M.D. 1913

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HYDATID DISEASE IN WESTERN AUSTRALIA.

A Thesis for the M.D. Edinburgh.

Submitted by

SOMERVILLE BOULNOIS DAVIS,

M.B., C.M. Edinburgh 1890.

Medical Officer to York Hospital,

York, Western Australia.

INTRODUCTION.

Having been resident in Western Australia for the last 20 years, I propose in the present thesis to deal with Hydatid Disease, a condition which I have frequently been called upon to treat. In all I have operated upon over 100 cases of this disease during those years. In the early part of my experience my cases were chiefly among the Aborigines and it is a remarkable fact that nearly all in the Eastern district of Western Australia were sufferers from echinococcus disease in some form or other. Only those who actually suffered pain or inconvenience from the disease came to consult me but very frequently when I examined a native who came to consult me for some other condition I found that Hydatid disease was present in some shape or form. This remarkable frequency of the disease I can only explain as due to the habits of life of the natives. Since the advent of the white man they became possessed of a number of dogs and round their camps it was a common sight to see hordes of unhealthy looking dogs drinking out of the same water holes as the Aborigines. I might mention incidentally that Hydatid disease has been with the exception of measles and tuberculosis, and possibly syphilis, the greatest scourge to the Aborigines since these diseases were introduced. The life history of

the taenia Echinococcus has been fully worked out and I do not propose to touch upon this in my thesis. The pathology and general symptomatology is also outside the scope of this paper. I shall deal more particularly with the aspects of the disease as it is seen in Western Australia and will refer to several cases of considerable interest that have come under my personal care.

HISTORICAL.

It has long been known that Echinococcus disease is very common in some parts of Australia and various writers have referred to its prevalence especially in Victoria. In April 1861 R.F. Hudson, Resident Physician to the Melbourne Hospital, published a paper in the Australian Medical Journal. In this communication Hudson remarked that Hydatids were very common in Melbourne and he "ventured to predict that hydatids would become of frequent occurrence in Australia."

Subsequent experience has fully justified this prediction. In 1867 D.W. Lindesay Richardson made similar reference to the occurrence of the disease (Edinburgh Medical Journal, Dec. 1867) decade 1868-1877 (Lancet, March 1st 1879). Owing to the relatively smaller population the disease has not been so prevalent in Western Australia as in the other Colonies, and no deaths are recorded from this disease previous to 1882. That the disease is now comparatively frequent in this Colony is shown by my own experience. During my residence in this Colony from 1893 to 1913 I have had under my care a total of over 100 cases of Hydatid disease.

DISTRIBUTION OF HYDATID DISEASE.

Hydatid disease is of wide distribution occurring with greater or less frequency in almost all countries inhabited by Europeans or their immediate descendants. There is no record of the affection among races where Europeans have not dwelt. Although it is now frequent among the Aborigines of Australia it seems probable that the disease came to them in company with whisky and the other blessings of European civilisation. It is probable that wherever man and his faithful friend the dog are found together there will also be found with greater or less frequency Hydatid disease in the former. At the present time the frequency of echinococcus infection in man and the inferior animals varies much in different countries. In Germany, France, America, and British India the disease is comparatively rare. The Countries in which echinococcus is most prevalent are Iceland and Australia.

FREQUENCY.

In man the liver is by far the most common seat of hydatid disease for statistics show that this organ is invaded in 57% of all cases of echinococcus infection and when multiple hydatids are present, the liver usually harbours one or more of them.

Site. The right lobe of the liver is from five to six times the size of the left lobe. Under ordinary conditions it is natural therefore that it should be more frequently the seat of an echinococcus Embryo and this is actually the case, for in my cases I have found that the right lobe was diseased about five times as often as the left.

SYMPTOMS.

In the majority of cases the development of a hydatid cyst in the liver is slow, painless and imperceptible to the patient, but as its bulk increases a sense of distension or weight may be experienced especially in the right hypochondriac region and in rare cases distinct pain is present which is probably due to pressure on a nerve.

