HYDATID DISEASE OF THE LIVER
WITH SPECIAL REFERENCE TO ITS SURGICAL TREATMENT.

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by

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Introduction.

Hydatid disease of the liver is a disease only encountered in Great Britain with great rarity, and when one has the opportunity of seeing a few cases it will be found that the study of the clinical features and treatment of this disease form an interesting pursuit.

The author has been working at a British Medical and Surgical Clinique at Huelva, Spain, and whilst so doing was impressed by the frequency with which cases of hydatid cysts occurred in Southern Spain. On consulting the case records of the clinique of several previous years it was found that many cases of hydatid disease had been submitted to operation. For example, in the year 1920 there were 8 cases of hydatid disease operated on, out of 116 major operations. The average number of these cases operated on each year is 3; this average being estimated from the records of the past ten successive years. Very probably many cases of hydatid disease unrecognised during life would be revealed at post mortem examinations. But unfortunately it is practically impossible to obtain permission from the Spaniards to perform an autopsy.

On looking into the geographical distribution of this malady its frequent occurrence in Spain does not appear to have been noted. So it is the aim of this thesis to present an/
an account of hydatid disease affecting the liver, the most commonly affected organ, with special regard to its occurrence in Spain, and to describe the treatment adopted in a series of cases treated at La Clínica, Huelva.
Description of Adult Worm.

The Taenia Echinococcus is the smallest cestode known, measuring about 4 or 5 millimetres (about a quarter of an inch in length, and 5 mm. in breadth. The adult worm has a head with four suckers, a rostellum and a double crown of hooklets. Behind this there are 3 segments, the last of which is the largest and contains hundreds of eggs which may become transformed later on into the hexacanth embryos, so called because of each having 6 hooklets at one extremity, thus enabling it to anchor on the intestinal mucous membrane of its habitual host. This last segment becomes detached and passes out with the excreta of its host. Meanwhile, to compensate for this cast off portion, segmentation occurs in the cervical region, and so the process repeats itself.

The adult worm does not inhabit man who forms the intermediate host, as does also the sheep. The most commonly known host for the adult worm is the dog. In addition to these the Taenia Echinococcus is reported to have been observed also in monkeys, goats, cows, horses, asses, camels, hogs, squirrels, and kangaroos.

(Drawing of Adult Worm: See over.)
1. Drawing of Adult Worm (10 times enlargement).
2. Magnification of the hooklets.
Life History of the Taenia Echinococcus.

The echinococcus is transmitted to man and domestic animals by the dog which harbours the adult worm and disseminates the eggs with its excreta. These eggs may fall on food substances, such as herbage, vegetables, fruit, etc., and drinking water may also become polluted.

The following is a schematic representation of the method of passage of infection from (1) sheep to dog, and (2) from dog to sheep or man.
The ovum is swallowed by man, the shell digested and the small six-hooked embryo, which is thus set free, makes its way into the intestinal wall, reaches the circulation and is then carried passively to some organ, commonly the liver. Having reached its destination it loses its hooklets and becomes transformed into a cyst. It is to the production of these cysts that the term hydatid or echinococcus disease is given. The word "hydatid" is derived from the Greek word meaning "vesicle of water." "Echinococcus" is also of Greek Derivation and means "hedgehog" or "berry."

Thus is the life cycle of the echinococcus and the more one thinks about the origin of hydatid disease the more is one reminded of the old question - "whether did the hen originate from the egg or the egg from the hen?"

Life History.

Description of the Cyst.

The cyst wall consists of (a) an outer layer, (the ectocyst) which is laminated in structure, and (b) an inner layer (the endocyst) which is parenchymatous and granular. Later this cyst becomes surrounded by a capsule of fibrous tissue derived from the tissues of the host. This is the structure in which the larval worm is embedded. The cyst contains fluid, the characters of which will be described later.

3 varieties of echinococcus are recognised:-

(1)/
Development of the *Echinococcus* & the Cyst.

