In many cases brain biopsy is not performed if the other features are present. The association of high-voltage synchronous complexes recurring at regular intervals over a long period of time, and separated by periods of relative electrical silence associated with involuntary movements, enables a diagnosis to be made with confidence (Cobb and Hill, 1950; Radermecker and Poser, 1960), but similar phenomena have been reported in encephalitis due to other causes (Lesse *et al.*, 1958; Hoefer *et al.*, 1959) and in head injury (Zappoli, 1959).

In the present case it seems probable that the encephalitis was of the subacute inclusion-body type but that he eventually recovered. The alternative explanation is that the patient suffered from another variety of subacute polioclastic encephalitis, but exhibited an E.E.G. record identical to that seen in inclusion-body encephalitis. The former explanation is favoured in this patient, particularly as recovery has been observed occasionally in similar cases (Kurtzke, 1956; Simpson, 1961).

The completeness of the recovery and the reversal of the abnormal E.E.G. pattern make it unlikely that relapse will occur, because the remissions observed in the early phases of the disease are usually incomplete, the patient remaining with a significant psychiatric and neurological disability.

A further point of interest in this patient is the transient occurrence of polyuria. Unfortunately his lack of co-operation made it impossible to carry out tests to prove the presence of diabetes insipidus, but the low specific gravity of the urine after fluid deprivation and the reversibility with vasopressin suggested this diagnosis rather than that of compulsive water-drinking. It is therefore probable that there was involvement of the neurohypophysis or of the pituitary stalk by the encephalitic process in this case. This corresponds with the pathological observations of van Bogaert (1945), who found extensive subcortical involvement of white and to a less extent of grey matter.

## Summary

A patient is described who was probably suffering from subacute inclusion-body encephalitis but who made an apparently complete recovery. This occurrence, and the unusual development of polyuria in this patient, are discussed in the light of previous knowledge of the disease.

We are indebted to Dr. J. N. Walton for his encouragement and kind permission to publish the details of this case.

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# Solitary Pyogenic Liver Abscess

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*Brit. med. J.*, 1964, **2**, 613–615

An extensive literature exists concerning solitary pyogenic abscess of the liver. It is not the purpose of this paper to reiterate the main features of this condition but merely to comment on its aetiology. The single pyogenic liver abscess differs from multiple liver abscesses in that its cause often remains obscure (Ochsner *et al.*, 1938). In one large series of 24 cases the cause was determined with certainty in only two (Rothenberg and Linder, 1934). An obscure aetiology has come to be accepted as a feature of single pyogenic liver abscess, and it is perhaps unfortunate that the word "cryptogenic" has come to be associated with the condition.

It is our experience that, though such abscesses may initially be cryptogenic, the cause not infrequently becomes apparent if the patients are investigated and followed up after surgical cure of the abscess.

During 1958–63 six patients with solitary pyogenic liver abscesses were seen in the thoracic surgical department of the Bradford Royal Infirmary. All were initially cryptogenic. The following case records relate to four of these patients in whom the probable cause of the abscess was eventually discovered. One patient in whom the cause remains unknown is still under observation. Another patient, a vagrant, has been lost sight of. None of the patients had been exposed to the risk of amoebic infection.

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## Case 1

A woman aged 62 was admitted to hospital on 21 October 1958 mentally confused, dyspnoeic, and cyanosed. One month previously she had developed a dry cough, malaise, and anorexia, followed later by rigors and increasing dyspnoea. She was treated at home with sulphonamides, penicillin, and tetracycline. On admission there was dullness on percussion at the right base, with coarse crepitations at both bases. W.B.C. count was 20,000/c.m.; haemoglobin 65%; serum bilirubin 0.8 mg./100 ml.; serum alkaline phosphatase 21.8 K.A. units; total serum protein 5.1 g./100 ml. X-ray examination showed elevation and immobility of the right dome of the diaphragm, congestive changes at the bases of both lungs, and a small pleural effusion on the right side. An erroneous diagnosis of subphrenic abscess was made.

The subphrenic space was approached through the bed of the eleventh rib. No subphrenic abscess was found. The surface of the liver looked normal, but on palpation an area of abnormal consistency was felt in the upper and posterior part of the right lobe of the liver. An exploring needle encountered pus 1½ in. (3.8 cm.) from the liver surface. An abscess containing 10 oz. (285 ml.) of foul-smelling pus was opened and drained. The pus proved to be sterile on aerobic and anaerobic culture. The patient's subsequent improvement was rapid.

