The Egyptian Journal of Hospital Medicine Vol., 17 :155 – 166 Dec.2004
I.S.S.N: 12084
1687 -2002

Evaluation Of Hydatid Disease (Echinoccosis) In Algmeil Hospital (2002 – 2003)

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Abstract:

Hydatidosis is a zoonotic parasitic disease caused by the dog tapeworm *Echinococcus* and its larval stage, the hydatid cyst. Humans can accidentally become intermediate hosts by ingesting the eggs of the tapeworm. While most cysts deve lop in the liver and lungs. animals. At present, four species of the genus *Echinococcus* are recognized and regarded as taxonomically valid*: E. granulosus* (cystic hydatidosis), *E. multilocularis* (multivesicular hydatidosis), *E. vogeli* (polycystic hydatidosis) and *E. oligarthrus (Soulsby, 1982).* A total number of 23 patients were included in this study. 13 patients were females while the rest 10 were male patients. All cases were properly diagnosed as Hydated disease and then treated in the surgery Department of Algmeil Hospital (Libia) in the last 2 years (2002 and 2003). Proper investigations as well as treatment were carried out. The obtained results were statistically analyzed. Four types of presentation of the disease were observed in this study and presented, Asymptomatic 78.26%, Obstructive jaundice 8.69%, Accidental rupture 8.69% and Pressure symptom 4.34%. In spite of the progress in these areas, echinococcus/ hydatidosis remains a serious public health problem in a number of countries. It is very important to support and implement new control programmes so as to prevent further spread of the disease. Research in possible **vaccines** is essential in order to supplement the existing methods of breaking the Echinococcus life cycle.

Introduction and historical review

Echinococcosis/hydatidosis is a zoonotic parasitic disease caused by the dog tapeworm *Echinococcus* and its larval stage, the hydatid cyst. This parasite is found worldwide and causes serious public health problems in certain parts of the world *(Schantz, 1990)*. In addition there are economic losses from the condemnation of affected organs.

Echinococcosis is a cyclozoonosis that requires two vertebrate hosts to uphold the life cycle. Humans can accidentally become intermediate hosts by ingesting the eggs of the tapeworm. While most cysts develop in the liver and lungs, other organs arid tissue may become affected *(Soulsby, 1982)*.

The wide variety of animal species that can act as intermediate hosts and the domestication and spread of some of these animals from Europe to other parts of the world has given *Echinococcus granulosus* a worldwide distribution. It has been extensively studied in a number of different geographical areas and is now present in Asia, Africa, South and Central America and the Mediterranean region *(McManus and Smyth, 1986)*. It is also common in parts of the United Kingdom, Europe and Australia *(Cook, 1989; Schantz, 1990)*.

Some countries, such as Iceland and Cyprus, have already eradicated or are close to eradicating the disease. Control measures in New Zealand and Australia (Tasmania) have significantly reduced the prevalence of *E. granulosus*, and successful control programmes are currently being conducted in Turkana (Kenya), Chile and the People's

Republic of China (Schantz, 1990; McManus and Smyth, 1986).

Although control programmes resulting in a marked decrease in the incidence of the disease have been carried out in some countries, little effect has been achieved worldwide. There is some evidence that the disease is spreading because of a lack of meat control, dog management and appropriate legislation *(Gemmell 1979; Schwabe, 1986).*

The epidemiology and control of hydatidosis is often considered to be a veterinary matter since the disease can be regulated by controlling parasites in animals. However, collaboration between veterinarians and public health workers is essential for the successful control of hydatidosis *(Thompson and Allsopp, 1988).* At present, four species of the genus *Echinococcus* are recognized and regarded as taxonomically valid*: E. granulosus* (cystic hydatidosis), *E. multilocularis* (multivesicular hydatidosis), *E. vogeli* (polycystic hydatidosis) and *E. oligarthrus (Soulsby, 1982).*

These four species are morphologically distinct in both the adult and the larval stages. In addition, several different strains of *E. granulosus* and *E. multilocularis* are recognized *(FAO, 1982)*. The development of strains may be a result of the fact that tapeworms are hermaph-rodites, which reproduce themselves through cross- or self-fertilization. A single mutant can therefore produce large genetically identical populations that differ from the original genus. These populations are referred to as strains *(McManus and Smyth, 1986)*.