Reproduction may occur in three different ways:

I. The inner parenchymatous layer develops smaller secondary cysts which remain attached by a pedicle and in which are formed "scolices." These "scolices" resemble the heads of adult worms. The foremost part of the scolex can be withdrawn into the hindermost part and in this position the scolex is usually seen. The secondary cysts are named "brood capsules" and have an inner cuticular and an outer granular layer.

II. The original cyst produces daughter cysts either directly from the brood capsules or between the two layers of the cyst wall. These daughter cysts have the same structure as the mother cyst and may give rise to grand-daughter cysts.

III. Exogenous cyst formation: Daughter cysts formed between the ectocyst and endocyst, may be discharged externally into the neighbouring organs. This method is more common in animals but is sometimes found in human bones.

The Multilocular cyst is the term given when the cysts have a number of cavities separated by fibrous strands.

Changes in the Cyst.

The cyst after a long and progressive period of growth may remain stationary. The parasite may die and the fluid contained...
contained in the cyst becomes albuminous. The pouch retracts and around it the hepatic parenchyma becomes deformed. This involution may be so marked as to leave a cicatrix.

Calcification may occur in the cyst or the cyst may ultimately rupture into the peritoneum or into a neighbouring organ. Another change in hydatid cysts is suppuration. When this occurs, the fluid which is contained in the cyst is always found to be albuminous. Suppuration does not prevent the vesicles contained in the cyst and even the scolices from retaining the vitality. The most common organisms causing suppuration are the Bacillus Coli and the Streptococcus. Anaerobic organisms are seldom found to be responsible for suppurative changes in the cyst. The infection may arise from the adjacent intestine or it may be subsequent to a necrosis in the cyst. Most frequently the infection is of biliary origin. Following on suppuration, adhesions between the cyst and neighbouring organs are commonly found.

Geographical distribution of the Echinococcus.

Geographically Hydatid disease has a wide distribution which corresponds with that of the dog. In some regions it is more frequently met with than in others. It occurs with extreme frequency in Iceland and is a very well known disease in Australia and parts of South America, particularly Argentine and Uruguay. It is common in Spain, and in the provinces of Normandy, Landes, and Tunisia in France, in addition to Mecklenburg and Pomerania in Germany. It is very rarely seen in Great Britain and/...
In Spain all the cases seen at La Clinica, Huelva, have been Spaniards, chiefly of the poorer class, who have been connected with labouring in the country districts. Nearly all have had dogs living in their houses. In addition it was commonly found that these people frequently drank in the great heat of summer from clear running streams round which animals had been pasturing. They also eat considerable quantities of such uncooked foods as lettuce, etc.

Distribution in the Body.

Hydatids may occur in almost any organ in the human body but with greater frequency in some organs than in others. When statistics from all sources are compared, one is struck by the relatively greater frequency with which the disease manifests itself in the liver. Whilst in other organs such as the thyroid gland and spinal cord the occurrence is very rare. In addition to the above organs, the following have been found to have been the seat of Hydatid Disease:—Kidney, Lung, Spleen, Bones, Suprarenal capsule, Cerebrum, Cerebellum, Heart, Breast, Etc.

In Spain the greater frequency with which Hydatid disease has occurred in the liver as compared to other organs is shown by the following statistics:—

At the General Hospital, Madrid, from a series of 73 operations for Hydatid disease:
were liver cases
3 spleen
2 lung
1 kidney
1 cellular tissue of thigh
1 sterno mastoid muscle.

At La Clinica, Huelva, the following table shows the relatively frequent occurrence of the disease in the liver:

<table>
<thead>
<tr>
<th>Organ</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>51</td>
</tr>
<tr>
<td>Spleen</td>
<td>4</td>
</tr>
<tr>
<td>Omentum</td>
<td>3</td>
</tr>
<tr>
<td>Lung</td>
<td>3</td>
</tr>
<tr>
<td>Kidney</td>
<td>2</td>
</tr>
<tr>
<td>Sartorius muscle</td>
<td>1</td>
</tr>
<tr>
<td>Breast</td>
<td>1</td>
</tr>
<tr>
<td>Pancreas</td>
<td>1</td>
</tr>
</tbody>
</table>

Out of a series of 66 consecutive cases.