After recovery a barium-meal examination showed a large penetrating ulcer on the middle of the lesser curvature of the stomach. She admitted to no symptoms of peptic ulcer either at the time of *x*-ray examination or in the past. Follow-up over a year showed

steady decrease in the size of the ulcer with the development of some hour-glass contraction.

It is assumed that the gastric ulcer was the portal of entry of the liver infection.

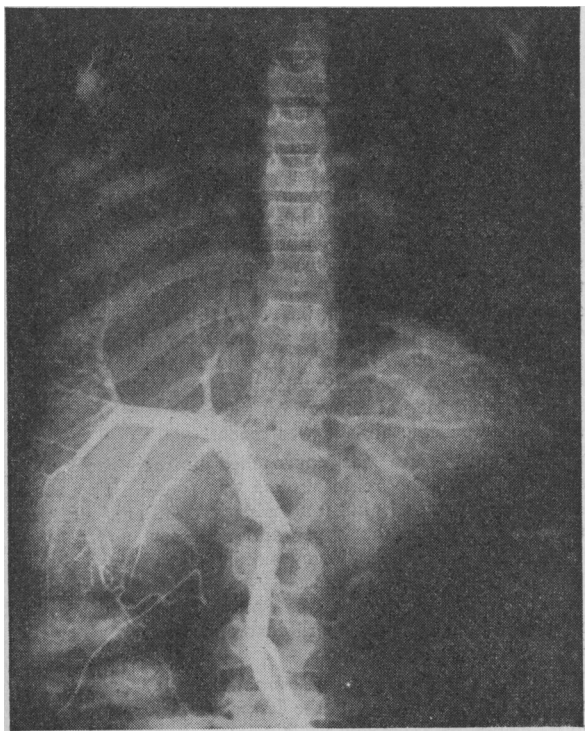
## Case 2

This patient, a man aged 54, suffered from generalized neurofibromatosis. On 28 September 1959 he was admitted to another hospital complaining of aching epigastric pain. Barium-meal examination and cholecystography were reported as normal. Although no comment was made at the time, these *x*-ray films showed elevation of the right dome of the diaphragm with a localized bulge anteriorly. Six months later he developed rigors and became short of breath. On admission he was dyspnoeic and mentally confused. The liver was enlarged and tender. W.B.C. count was 41,000/c.m.; haemoglobin 104%; serum bilirubin 0.8 mg./100 ml.; serum alkaline phosphatase 18 K.A. units; blood urea 129 mg./100 ml. Repeated blood cultures were sterile on aerobic and anaerobic culture. *X*-ray examination showed elevation and immobility of the right dome of the diaphragm. A diagnosis of liver abscess was made. An abscess containing 15 oz. (425 ml.) of pus was found in the right lobe of the liver. The pus was sterile on aerobic and anaerobic culture. The patient remained toxic and drowsy for a week. He developed bilateral lung abscesses and a sterile effusion in the left pleural cavity. He eventually made an apparently complete recovery. Post-operative barium meal, barium enema, and cholecystogram were negative.

*Follow-up.*—A year later he was readmitted to hospital as an emergency in a moribund state. Death was found at necropsy to be due to perforation of the jejunum at the site of an ulcerated neurilemmoma of the jejunum. The tumour, occurring in association with generalized neurofibromatosis, was benign. It is assumed that the portal of entry of the hepatic infection was the ulcerating neurilemmoma of the jejunum.

## Case 3

The patient, a girl of 13, developed a pain in the lower part of the right side of her chest in November 1962. In January 1963 she began to run a swinging temperature and had several rigors. The liver was palpable one fingerbreadth below the costal margin. *X*-ray examination showed marked elevation of the right dome of the diaphragm. A diagnostic pneumoperitoneum showed the air to separate the liver from the diaphragm over most of the liver surface. The W.B.C. count was 11,000/c.mm. with no eosinophilia. After a 10-day course of tetracycline the temperature settled. A tentative diagnosis of liver abscess was made.



Portal venogram in Case 3 showing deficient portal venous system in the upper part of the right lobe of the liver.

