A case of pulmonary hydatid disease

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Introduction

HYDATID DISEASE characterised by hydatid cysts in various organs like the liver, lung, spleen, bone and other rare sites, is known to be endemic in many countries – America, Iraq, India, Australia and Europe. The condition was not reported in Malaya till Khaira in 1955 reported its occurrence in an Indian who had spent 4 years of his early childhood in India from where he could possibly have contracted the infection. However, the second case report by Duguid el al (1968) of hydatid disease in a 6-year-old Chinese boy, resident in Malaya throughout, established the possibility of local occurrence. In view of its rarity, the following case is deemed worthy of report.

Case Report

A 6-year-old male Indian child was admitted to the Lady Templer Hospital on 24.7.1969 for abnormalities discovered in chest X-rays. His complaints of "asthma-like" symptoms, treated unsuccessfully by various doctors developed a year after a three-month visit to India where he stayed on a cattle farm.

On clinical examination, the only positive finding was that of diminished breath sounds in the lower

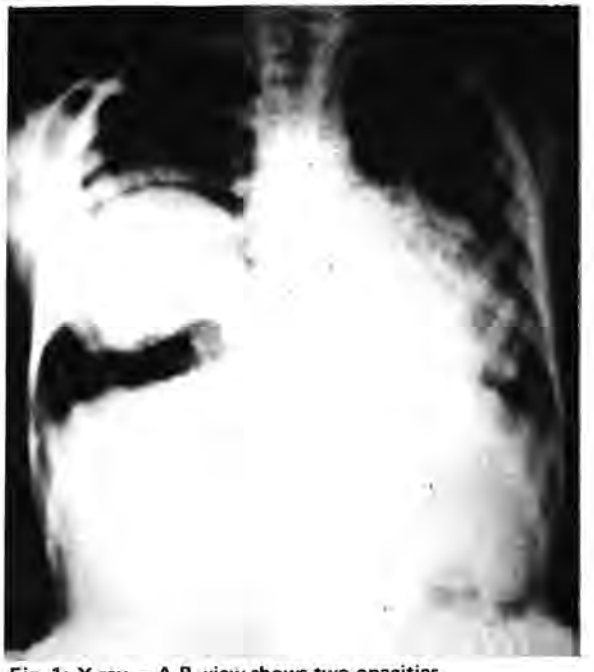

Fig. 1: X-ray – A.P. view shows two opacities.

chest, both laterally and posteriorly, on both sides. Chest X-rays showed large rounded opacities in both lungs. While in the A.P. view, there appeared to be two opacities in the right middle lobe and one in the left lower lobe; in the lateral views, the exact number of opacities in the right lung was found to be three.

A clinical diagnosis of metastases from a renal or adrenal tumour was made, but investigations along these lines, including I.V.P., proved negative. Consequently, a left postero-lateral thoracotomy was done on 5.8.69 and a cyst 3" in diameter was removed intact, followed by an uneventful recovery. A right thoracotomy was scheduled for four weeks later but in the meanwhile the patient developed right basal pneumonia. At the time of the right thoracotomy, three cysts, one in the middle lobe, one in the posterior basal segment and one in the lateral basal segment with evidence of the lower lobe pneumonia, were found.

The third cyst proved difficult to remove because of dense adhesions following the recent infection and when it ruptured, 10% formalin was instilled into it. The diagnosis of hydatid cyst was then obvious and part of the cyst was sent for histopathological examination which confirmed the diagnosis made at the second operation. Unfortunately, overwhelming bilateral pulmonary infection in the immediate post-operative period, unresponsive to treatment, occurred and the child died of respiratory failure on the fourth day.

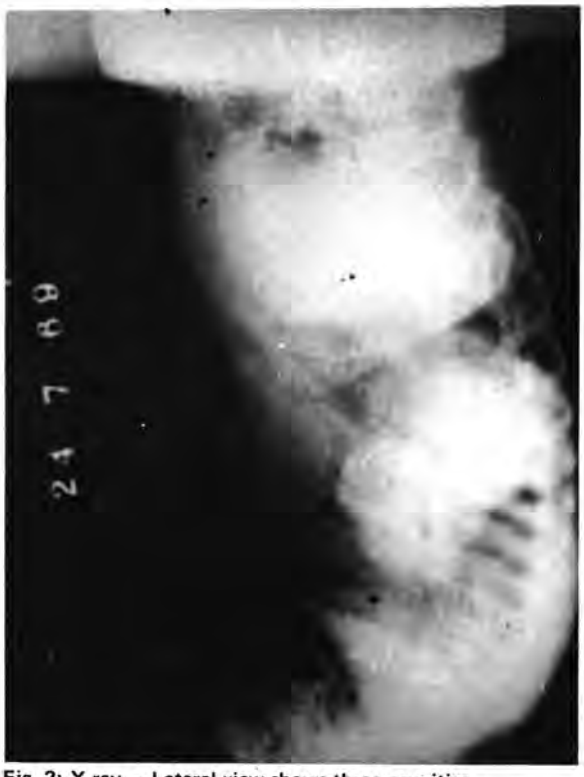

Fig. 2: X-ray — Lateral view shows three opacities.