III. Symptomatology & Diagnosis of Hydatid disease of the Liver.

Symptoms and Signs:

The Hydatid cyst may develop very insidiously at the beginning and the diagnosis is then frequently impossible until it becomes sufficiently large to be appreciated by palpations. Therefore there are two stages:

(1) The early stage
(2) The stage when there is a tumour.
(1) The early stage.

Here the presence of Hydatid disease of the liver may be suspected by the presence of certain features well described by Professor Dieulafoy. They are pain in the right shoulder, urticaria, right sided pleurisy with little effusion, the occurrence of a dislike for fatty foods. To these we may add painful sensations in the right hypochondrium and the epigastrium, gastro-intestinal disturbances such as dyspepsia and diarrhoea, repeated mucous haemorrhages such as epistaxis, etc., and the fact that the person is living or has lived in a country where hydatid disease is common.

(2) The stage when there is a tumour.

The phenomena found will depend on the situation of the cyst in the liver. In the case of cysts in the anterior part of the liver the tumour may project into the epigastrium or right hypochondrium under the costal margin which becomes more or less pushed out. In palpation - It is a smooth, regular, and circumscribed tumour continuous with the liver and moves with it on deep respiration. Its consistence is firm and elastic, rarely fluctuating.

In Percussion - The note is dull. The "hydatid thrill" may occasionally be detected. This is elicited by placing one hand over a part of the tumour and lightly tapping another part of the cyst with the fingers of the other hand, when a vibrating thrill will be felt by the first hand. This sign is neither pathognomonic/
pathognomonic nor constant. It may be got with any thin-walled cyst containing a fluid about the density of water. Obecure pains may be complained of, and dyspnoea may be present.

**Hydatids at the upper portion of the Liver** may cause an enlargement at the base of the thorax to the right side and evidence may be obtained by percussion or by a skilogram etc. of a dome-shaped tumour continuous with the liver.

**Hydatids at the Anterior Inferior part of the Liver** may be pedunculated and will be found to move with the liver on deep inspiration. Signs of compression of the bile passages or portal vein may occur (Jaundice, ascites). One case of pressure on the pyloris occurred resembling pyloric stenosis.

In the case of the cyst at the Posterior-Inferior part of the Liver the tumour develops in the lumbar region, presents lumbar contact, but only rarely does it give the sign of renal ballottment.

**Evolution of the cyst and complications.**

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**Increase in Volume.**

Some Hydatids of the Liver grow to an enormous size and may fill a great part of the abdominal cavity. Such a case shows further general disturbances such as weakness, wasting, pigmentation and dryness of the skin. As the cyst increases it compresses neighbouring organs and may rupture into them. If the cyst grows/
Tends towards the thorax compression signs and symptoms may be manifested, such as hiccough, followed pleuritic cough and pleural effusion and later we may have signs of a basal pneumonia.

Rupture.

These features may remain unperceived until perhaps there occurs a sudden vomiting, followed by expectoration containing hydatid debris, more or less mixed with blood or muco pus, indicating rupture into the thorax. Rupture into the pleura frequently leads to a purulent pleurisy.

Rupture into the Abdomen.

A rupture into the peritoneal cavity commonly follows traumatisms. Then the patient feels as if something had given way; there is a tendency to syncope and vomiting and after a variable time there will be generalised urticaria. These are the most frequent signs but sometimes they pass almost unperceived. On the other hand, death may occur suddenly or after some hours from the syncope, haemorrhage, or intoxication. If the cyst is suppured when rupture occurs the peritonitis is fatal. A septic peritonitis may, however, follow on a biliary infection. Finally the rupture may give rise to a diffuse secondary echinococcal infection of the peritoneum in which case the latter is found to be studded with tiny hydatid cysts.

Rupture/
Rupture into the stomach produces vomiting of hydatid elements whilst with rupture into the intestine they are expelled with the faeces and then it is common to have the history of having passed material described as "empty grape skins." Rupture into the biliary passages causes acute biliary symptoms. Rupture into the vena cava would cause rapid death from embolism.