The adult tapeworm is found in different parts of the small intestine of the definitive host, from where segments containing eggs are passed with the faeces. When ingested by the intermediate host, the eggs are immediately infective, releasing larvae that penetrate into the lymphatic or vascular system, reaching the liver or lungs and possibly other organs .

The hydatid cyst develops slowly over several months, forming an outer laminated membrane and an inner membrane called the germinal layer. From the germinal membrane brood capsules develop, each containing one or several invaginated heads (protoscolices) that can develop into the adult tapeworm upon ingestion by the definitive host *(Soulsby, 1982)*.

The number of infective eggs ingested by the intermediate host is therefore determined by the level of contamination and the infectivity of the eggs. Furthermore, the number of eggs that develop into hydatid cysts is controlled by the immune system of the host *(Thompson and Allsopp, 1988)*.

In the definitive host, a post-mortem examination is the most reliable method of diagnosis. Examination of the faeces after using arecoline as a purgative is less reliable, although proglottides in the faeces is conclusive. Egg counts are not specific because of the similarity of eggs from other tapeworms of the Taenia family *(FAO, 1982)*.

Serological screening has recently proved to be a powerful tool in detecting infected dogs *(Gasser et al., 1990)* and is superior to the arecoline testing.

In the intermediate host, diagnosing hydatidosis is possible through scanning, radiology, serology and postmortem examination. The post-mortem examination of sheep is usually an important component in monitoring the efficiency of control programmes.

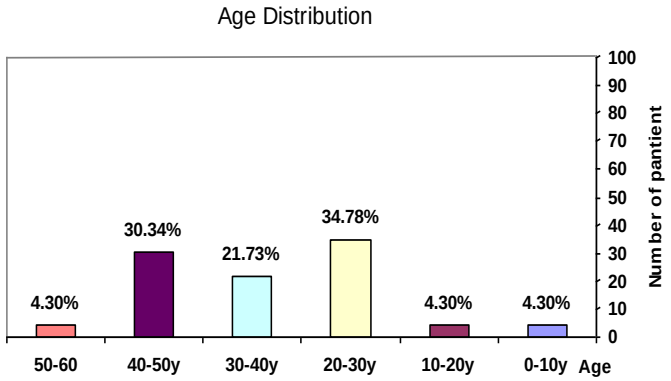
Patients and methods

A total number of 23 patients were included in this study. 13 patients were females while the rest 10 were male patients. All cases were properly diagnosed as Hydated disease and then treated surgery Department in Algmeil Hospital in the last 2 years (2002 and 2003). Proper investigations as well as treatment were carried out. The obtained results were statistically analyzed and represented by statistical presentations(Chart and pie).

Results of the study

1- Age distribution

The variation in the age in the cases used in this study is listed in the following chart:

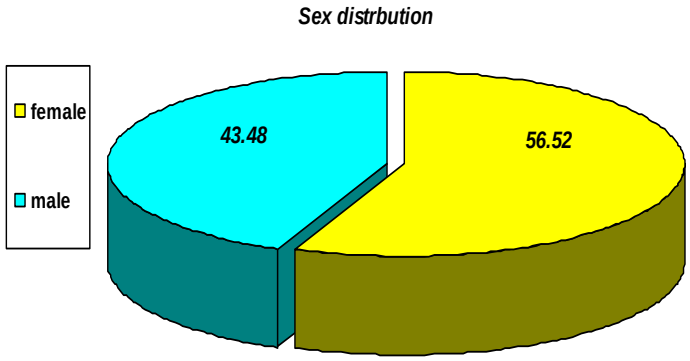


2-Sex distribution

In this study it was noticed that sex distribution was as follows:

