagnosis was based on clinical skills and CT scan. That resulted in misinterpretation of the nature of cyst to be a solid tumor.[18] With MRI and good Ultrasound diagnosis is more accurate now.

Treatment is surgical aiming at complete removal of the cyst. Considering many surgical procedures for cyst removal with possible complications, this paper presents a simple and sure technique with minimal or no complication.

This procedure as described above was adopted after years of dealing with many hydatid cysts. It is an ordinary anterior orbitotomy, but with some technical tips which are easy to implement.

Post-operative complications were negligible except for some cases that developed periorbital edema in the first post-operative day. This was prevented eventually by washing the cyst cavity with surplus saline. This edema was due to local reaction intracyst allergens.[20]

It must be emphasized that attempting removal of the pericyst is never recommended. It carries great danger to the orbital contents and very dangerous as it is adherent to the orbital contents.

CONCLUSION:

This paper describes a personal experience with more than thirty orbital hydatid cysts. Being a neurosurgeon with ophthalmic background, the author has tried trancranial, lateral and anterior orbital approaches. Other orbital surgeons have tried transmaxillary and via rhinotomy. In this paper the described anterior orbitotomy is an easy, quick and with very minimal complications.

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