Suppuration.

Suppuration may precede rupture and is a serious complication characterised by the following main symptoms: Pain and tenderness in the cyst, increase in size of cyst, fever, and disturbance in the patient's general condition. These signs are also got with liver abscess. Sometimes there is a resonant note on percussion over the suppurating cyst indicating infection by anaerobic microbes. Sometimes suppuration remains latent and the diagnosis of the complication is not made until operation.

Diagnosis.

The early stages of hydatid disease of the liver are very difficult to detect, but the diagnosis is often easy when marked physical signs with a comparative absence of symptoms are found in a subject living in a country where the disease is common. However, the diagnosis is sometimes very obscure.

Several procedures have been devised as aids to the diagnosis such as blood examination, X-rays, and serum reactions, but many of these are of little value as the absence of a positive result does not exclude the presence of hydatid disease.
Exploratory puncture:

should be condemned as a dangerous proceeding. It may be followed by suppuration in the cyst or by the spread of echinococcal infection to regions outside the cyst. Even sudden death is reported to be a risk.

Eosinophilia:

A moderate eosinophilia about 5% is a presumptive sign, but at the same time a very inconsistent one and many other conditions apart from hydatid disease also produce an eosinophilia, such as different parasitic affections, sarcoma, etc.

X-rays:

may reveal a round shadow continuous with the liver and this is an important sign of presumption.

Serum reactions:

Many different reactions are stated to occur, but they all have disadvantages, the chief one being inconstancy.

(1) "Precipitate Reaction of Fleigh and Lisbonne": The Blood serum of a patient with hydatid disease when mixed with some hydatid fluid may give a precipitate after about 20 hours. This is not positive in one-third of the cases and it may be produced with the serum of healthy subjects.

(2) Casoni's intradermal reaction: The intradermal injection of 0.5 c.cm. of clear hydatid fluid obtained from the ox or sheep causes within a few hours' time, at the site of the inoculation, erythema/
erythema, pruritus, local rise of temperature and oedema. The objection to this is that a negative result is got in cases where there is thickening or calcification of the cyst wall, or suppuration in the cyst.

(3) Reaction of Weinberg and Paron: This is based on the principles of the Bordet-Gengou reaction and is acknowledged to be more reliable than the other serum tests. It is briefly as follows:-

Mix hydatid fluid from the sheep
plus blood serum from the suspected case
plus 0.9% saline.

Keep this mixture for one hour at 37°C.

Then add red blood corpuscles of a sheep and in 1½ hours if there is haemolysis the result is negative. If no haemolysis the result is positive - there is hydatid cystic disease.

When there is a negative result a slower method is adopted in which the serum of a guinea pig is used as a control.

Differential Diagnosis:

Hydatid disease of the liver may be confused with other causes of enlarged liver, such as cancer, syphilis, abscess of liver, and hypertrophic cirrhosis.

Cysts at the upper part of the liver may simulate pleurisy, hydatid of thorax at right base, or subphrenic abscess.

Cysts at the posteroinferior lobe must be diagnosed from renal/
renal tumour (cystic kidney, hydronephrosis, pyonephrosis).

**Cysts of the left lobe** must not be mistaken for tumours of the spleen or pancreas.

**A pendulous hydatid** of liver may be mistaken for a distended gall bladder.

**Cancer of liver:** Here the surface is irregular, tender and hard. Umbellicated nodules may be felt. Absence of elasticity or fluctuation. Course more rapid. Possibly signs of primary growth elsewhere.

**Syphilis of liver:** Seldom produces symptoms and if detected during life the discovery is usually accidental. Enlargement usually slight. Positive Wassermann and may be other signs of syphilis.

**Abscess of liver:** A suppurating hydatid may be confused with liver abscess but with hydatid disease there will be history of long standing, painless tumour having preceded the symptoms of abscess; absence of exposure to the ordinary causes of tropical abscess and no history of dysentery.