The pain is often felt in the right shoulder and this apparently when the parasite is situated in the convexity of the organ. A similar pain is associated with tropical abscess, but it is doubtful whether in either affection the presence of shoulder pain is suggestive of disease at the upper surface of the liver. When suppuration of the sac occurs there may be severe local pain probably due to local peritonitis. The passage of hydatid membrane through the bile ducts may cause a violent form of hepatic colic.

PHYSICAL SIGNS.

These vary with the precise situation and dimensions of the cyst.

A small parasite imbedded deeply in the substance of the organ may produce absolutely no signs and when ventrally situated and of moderated size it may increase the general bulk of the organ without altering its shape and thus it may escape recognition even after careful examination but in the case of large hydatids no such difficulty can arise, for in the great majority of them the shape of the organ is so altered that an outgrowth may readily be discovered, the form and size of which may vary greatly in different instances.

The tumours may grow in any direction and it may range in prominence from a mere elevation, above the general surface of the organ up to a distinctly pre-dunculated cyst, the chief bulk of which may be separated from the liver by a distance of several inches. When small multiple cysts are present the surface of the enlarged organ may be uneven and then it may simulate cancer. In rare instances outgrowths from a large cyst may produce a similar surface. Displacement and compression of adjacent structures are often caused by hydatid cysts, for example part of the liver itself may be displaced by the growth. A cyst on the convexity of

the liver may not only displace the diaphragm upwards but at the same time depress the bulk of the organ downwards so that the displaced part of the liver may be mistaken for the hydatid cyst itself; similarly a large hydatid connected with the right lobe but not imbedded in it may displace the greater part of the liver to the left. By such compression considerable injury may be done to the viscus and atrophy may be induced as in the case related by Boecker (Zur Statistik der Echinococcus No. 9). When the parasite is situated on the convexity of the liver it generally grows upwards and pushing before it the diaphragm invades the thoracic cavity and causes compression of the lung. The heart may be displaced to the left side by the lateral growth of a cyst on the upper surface of the liver and not only may it suffer a lateral displacement but it may also be bodily pushed forward against the chest wall by the lateral growth of a hydatid of the right lobe. More frequently than upwards or laterally the direction of the growth is downwards into the abdominal cavity. The size to which a hydatid of the liver may attain in a downward direction is enormous and is limited only by the capability of distension of the chest, abdomen and pelvis. Pressure on the portal vein is rare and asites is seldom an accompaniment of Hydatid.

In consequence of the yielding character of the gas

containing stomach and intestine it is rare for these organs to be much disturbed by the slow growth of the hydatid of the liver. Pressure on the gall bladder and bile duct is also uncommon, consequently jaundice is not an usual symptom of it, but the gall bladder may itself be the seat of an echinococcus cyst.

I have also had cases of hydatid cyst in the kidneys, the joints, the broad ligament, in the groins, the arm pits and post nasal region.

In hydatid of the lungs the X-Rays give a marked shadow which is very useful in diagnosis.

I might mention incidentally that I have not found the X-Rays of any benefit in stopping the growth of the cyst in the few cases in which I have used this method.

DIAGNOSIS.

The principal conditions with which hydatid may be confused are:-

A. Hydatid of the upper part of the liver.

1. Tropical Abscess.
2. Subphrenic "
3. Pleuritic Effusion.

B. Hydatid of the lower part of the liver.

1. Cancer of the liver.
2. Waxy liver.
3. Tropical Abscess.
4. Enlarged gall bladder.
5. Hydronephrosis.
6. Ovarian Cyst.
7. Ascites.

The other abdominal organs in which hydatid disease may occur are the spleen, kidney, omentum, mesentery, peritonium, pelvis, testicle, ovary, broad ligament and uterus. In most cases there is coexisting disease in the liver.

THE COURSE OF HEPATIC ECHINOCOCCI.

1. It may undergo "Spontaneous death and decay" and in this manner the disease in the host may end in "spontaneous cure."

2. The patient may die from the effects of pressure on important organs, from exhaustion or from the amount of destruction of liver tissue.

3. The sac may suppurate and become a focus of septicaemic infection and death may arise in this way.

4. The most frequent termination however is rupture of the sac followed by more or less complete evacuation of its contents.

The rupture may take place into

a. the pleural sac
b. bronchial tubes
c. the peritoneal cavity
d. stomach and intestines
e. urinary passages
f. through the abdominal walls.