-Female patient 13 patient 56.52 %

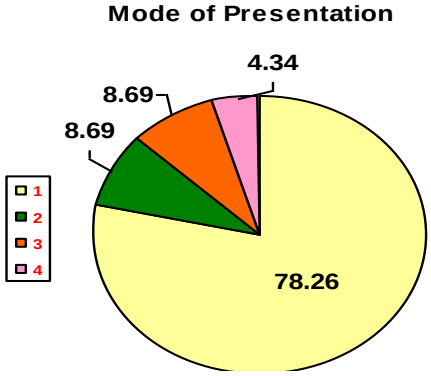
- 10 patient 43.48 % Male patient



3- Mode of presentation

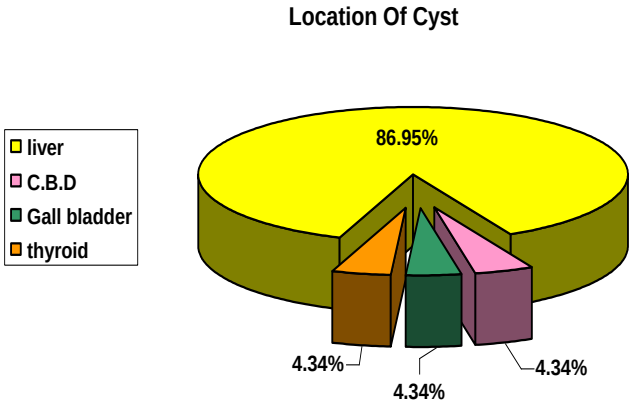
Four types of presentation of the disease were observed in this study and presented as follows:

	%	No.
(1) Asymptomatic	78.26	18
(2) Obstructive jaundice	8.69	2
(3) Accidental rupture	8.69	2
(4) Pressure symptom	4.34	1



4-Location of the cyst

	No. of patient	%
(1) liver	20	86.95
(2) C.B.D	1	4.34
(3) gall bladder	1	4.34
(4) thyroid	1	4.34



5- Investigation tools

	No. of patient	%
(1) u / s	15	65.22
(2) C.T	6	26.09
(3) C.T & u / s	2	8.69

6-Procedure

- Radical surgery: If the operation is feasible and its resection of the entire parasitic lesion from the affected organ is possible,surgery should be the first line of treatment of choice.
- Palliative surgery: If radical is impossible to relieve complication of the disease as (recent biliary obstruction with cholangitis ,septicemia, intrahepatic gall stones leading to secondary biliary cirrhosis).
- Consultation-neurosurgery , etc.

7-Histo pathological approval

100 % all cases proved to be Hydatid cyst disease by histo pathological examination, Surgical liver biopsy shows vesicles delineated by a periodic acid schif-postive laminated layer and surrounded by granulation infiltrate either in younger lesions or mostly fibro tic and cellular in the older lesions. Prostoscoleces are observed in 15% of the lesions from the centre to the periphery. The periparasitic granuloma is composed of epithelial cells, and various cells of the non immune response. Also collagen are present and other extra cellular matrix protein deposits. The granuloma is usually surrounded by lymphocytes in 100% of all cases proved to be hydatid cyst disease by histo pathological examination.

8- Ultra sound findings

Hypoechois mass with echogens septated liver,U/S should be used first. Line imaging technique calcified lesion appear with acoustic shadowing phenomenon . U/S has been done with diagnosis of hydatid cyst swelling in the right lobe of the thyroid gland. She operated with right hemithyroidectomy and discharged with a good condition on ABZ .

9-CT Scan

Abdominal CT scan confirms morphological aspect of the lesions.This is the best examination to how the typical

calcifications inside lesions which is difficult using U/S because of including shadow.

Abdominal CT scan also useful for operative evaluation to assess vascular involvement and extension to adjacent organs and tissues(eg Diaphragm, lungs, stomach, spleen ,Left kidney and adrenal gland.

Thoracic and cerebral CT scanning should be performed before any radical surgery especially liver transplantation.

10-Serological findings

Such tests confirms the diagnosis. Elisa with hydrologous antigen in E.granulosus cyst fluid is usually positive in 70%. Although Casoni skin test is not widely used because of its low sensitivity and specificity(Casoni was first discovered this test in the earliest last century in Libya)

11-Post-operative treatment

As we know no known drug for prophylaxis against echinoccosis exists. Although a vaccine prepared using a recombinant antigen protein has been successfully used to prevent larval infection by E granulosus insheep.

The potential efficacy of this vaccine in humans is questionable but may be considered in endemic areas.