**Hypertrophic Cirrhosis:** Usually occurs in stunted children and is not a cystic tumour. Jaundice is an early and persistent symptom. The spleen is usually enlarged.

**Distended gall bladder:** may be recognised by shape and position. History of attacks of biliary colic preceding formation of tumour. Jaundice usually present.
If a hydatid ruptures into the bile duct, biliary colic and jaundice will occur.

**Extensive right sided pleural effusion:** Hydatid of liver is distinguished by its insidious growth and absence of constitutional symptoms. Chief point is that the upper margin of dulness is horizontal in pleural effusion whilst it is rounded in hydatid disease. Difficulty arises when both conditions co-exist.

**Renal tumour:** Never crosses the middle line. Always bulges forwards, never backwards and outwards. Always has bowel in front. Ballottement present. Not mobile with respiration.

**Buprarenal tumour:** Evidence of interference with the secretion of suprarenal extract.

**Ovarian Tumour:** Grows from below upwards. No movement on respiration.

Hydatid fluid has characteristic features: This is a clear or sometimes turbulent fluid of low specific gravity. It does not contain albumen unless suppuration has been present. Sodium Chloride is present (about 5 to 7 grams per litre) and sometimes succinic acid. Microscopically we may be able to demonstrate in the fluid the following, especially after centrifugation: - echinococccic scolices, brood capsules, booklets, and the laminated remains of the membranes. The booklets resemble in appearance the thorns off rose bushes.
HYDATID DISEASE OF THE LIVER.

I. PROPHYLAXIS.

In the treatment of hydatid disease little has been said with regard to prophylaxis, which is certainly worthy of consideration, especially in countries where the disease is very prevalent. Prophylaxis depends on a knowledge of the causes of the disease and various measures might be adopted. For example:

(1) The prevention of dogs from feeding on the offal of sheep and other animals infested with hydatid disease. Thus dogs ought to be excluded from slaughter houses and knackeries.

(2) Every attention ought to be given to the destruction of tape worms in dogs.

(3) People might be educated regarding the dangers of drinking unpotable water and of eating uncocked vegetables such as lettuce, etc., from an unreliable source.

II. MEDICINES.

Formerly various medicines, such as Iodine, Potassium iodide, Kamala, etc., were given internally with hopes of their killing the parasite. Such treatment is absolutely useless and is not now/
new practised.

III. **SURGICAL TREATMENT**.

The following methods were formerly practised in the surgical treatment of hydatid disease of the liver:

1. Electrolysis.
2. Simple puncture of the cyst.
3. Simple aspiration of the contents.
4. Aspiration and injection of parasitic substances, such as Baccelli's method, in which he evacuated about 10 grammes of fluid and replaced it by an equal volume of a corrosive sublimate solution containing from 1 to 5 centigrammes ($\frac{1}{6}$ to 1 grain).
5. Perforation of the parietal wall and cyst wall by caustic or the cautery.

All the preceding have been found to be more dangerous than beneficial, exposing the patient to the accidents following puncture already referred to.

At the present time the only method to be advocated is that of Laparotomy followed by one or other of the methods of dealing with the cyst.

The methods of dealing with the cyst are:

1. Incision and drainage, in one or two stages.
2. Total enucleation of the cyst and closure of the wound.

1. **Incision and drainage in 1 or 2 stages.**

The term "marsupialisation" was given to the evacuation of/
of a hydatid cyst, leaving a drainage externally, thus converting
the cyst into a pouch. This operation invented by Recamier,
was carried out by Begin in 1830 and revived by Volkman in
1877. These surgeons did the operation in two stages.
Lindeman and then Landau did the operation in one stage. After
this the operation became popular. The following is the
technique of the method by incision and drainage in one stage.

An incision is made over the most prominent part of the
tumour. The incision is usually vertical when the tumour is
an anterior one. After opening the peritoneal cavity and
exploring the extent of the tumour, great care is taken to
protect the peritoneal cavity by using gauze swabs. These
are carefully packed between the liver and abdominal wall. Then
the edges of the incision are covered by large swabs to
prevent the soiling of the cut edges by contact with escaping
fluid.