OPERATIVE TREATMENT.

The classical methods of operating for hydatid disease are two in number.

1. Marsupialisation. By this is meant the fixation of the cyst walls into the abdominal walls and afterwards making a large opening into the cyst allowing the contents to escape. In some cases a partial resection of the cyst wall is done.

2. Complete Closure of the Cyst Cavity after removing its contents. In the first method the aim of the surgeon is to drain the cavity. In the second no drainage is done, the cyst is closed up by sutures and returned within the abdomen.

1. The method known as marsupialisation is the older of the two. It was first performed by Recamier in 1825. In 1877 Volkmann simplified the operation. The method adopted by the author is as follows:-

(a) In the case of the simple non-inflamed cyst. After sterilizing and opening the abdomen in the usual way, the patient being flat on his back, I place abundant packing round the cyst. I then, if the cyst is predunculated or in a suitable position, deliver as much as possible outside the abdomen. I then place two suspending sutures through the ectocyst. The ectocyst in the case of hydatid of the liver being formed of

peritoneum and a thin layer of liver substance. My next step is always to aspirate as much of the fluid as possible. I do this for two reasons:-

(1) because the uninflamed wall is very fragile and unless one is very careful the cyst is easily ruptured.

(2) it is a much cleaner and less risky way than cutting straight into the cyst.

After fixation of cyst which is now flaccid I open it in its longest diameter. It is then very simple if the cyst has not been inflamed to shell out the mother cyst. I then excise a portion of the ectocyst and bring the edges together in a way similar to stitching up a rent in the intestine, using gut that has been prepared with iodine. The operation is completed by closing the abdomen without drainage.

(b) <u>The inflamed cyst</u>. I treat in a similar way to abscess of abdomen. If possible I stitch the ectocyst to the abdominal wall, or if there are distinct adhesions I make my opening through those.

If there are no adhesions and it is in a position that it cannot be stitched to the abdominal wall I apply packing which has the end outside the abdomen in two places, and I drain through the centre of this packing, having in the first place removed all the inflamed cysts and pus that can be found and mopped up all fluid with dry sterile swabs.

2. The operation of suture without drainage was first performed by Thornton in 1883. Bond in 1891 slightly modified it (B.M.J. 1891).

Among the number of cases of hydatid disease on which I have operated I will select some of the more interesting for a more detailed description. My first very interesting case in a white man, came to me in 1896. He was a man of 30. When I saw him first he told me he coughed up blood on frequent occasions. He was extremely emaciated and his friend told me privately they thought he was gradually dying of consumption. On examination I found his temperature was over 100°. I found great distress over base of the right lung and there was shortness of breath, and its various accompaniments. In the right hypochondrium there was a distinct swelling which was very painful to the touch and fluctuated. They allowed me to explore this with a hypodermic needle and I drew off some pus like serum. At first I did not realise I was dealing with hydatid disease but simply concluded that there was pus which should be let out and informed the patient, so he consented to be operated on next day. As in those days it was nearly impossible to get qualified assistance I obtained the assistance of Mr. Schäfer, brother of Professor Schäfer, who knew how to administer chloroform. As the skin was red and there were undoubted signs of inflammation, I

opened the abscess boldly and to my astonishment an enormous quantity of hydatid cysts welled out, in fact the quantity nearly filled a washing basin. For about three weeks the cyst kept on discharging, especially when I dressed the wound, and I took the drainage tube out and after the cysts stopped, the bile stained discharge continued for some weeks. The subsequent progress of the patient was remarkable, his cough disappeared and he got quite fat and did all his former work. He consulted me for the same complaint about two years ago, which was sixteen years after the first operation. On this occasion he had no cough and had not lost weight. He complained of a fulness over the hypochondrium and also some lumps near the umbilicus. On examination I found that the liver was enlarged and slightly tender, especially near the old scar. There were numerous swellings all over the abdomen. One very large one which was slightly tender, was situated near the umbilicus. I explained the condition to the patient and told him that I would operate on him in a day or two. In the meanwhile, keeping him in hospital, I found he had a slight temperature in the evening sometimes rising to 99.2, his respirations ranged between 25 and 32 and he complained of great fulness especially on moving, he also had a number of pigmented moles coming out and disappearing at intervals. I have noticed this phenomenon in several cases of hydatid