So, diet regimen: Regular no special diet post operative except those with chronic cholestasis. All cases received complimentary antiparasitic chemotherapy post operative with benzinidazoles (eg. Mebendazole, Albendazole) at high doses.

1-Mebendazole(vermox) MBZ excreted in the urine and bile target MBZ concentration 4 hours after morning dose of average 250 nmol/L.

Adult dose 40-50 mg/kg./d po. Divided TID not to exceed 6 gtd. Administer preprandially / postprandially with a fatty meal. No established pedia dose more than 6 years.

Contrindication: Carbmazephine and phenytoin may decrease effects. Cimetidine may increase levels. Leucopenia is an absolute indication for terminating therapy because severe granulocytopenia is possible. Monitor leucocyte count every 2 weeks for 3 months. Then regular MBZ replaced by ABZ and vice versa was proposed in some cases and tolerated.

2-Albendazole(ABZ) It is recommended for severe cases with multiple locations and in patients with immunosuppression.

Adult dose 400mg po (10-15 mg/kg/day). A sulfocide metabolite (asox) levels estimated to be 650-3000 nmol.l. No estabkished dose in pediatric more than 6 year.

Interactions: Carbamazepine may decrease efficacy. Docamethazon, Cimetidine, Praziquantel may increase toxicity.

Precaution: Leukopenia and thrombocy-topenia have occurred so leukocyte count every 2 weeks for 3 mos. Then, every 3 mos. Thereafter. Complimentary chemot-herapy is mandatory for at least 2 yrs. Following surgery. According to the 1996 WHO informal working group on echinococcosis with careful follow up years. All cases received Albendazole tablet (therapy) post operative with CBC control. The result of surgical treatment are excellent without morbidity or mortality except one case developed biliary fistula.

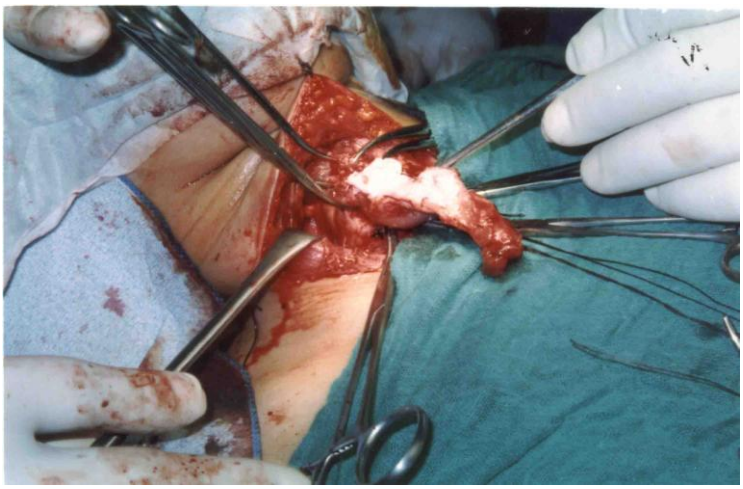
EXAMPLE OF Some cases :

A- Female patient aged 30 years from Algmeil , housewife married had three children presented with neck swelling in the thyroid gland which give pressure symptoms dysphagia dyspnea , change of voice , she had past history of hydatid disease affection of lung and liver 2 years ago which had and treated in Tripoli hospital. been don

U/S has been done with diagnosis of hydatid cystic swelling in the right lobe of thyroid gland . She operated upon with Rt hemethyroidectomy .

She discharged in good condition and on Elbendazol tablet theropy

(The indication of Surgery was pressure symptoms and for cosmetic reason)