A large aspirating needle is introduced into the cyst in
order to drain away as much as possible of the fluid. By the
side of the needle an incision is now made through the cyst
wall and the needle is withdrawn. The index finger is used
to hook forward the cut edges to which a clip may be attached
so that forward traction may be made on the cyst with a view
to the avoidance of any trickling of fluid therefrom. The index
finger, or the whole hand in the case of a large cyst, is passed
round the cavity and the daughter cysts removed as thoroughly as
possible. An attempt may now be carefully and gently made to
detach/
detach the mother cyst. Occasionally this may be easy but most frequently it is very adherent and its removal will then be impossible.

The cyst having been emptied as far as possible its cavity is packed with one or more rolls of sterile gauze to prevent leakage whilst the liver is sutured to the abdominal wall. A few interrupted catgut sutures are passed through the cut edges of the liver and the parietal peritoneum and the muscles or fascia outside it. As these stitches are passed, the gauze protective packs used early in the operation are one by one removed. Then the gauze packing in the cyst may be removed and a large glass, or rubber drainage tube inserted, using in addition a gauze drain especially if there is haemorrhage. The wound in the abdominal wall may be narrowed by one or more sutures above or below. The subsequent discharge from the wound is always bile stained and is less profuse during the first twenty-four hours. At each daily dressing of the wound a free irrigation with sterile salt solution or mild antiseptic solution may be applied and the drainage renewed, and this procedure continued until the discharge becomes slight.

Incision and drainage in two stages.

The procedure is exactly similar to the above until the liver is exposed. Then the exposed surface of the liver is stitched all round to the parietal peritoneum, thus ensuring accurate apposition between the two serous surfaces. The wound is now packed with gauze for three or four days. After removal/
removal of the gauze adhesions will be found to have formed
all round, thus shutting off the exposed liver surface from
the peritoneal cavity. The cyst is now incised and its con-
tents evacuated in the manner already described.

The operation of incision and evacuation of the cyst
contents followed by complete closure of the incision with
no drainage is not to be recommended as we have found
recurrence to have followed such technique in spite of what appeared
to be thorough evacuation of the cyst contents. In addition
suppuration in the cyst is an absolute contra-indication to the
operation.

2. Enucleation.

Here the entire cyst is enucleated, the opening in the
liver sutured and the abdominal wound closed without drainage. 
Knowsley Thornton first tried this operation in 1883. Then
Bond adopted the method in 1891 and Debbet advocated it in
1896.

The abdomen is opened, the cyst exposed, tapped, incised
and emptied in the manner already described. The endocyst is
now separated carefully and gently and withdrawn away from
the ectocyst. As soon as it is removed the whole of the in-
terior of the cavity is gently dried with gauze. The cavity
if small may be suppressed by passing a series of sutures with
a Hagedorn needle. The edges of the liver wound are now sutured
together, but not to the abdominal wall. All swabs are removed
from/
from the peritoneal cavity and the abdominal incision is then closed.

The method employed here in Huelva is that of incision and drainage, the operation being always done in one stage. If it is possible to removed the entire cyst this is done but few of the large number of cases met with were amenable to this procedure owing to considerable adherence being present. The drainage consists of a packing by a long strip of iodoform gauze if the cyst is suppurating, or of plain sterile gauze if the cyst is not suppurating. In the centre of this is inserted a large glass drainage tube. After the operation the dressing is changed daily, the gauze and tube being removed, the cyst wiped round with gauze held in forceps, thus drying the cyst and evacuating small daughter cysts which may have remained in the cavity. No irrigation of the cyst is carried out. As the discharge becomes less abundant a smaller tube may be periodically substituted for the larger one. As the cyst becomes dry and its walls show shrinkage, the use of the tube and gauze is abandoned and the remaining opening allowed to heal up. Should a small fistula persist here, which seldom happens, its healing is hastened by touching the edges with pure carbolic acid. We must vary our incision according to the position of the cyst in the liver, thus in the case of a posterior inferior cyst projecting between the last rib and the crest of the ilium, we would use a lumbar incision.
incision. With a posterior superior cyst a part of one or two ribs, usually the 8th or 9th, is resected and access to the cyst obtained by an incision through the diaphragm either going through or below the pleura. In such a case it is advisable to shut off the pleural cavity by stitching the fibres of the diaphragm to the upper edge of the wound. This operation is also done in one stage.