Laparotomy was carried out through an upper right paramedian incision. The liver was slightly enlarged. Its edge was rounded, giving it a somewhat swollen appearance. A hand could be passed upwards as far as the coronary ligament and laterally round the right lobe without encountering any adhesions. Near the coronary ligament the liver felt firm and irregular, and there was a local rise of temperature. A portal venogram was done via a jejunal vein in the hope of demonstrating a lesion within the liver. The venogram showed a deficiency in the portal venous system in the upper part of the right lobe of the liver (see Fig.). On the following day the patient began to cough up thick pus. The sputum contained a pure growth of coagulase-positive *Staphylococcus aureus*. Her condition improved dramatically and she was discharged under observation with a diagnosis of liver abscess which had ruptured into a bronchus.

*Follow-up.*—During the next six months the right dome of the diaphragm descended to normal level, apart from one area where there was a rounded upward bulge. Seven months after laparotomy the child again had chills and rigors, and a right thoracotomy was done. The central part of the right lower lobe of the lung contained a rounded swelling. The lobe was adherent to the diaphragm. As the adhesions were being divided the envelope of a hydatid cyst was encountered. The cyst was full of pus. It was hour-glass in shape, lying partly in the liver and partly in the lung, with its waist at the hole in the diaphragm. The lower lobe was removed and the cavity in the liver drained. Histological examination confirmed that the lesion was an infected hydatid cyst. The patient made a rapid recovery and has remained well.

## Case 4

A man of 45 was admitted to a medical ward on 29 November 1962 with a history of chills and a rigor 14 weeks previously. Rigors, sweating, and pyrexia persisted for a week. He was well for two weeks, then symptoms recurred. At this stage he complained of right shoulder-tip pain. *X*-ray examination showed elevation of the right dome of the diaphragm. A needle inserted into the region of the right lobe of the liver encountered thick pus from which non-haemolytic streptococci were grown. Tetracycline and sulphadimidine were given and he was discharged on 4 January 1963.

He was readmitted a month later and transferred to the thoracic surgical department. By this time there was an abscess pointing through the skin in the mid-axillary line over the liver. Rib resection was done and the subphrenic space opened. There was a subphrenic abscess. The liver above and behind the subphrenic abscess felt firm and irregular. It was incised and a large abscess cavity found in the upper part of the right lobe. The pus from the abscess contained non-haemolytic streptococci. After drainage of the abscess the patient made a rapid recovery.

*Follow-up.*—A barium-meal examination and cholecystogram revealed nothing abnormal. A barium enema was reported as showing colitis affecting the sigmoid colon. At sigmoidoscopy the mucosa of the sigmoid colon was found to be inflamed. There was a good deal of contact bleeding. Two small ulcers were seen. No amoebae were found in swabs taken from these ulcers. In view of these findings the patient was again questioned. It was discovered that during the previous four years he had had some looseness of the bowels. He was accustomed to having two loose motions before breakfast. He said that he had become so used to this that he had not thought to mention it.

It is assumed that the portal of entry of the liver infection was probably the colon, which is involved in a low-grade ulcerative colitis.

## Discussion

Although the onset may be insidious, the patient with a solitary pyogenic liver abscess eventually becomes gravely ill. The immediate crisis overshadows all else and there is no place for a detailed search for the causal lesion. In contradistinction to multiple liver abscesses, the mortality of the single liver abscesss is low and the opportunity to discover the cause at

necropsy does not often arise (McFadzean *et al.*, 1953). Although initially such abscesses may be cryptogenic, the cases described above suggest that the term cryptogenic should not be lightly applied to the condition, as the cause may become apparent if investigations are pursued after the patient's recovery from the acute phase of the illness. In many of the published series emphasis is placed on details of the surgical treatment of the abscess and the case records cease with its clinical cure, leaving its aetiology undetermined. In our experience the most profitable field of subsequent investigation lies in the area of portal venous drainage. The type of lesion to be looked for is some quiet focus of infection which may be giving rise to no symptoms. Thus the frequency with which the cause of the abscess is found will depend on the thoroughness of the search. The large asymptomatic gastric ulcer in Case 1 was easily found, but the neurilemmoma of the jejunum in Case 2 escaped detection on routine barium follow-through examination.

In our four patients the probable cause of the abscess was found after periods of follow-up and investigation ranging from one month to a year.


## Summary

Out of a total of six cases with solitary pyogenic liver abscess seen over a period of five years, four are described in which the probable cause of the abscess was found later.

The occurrence of such an abscess where the cause is unknown is an indication for follow-up and detailed investigation after treatment of the abscess.