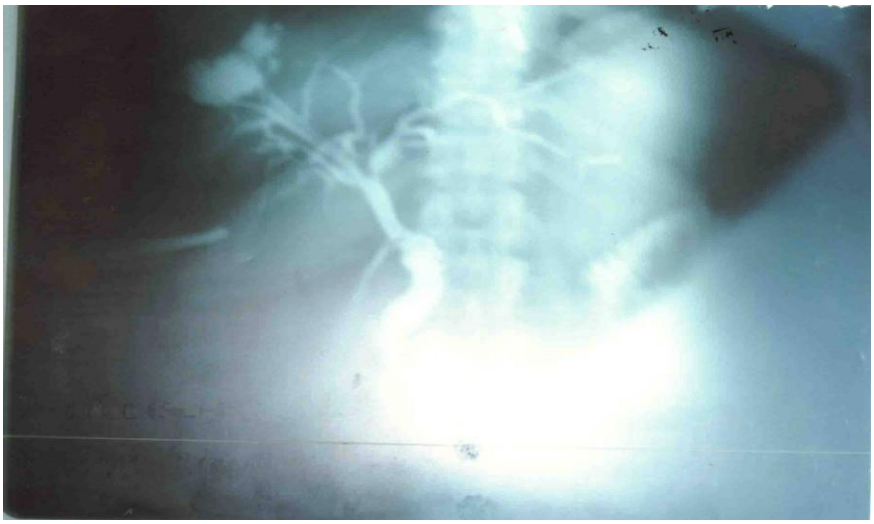
B- Female patient aged 40 years , from Zolton , housewife, married had 4 children presented with obstructive jaundice ,investigated by U/S and C.T. abdomen which prove the presence of 2 cystic swelling in right lobe of liver and multiple gall bladder stones and C.B.D dilation.

She was operated choleystectomy and exploration of C.B.D which was obstructed by many daughter cyst (Hydatid).

Intra operative cholergeography had been done which showed connection between C.B.D and right lobe of liver by 2 calcified hydatid cysts.

Histo pathalogical examination proved the diagnosis, the procedure was done choleduco duodenstomy. Post operative period passed smooth.

The patient has been discharged in good condition and on Al bendazol tablet



Discussion and conclusion

Control programmes have been carried out successfully in several countries, including Australia (Tasmania), New Zealand, Cyprus and the Falkland Islands, where *E. granulosus* is maintained through a domestic cycle involving dogs and sheep *(Gemmell and Lawson, 1986)*. Other countries are planning to institute similar control programmes.

In spite of the progress in these areas, echinococcus/ hydatidosis remains a serious public health problem in a number of countries. It is very important to support and implement new control programmes so as to prevent further spread of the disease. Research in possible vaccines is essential in order to supplement the existing methods of breaking the Echinococcus life cycle. Both WHO and FAO are interested in collaborating with national governments in developing national or regional control programmes.

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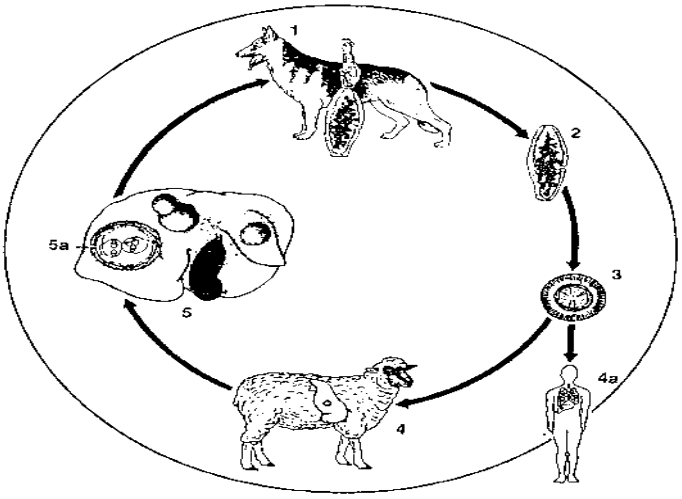
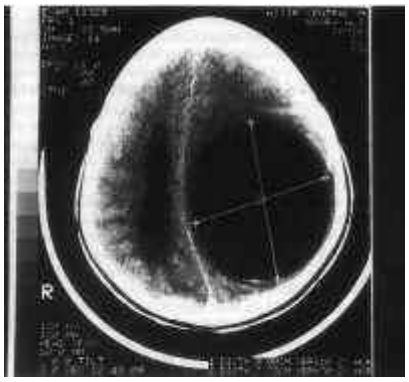
APPENDIX

SOME HISTORICAL CASES OF (ECHINOCCOSIS)

Life cycle





Hydatid cyst in the brain

Hydatid cyst in the lower pole of the spleen

Hydatid cyst in the liver and kidney

Hydatid cyst in the left iliac fossa

Hydatid cyst forming multilocular swelling in the region of the stomach and pancreas