disease. We opened the abdomen on the third day after admission and near the old scar I discovered a very tense tumour extending downwards and backwards, as the tumour was very tense we did not care to risk handling it too much and we decided to stitch it to the abdominal wall and open it. As on the previous occasion there were numerous hydatid cysts, but no pus, probably about half the quantity that there was before. After placing a temporary dressing we then cut down the middle line close to the umbilicus and below it and evacuated a large cyst with numerous daughter cysts. The daughter cysts were packed very closely together and in a short time, from the appearance of the mother cyst, I think we should have had distinct inflammation.

There were numerous cysts that we could feel on the mesentery and scattered all over the abdomen we did not touch. The top wound connected with the liver soon stopped discharging and healed in a little over a fortnight but the wound near and below the umbilicus was very tedious, and after discharging numerous cysts from the size of a hen's egg to that of a pea we had a serous discharge that continued for about two weeks. I saw this case about ten weeks ago and he is in robust health and quite comfortable. I consider the case extremely interesting chiefly because I have had him under observation for nearly nineteen years. In a case such as this where the

patient was practically riddled with hydatid cysts I do not think there is any object gained by attempting radical operation, in fact one could spend a week trying to dissect out numerous cysts from the great omentum and abdominal cavity and then the probability is a cyst that is left would take on fertility and grow. I hold that the hydatid is like the seed that the proverbial sower scattered, and it will not develop to any extent except on suitable ground or under some peculiarly favourable conditions which it is very hard to account for. One thing I am quite sure of. It is one out of numerous cysts that takes on active growth and hundreds of people have been affected who did not know they had the complaint.

I have seen attempts made to dissect out disseminated hydatid cysts from the mesentery and I have known one of the most expert surgeons in Australia loose one of these cases, which I think would not have felt much inconvenience. As a rule the wisest course in multiple hydatids of the abdomen is to await developments, I do not in any way mean to suggest that one or a few solitary hydatids should not be excised. In fact it is the usual practice which I have adopted and is done by the leading surgeons in Australia. In this case I had a blood count made by the Government Pathologist of Perth, there was a marked leucocytosis and increase in the Eosinophiles.

Before leaving the region of the liver I should like to describe another case which was under my care and presented several difficulties, and was not diagnosed for some weeks either by myself or various other surgeons. The first symptom that the patient complained of was slight pain in the right hypocondrium sometimes extending to the back and base of the lung. She was a strong healthy looking woman of 34. She had an attack of dry pleurisy two years before which was attended to by a doctor. It lasted about two weeks and she got perfectly well and felt no ill effect. Otherwise she had enjoyed exceptionally robust health, had a family of six, all very strong, and one would have picked her out as an unusually strong looking woman. I was called on account of slight pain in the same regions that she had before when she had pleurisy; I treated her for diaphragmatic pleurisy, but as the pain kept on recurring the highest temperature being 98.6., I had a consultation and no theory was suggested. A little while after this time a number of moles started to come out all over her, and although I had seen this in one previous case of hydatid it did not occur to me to associate hydatid disease, at the same time there was a distinct enlargement of the liver. Then I suggested another consultation to Dr. Newton, F.R.C.S. England, of Perth, who was called in and after carefully going into all the points of the case we

considered she was probably suffering from melanosis and that the enlargement of the liver was due to sarcomatous growth. However the patient did not seem to emaciate as one would expect and shortly afterwards I discovered distinct friction at the base of the lung followed by dulness and a rise of temperature to 100°. So after further consultation hydatid disease was suggested and an operation followed and about a pint of hydatid fluid was evacuated. It is remarkable that in this position such a large amount of cysts should have presented so few physical signs. After the evacuation of the cyst the patient made an uninterrupted recovery and lost all the moles except a few which may or may not have been there before.

In cases of hydatid disease of the abdomen one frequently sees attacks of urticaria and pigmentation, but I think the distinct pigmented moles that I have observed in this and other cases is rare and has not previously been recorded.

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