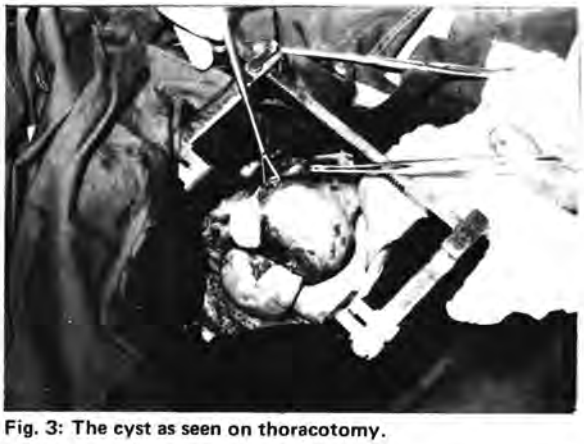

Fig. 3: The cyst as seen on thoracotomy.

Discussion

Of the four species of the genus ECHINOCOCCUS RUDOLPHI, the larval forms of E. GRANULOSUS is the commonest and the larvae, adapted to develop in comparatively long-lived intermediate hosts, grow relatively slowly. Under natural conditions at higher altitudes, the final host is the wolf and various wild ruminants serve as intermediate hosts. With the domestication of animals however, the dog has become a common definitive host and cattle, sheep, pigs, goats and man are the intermediate hosts.

A greater number of cysts in the sheep have been found to contain viable scolices than in those found in cattle, supporting the concept that sheep are the oldest intermediate hosts of E. GRANULOSUS, because of a more perfect host-parasite relationship (IMARI 1962), the hooked embryos usually being too large to pass the portal capillary filter. Lung involvement occurs in about 25% (IMARI 1962) and though generally pulmonary cysts are associated with cysts elsewhere, isolated lung cysts are frequently encountered. The lung tissue, because of its poor resistance, is a good medium for the growth of the echinoccocoal larvae, the cysts being commoner in the right lung because of its greater circulation.

The case under report is in accordance with this observation and with the general observation that the

Fig. 4: Solitary cyst from left side is seen.

Fig. 5: Close-up view of hydatid cysts from right side.

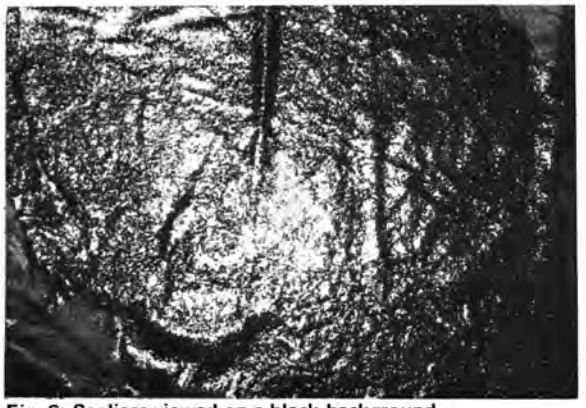

Fig. 6: Scolices viewed on a black background.

cysts are more common in the basal rather than in the upper lobes. The finding of isolated pulmonary cysts suggests inhalation as a route of entry (Reddy et al 1968;) though this has not been proved experimentally. Napier (1946) estimated that about 25% of people with hydatid disease are asymptomatic and symptoms, if present, are referrable to any number of respiratory complaints – cough productive or non-productive, haemoptysis, chest pain or asthma-like attacks as in the case presented.