In the case of a pedunculated hydatid cyst the pedicle may be divided and the stump ligatured, then fixed in a part of the wound so that a gauze strand may be passed into it for drainage purposes.

Some surgeons prior to incising the cyst inject into it some parasiticide substance such as 1% formalin, and allow it to remain for five or ten minutes.

Regarding the complications rupture of a suppurating hydatid into the peritoneum would necessitate laparotomy and drainage of the peritoneal cavity as well as attention to the cyst itself. Rupture into the bile passages requires laparotomy with attention to the cyst and drainage of the bile passage. Rupture into the thorax indicates the trans-thoracic route in approaching the seat of trouble.

SUMMARY AND CONCLUSIONS.

In this thesis the frequency of hydatid disease in Spain is referred to. This does not appear to have been previously noted/
noted. The clinical features of the disease indicate its slow and progressive character so that it usually does not appear before the medical man until well advanced. As observed also in other countries, hydatid disease in Spain manifests itself with greatest frequency in the liver as compared with other organs. Where hydatid disease is prevalent we are justified in regarding many of the cases with a gravity such as would be attached to the well known scourges, cancer and tuberculosis. With reference to the diagnosis of this condition, we contend that it is possible to make a diagnosis as accurately on the general clinical features without the accessory methods such as serum reactions, etc., as with them. Therefore as a result of this experience in Huelva we disregard them. Under the treatment of hydatid disease attention is drawn to the prophylactic measures considered of value, and to the uselessness of treatment by internal medication, and by certain of the surgical measures, namely, methods of puncture, aspiration, aspiration with injection of medicaments, cautery or electrolysis. The present-day methods to be practised are incision with drainage, and total enucleation of the cyst if possible. In Huelva the operation most frequently performed is that described under "incision and drainage in 1 stage." The reason for this is the frequency with which it has been found impossible/
impossible to remove the cyst entirely. Also without drainage we hold that recurrence is more apt to arise, and should suppuration occur the wound must be re-opened. The operation is always done in one stage even with the trans-thorax route to the liver as sufficient protection from spread of the infection can be obtained by the means above indicated. The two, chief drawbacks urged against the method of "incision and drainage" are:-

(1) Prolonged convalescence.
(2) Liability to cicatricial hernia.

(1) The convalescence is frequently a long one, some of the cases continuing to discharge during a period of from 6 to 10 weeks. If suppuration is present the after treatment will naturally last longer than if there is no suppuration.

(2) With regard to subsequent occurrence of a hernia, this can be considered as rare, in spite of the large drainage. As only one such case is on record out of the many cases treated by Mackay during a period of about forty years in Spain.

The method of enucleation has also been practised in this clinique but in a very much smaller number of cases than the method of incision and drainage.

Of the cases treated at Huelva the mortality has been very small. Thus out of a series of 65 operations for hydatid disease 5 deaths occurred, 4 being liver cases and 1 being a lung case. The last mentioned was complicated by tuberculosis of/
of the lungs. The 4 liver cases when first seen were in an advanced state of prostration from suppurating hydatids. One of these cases was seen 10 months after operation with extensive spread of the disease to the peritoneum, so much so that intervention was considered inadvisable and death occurred 4 days later. This gives a mortality rate of 7.6%. 33 consecutive cases of the 65 were without fatality.

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### APPENDIX.

Short Tabulation of a few of the cases of Hydatid Disease treated at Huelva.