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# *Medical Memoranda*

## Treatment of Weber–Christian Disease

*Brit. med. J.*, 1964, **2**, 615–616

Weber-Christian disease is characterized by periodic attacks of crops of painful and tender subcutaneous fatty nodules associated with fever. The length of the attacks is irregular, as are the periods of remission.

The cause of the disease is unknown. It has been suggested that it may be due to a generalized disorder of fat metabolism; ischaemia secondary to thrombosis or endarteritis of small vessels, with subsequent fat-cell necrosis and cellular infiltration. In susceptible persons trauma, cold, or administration of iodides can produce the manifestations.

The initial pathological changes are accumulations of lipophages in the panniculus, often associated with periarteritis and arteriolitis. Areas of fat-necrosis and oedema appear with increased cellular infiltration. Late lesions show less necrosis and inflammation with fibrous-tissue replacement. Though largely affecting the subcutaneous fat, any area of fat-deposit may be affected. The disease affects females more than males, but any age may be affected. The thighs are most often involved; legs, arms, and trunk sometimes; and buttocks, breasts, hands, and face rarely.

Many agents have been recommended for the treatment of Weber-Christian disease. Beerman (1953) quotes references to the use of:

| | | |
|---|---|---|
| Sulphonamides | Chloroquine | Multiple transfusions |
| Penicillin | Quinine | Salicylates |
| Streptomycin | Gentian violet | |
| Aureomycin (chlortetracycline) | Ferrous citrate | |
| Antihistamines | Antimony | |
| Vitamin E | Gold | |
| Insulin | Arsenic | |
| A.C.T.H. | Mercury | |
| Cortisone | X-ray therapy | |
| | Thyroid extract | |
| | Pituitary extract | |

He found that sulphapyridine and penicillin appeared successful in some cases. Various sulphonamides were reported by Miller and Kritzler (1943) to be of little value. Sulphapyridine was reported by Arnold (1945) to control symptoms of a patient who relapsed on each of five occasions when the drug was discontinued. Koch (1951) also found sulphapyridine of value, and he reported a case in which nodules disappeared after 20,000 units of penicillin three-hourly for 15 days.

O'Connor (1960) described the case of a patient first seen in 1938. At that time her nodules regressed in 18 days with salicylate therapy, following which there were intermittent attacks, the remissions varying from three to nine months. Myers (1959) described two cases. The first failed to respond to sulphonamides, penicillin, salicylates, and streptomycin, but responded dramatically after 10 days' chloroquine therapy, as did a further attack after a long remission. The second case had penicillin and corticosteroids with little effect. Chloroquine diphosphate 0.25 g. b.d. produced improvement in 10 days, the improvement continuing with treatment for a further two months.

The natural remissions of the disease make assessment and treatment very difficult, especially in view of the rarity of the complaint. Kennedy and Murphy (1949) report 38 cases in the literature from 1892 to 1949. Beerman (1953) found 82 cases in the literature and concluded that the actual number of reported and unreported cases must be fewer than 100. It can thus be seen that though many treatments have been recommended few are satisfactory. The following case history is therefore of interest.

### Case Report

The patient, a woman aged 46, gave a seven-year history of recurrent painful swelling in the arms and legs associated with tiredness and weakness. E.S.R., chest *x*-ray picture and full blood count were normal, and biopsy of a subcutaneous nodule showed nodular non-suppurative panniculitis. In July 1961 she was treated with prednisolone 10 mg. t.d.s. and after a month, during which she improved, it was reduced to 5 mg. t.d.s. A month later she developed a chest infection and skin sepsis and the prednisolone had to be withdrawn. In February 1962 she had a recurrence of the nodules and was given prednisolone 10 mg. b.d. reducing to 5 mg. b.d. two weeks later. She continued to develop nodules until May, when it was decided that steroids were not helping and treatment was stopped. In December she had a further recurrence and it was decided to try the effect of Tanderil (oxyphenbutazone). She was given 200 mg. t.d.s. The nodules disappeared within seven days and treatment was stopped, but within four days further nodules appeared. Tanderil was again started in the same dosage, and after three days, when the nodules began to regress and she was feeling better, the dosage was reduced to 100 mg. t.d.s. After a further four days the nodules had completely disappeared and she was continued on the same dosage for another four weeks. A month later further nodules appeared. These rapidly regressed on starting Tanderil 200 mg. t.d.s., reducing after three days to 100 mg. t.d.s., and treatment was stopped after one month. Two further exacerbations occurred within the next three months and on each