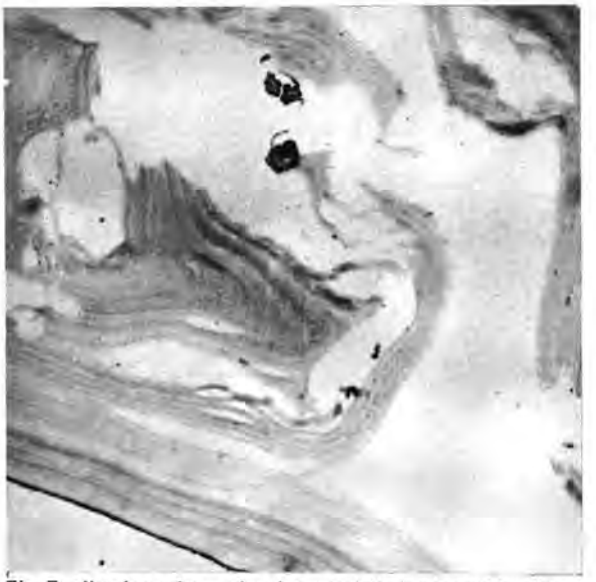

Fig. 7: Histology shows the characteristic laminated hyaline membrane with evidence of brood capsule.

Unusually large cysts, causing mechanical obstruction and collapse, rupture of cysts causing hydropneumothorax, or anaphylactic shock are some of the rare causes of an acute presentation in pulmonary hydatid disease. The typical rounded opacities on radiological examination are often diagnostic in countries where the disease is common, though sometimes they pose difficulties to the clinician. In unusual locations, as for example in the mediastinum, the cysts may simulate dermoid cysts or aortic aneurysms. Irregularly outlined posterior shadows may be difficult to differentiate from the neurofibromas.

In countries where the condition is rare, as in Malaya, in the differential diagnoses, primary or metastatic tumours, tuberculomas, gummas, non-specific abscesses and amoebic abscesses are generally entertained. It is relevant, at this point in the discussion, to stress the importance of lateral chest films to determine the exact number of cysts which is unreliable from A.P. views alone. Various laboratory aids to confirm the radiologic impression are available. A high eosinophilic count, up to 25% has been observed (Anderson 1966), resulting as an allergic response to small leakages of hydatid fluid. The reliability of this is obviously limited, particularly in

countries where other parasitic infections are common.

Casoni's skin test is the most wellknown diagnostic procedure and reliability, varying from 75% (Reddy et al 1968) to 95% (Kagan 1968), has been reported. Despite the high false positives observed by some (Chordi 1962; Sorice et al 1966), which according to Kagan (1966) can be considerably reduced by decreasing the concentration of the antigen used, the test is of value in diagnostic and epidemiologic studies.

In view of the fact that hydatid disease is now a recognised entity in this country, Casoni's antigen would be of tremendous advantage if made available to the clinician in the face of a diagnostic problem, as in the case under report, so that the patient need not be subjected to unnecessary and cumbersome procedures, like I.V.P., etc.

Among the various serological tests, which include complement fixation, Bentonite-flocculation and haemagglutination, haemagglutination is considered to be the most sensitive, though in pulmonary hydatid cysts a lower sensitivity has been observed (Garabedian et al 1959; Jonathan 1960; Arabatzis and Papaganagiotou 1963). They have immense postoperative assessment value, but the complement fixation test reverts to negative more quickly than the others following removal of cysts and a persistent complement fixation titre 6 – 12 months after cystectomy may indicate presence of a second cyst (Kagan 1968). Fluorescent-antibody test, using protoscolices of fertile cysts as antigen, has shown to produce excellent results (Pozzuoli et al 1965; Sorice et al 1966) but needs further evaluation.

The final diagnosis, however, rests on the histopatholic examination of the cyst. When the parasitic larvae reach a susceptible organ, they develop into cysts of varying sizes. The tissue response consists of hyperemia, proliferation of connective tissue, epithelioid cells, eosinophils and foreign body giant cells, which results in the formation of the adventitious layer of the cyst. The parasite's contribution to the formation of the cyst wall consists of an outer laminated layer and an inner germinal layer from which brook capsules containing scolices develop over a period of months.

The cysts may undergo a variety of changes, including suppuration, collapse, fibrosis and calcification. Though the presence of typical scolices in the cyst fluid or cyst wall clinches the diagnosis, the esoninophilic laminated cyst wall is characteristic enough to make a definite histologic diagnosis, when one is dealing with acephalo cysts.

Conclusion

A case of pulmonary hydatid disease in a 6-year-old male Indian child who succumbed to a fulminating lung infection following surgical removal of the cysts is described, with a brief discussion on the common clinical and pathologic findings. Though there is a history to suggest that he may have contracted the infection while in India, from the large size of the cysts and the general observation of the short interval between exposure to infection and development of the cysts, we feel that it is highly possible that he may have acquired the infection locally.

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