<table>
<thead>
<tr>
<th>No.</th>
<th>Sex</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Brief points taken from the Clinical notes</th>
<th>Result &amp; Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>M.</td>
<td>55</td>
<td>Hydatid disease of liver causing vomiting occurring about pyloric obstruction.</td>
<td>History of several months of epigastric pain and vomiting occurring about 3 hours after food. Pain was relieved by taking food &amp; vomiting. Patient had been taking sod. bi-carbonate which gave some relief. Vomit contained free HCL &amp; bile. No blood &amp; melena. Visible peristalsis present in stomach. No tumour seen nor palpated. Case diagnosed as pyloric obstruction due to old duodenal ulcer. Treated by total enucleation of cyst, about size of small orange, found growing from antero-inferior part of liver. Stomach, Duodenum &amp; Gall-bladder found healthy.</td>
<td>Cured after uneventful recovery.</td>
</tr>
<tr>
<td>2.</td>
<td>F.</td>
<td>24</td>
<td>Suppurating Hydatid of Liver.</td>
<td>Patient admitted with tense tender swelling situated in the epigastrium continuous with the liver and apparently containing gas. Sudden onset 15 days previously with &quot;pain in stomach&quot; and vomiting. History of fever daily during this time. On admission temperature 101.5, pulse 110. The symptoms were less acute than those occurring in acute gall bladder conditions and the swelling did not resemble a swelling of the gall bladder. Treated by incision &amp; drainage of the suppurating hydatid cyst.</td>
<td>Cured. Temperature kept up for 9 days and then ran a normal course.</td>
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<tr>
<td>No.</td>
<td>Sex</td>
<td>Age</td>
<td>Diagnosis</td>
<td>Brief points taken from the clinical notes</td>
<td>Result &amp; Remarks</td>
</tr>
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<td>3.</td>
<td>F.</td>
<td>26.</td>
<td>Suppurating Hydatid of Liver</td>
<td>For 3 years has had attacks of fever almost continually &amp; accompanied by obscure pain in upper right part of abdomen. No digestive complaints but developed distinct dislike for fatty foods and meat. Loss of weight &amp; general weakness. One attack of Jaundice. History of urticaria. Palpable &amp; tender tumour continuous with the liver is found bulging from under costal margin in the right mammary line. Treatment: incision &amp; drainage in one stage.</td>
<td>Cured.</td>
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<tr>
<td>4.</td>
<td>M.</td>
<td>46.</td>
<td>Hydatid of Liver</td>
<td>History of discomfort referred to epigastrum for 15 years. First patient discovered swelling in epigastrum 3 months prior to admission. This then became painful. Occasional vomiting during last month but this had no relation to food. A regular tense, tender and fluctuating tumour was seen &amp; felt in the epigastrum and moved with respirations. A non-expansile pulsation synchronous with heart beat was present. Slight rise of temperature was present. Several Drs. previously had diagnosed &quot;aortic aneurism.&quot; No bruit was to be heard over tumour &amp; blood pressure was normal. Treated by incision &amp; drainage in one stage.</td>
<td>Cured.</td>
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<td>5.</td>
<td>F.</td>
<td>46.</td>
<td>Hydatid abscess of Liver</td>
<td>For 4 months before admission patient suffered from discomfort in R. side over liver. One month later she noticed a bulging in R. side referred to space extending below the 5th rib/ (R.T.O.)</td>
<td>Cured after having discharged for 3½ months.</td>
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rib to costal margin just external to the right nipple line.
Family Dr. drew off a large quantity of pus with trocar.
Patient ran a swinging temperature & a discharge of pus continued in which were found pieces of hydatid cysts.
Treated by opening the abscess between 5th & 6th costal cartilages on R. side, irrigating the cavity with saline & inserting a drainage tube.

Typical history of suppurating hydatid of anterior inferior part of liver. Painless enlargement of spleen also found.
In the liver 3 separate cysts were found at lower anterior part. These were incised and drained. Hydatid of spleen also present but patient's condition did not allow of interference here.

Good result with the part dealt with but patient returned one year later with large hydatid at upper anterior part of liver causing outward displacement of heart apex beat. Condition of spleen much the same. No operative intervention owing to weak state of patient.