(Cited by S.A. ABU-ESHY *King Saud University College of Medicine, Abba, Kingdom of Saudi Arabia*)

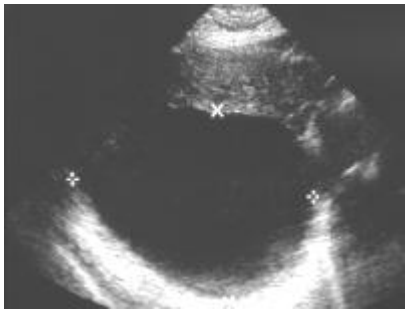
Computed tomogram of liver showing a multiseptated cystic mass almost completely replacing right lobe of liver.

Computed tomogram of liver showing that right lobe of liver is replaced by the cystic mass; there is also involvement of left lobe.

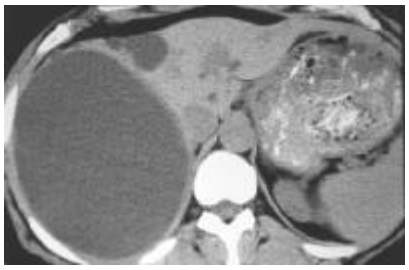
Cited by M J Kumar[1], K Toe[1] and R D Banerjee[2]

[1] Tameside General Hospital, Ashton under Lyne

[2] Whiston Hospital, Merseyside

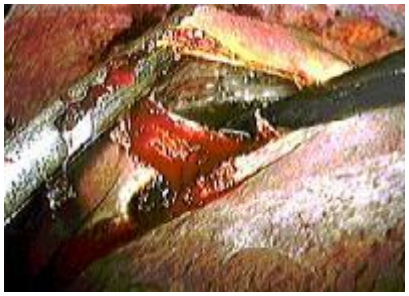


Ultrasound appearance of a patient with a large simple hepatic cyst.

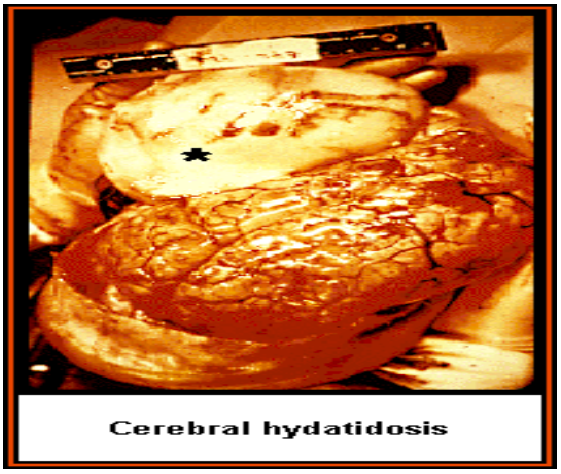


CT scan appearance of a large hepatic cyst.

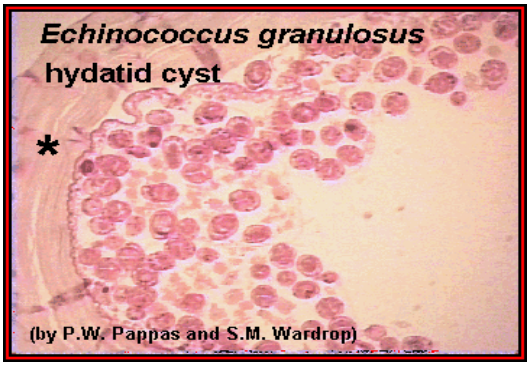
This is a laparoscopic view of the initial hepatic cyst puncture before unroofing. The lesion is located high in the right lobe of the liver near the diaphragm.



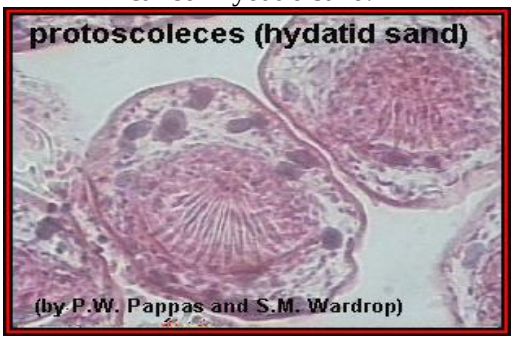
Laparoscopic view of the beginning of unroofing a large simple hepatic cyst near the dome of the right lobe of the liver.



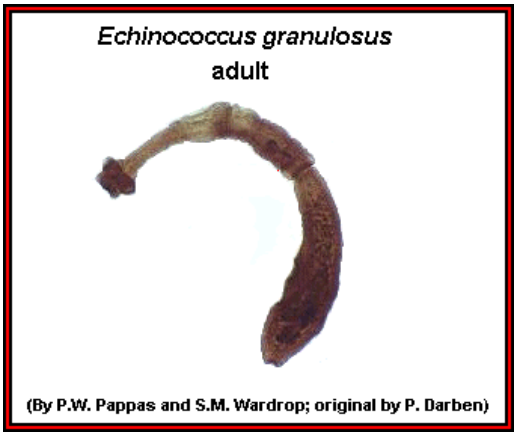
hydatid cyst (*) in the cranium of a child (the ruler at the top measures 6 inches long, and the child's brain is below the hydatid cyst). This infection resulted in the child's death.



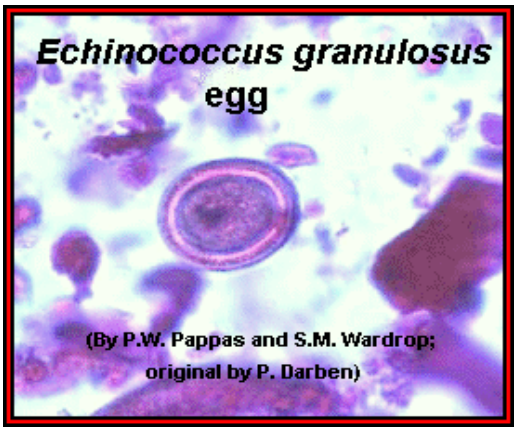
A section of a hydatid cyst at low power. The cyst consists of a thick outer layer (*), several thinner internal layers, and many protoscolices. The protoscolices are often called "hydatid sand."



A single protoscolex. Note the "hooks" that will form the hooks associated with the adult worm's armed rostellum



An adult *Echinococcus granulosus*; note that the tapeworm's body (strobila) consists of only three proglottids and measures only about 5 mm in length.



An egg of *Echinococcus granulosus*; these eggs are virtually indistinguishable from other, closely related species of tapeworms such as *Taenia*.

Echinococcus granulosus (the small, white objects) in the small intestine of a dog. Although these tapeworms are quite small, a single dog can be infected with many of them. (Original image from F. Rochette, 1999, *Dog Parasites and Their Control*, Janssen Animal Health, B.V.B.A. and used with permission.)

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تقييم حالات الأكياس المائية (هيدادت) فى مستشفى الجميل بالجماهيريه الليبية خلال عامى 2002- 2003

عبد الحكيم سالم رزيق
أستاذ الجراحة المساعد – مستشفى الجميل – ليبيا

تمت هذه الدراسه على عدد ثلاثة وعشرون مريضا من المترددين على مستشفى الجميل بالجماهيريه، حيث كان منهم ثلاثه عشر من الأناث وعشر من الذكور. وذلك خلال عامى 2002 ،2003. وقد تم التعامل مع الحالات بمختلف الطرق التشخيصيه والعلاجيه المختلفه. وقد دلت النتائج أن هناك أربع أنواع مختلفه من هذا المرض ويصيب عددا من الأعضاء الختلفه من الجسم خاصة الكبد والرئتين وأعضاء أخرى. وقد أختلفت الطرق التى تم بها إكتشاف المرض من حالات بلا أعراض إلى حالات أخرى تميزت بوجود إنسداد صفراوى وكذلك حالات إنفجار مفاجئ وبعض الحالات بأعراض ضغط على الأعضاء المجاورة.

وتوصى هذه الدراسه على وضع البرامج المناسبه للتحكم فى هذا المرض للحد من نسبه إنتشاره وتقليل نسبه المضاعفات التى يمكن أن يصاب بها المريض.