without a detectable loss occurring in the antigenic activity of all of its three components. It is suggested that refrigeration at 0° C. to 10° C. would be equally suitable. At higher temperatures, such as 21° C. and 31° C., the activity is much less stable, especially in the case of the type 1 component.

It is important, therefore, that transportation of unrefrigerated vaccine in temperate climates should be carried out in as short a time as possible. Since considerable reduction in the activity of the type 1 component was found to occur after 40 days' storage at 21° C., it is suggested that vaccine should not be held unrefrigerated for periods longer than seven days.

It is also suggested, in view of the rapid loss in activity which was shown to occur at 31° C., that transportation of vaccine in tropical climates should not be carried out without refrigeration facilities.

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Medical Memorandum

An Unusual Cause of Solitary Hepatic Abscess

Hepatic suppuration is an uncommon condition, and solitary hepatic abscess comprises a small proportion of this group. The following case of solitary hepatic abscess was of such unusual aetiology that it is recorded.

CASE REPORT

A man aged 34 was admitted from the casualty department on June 27, 1957, with a history of recurring attacks of epigastric pain in the previous six weeks. An attack had occurred on most days, lasting a variable number of hours; the pain was severe, sustained in its intensity, and radiated into the upper lumbar region. It had no relation to meals, activity, or personal habits, and it was not relieved by antacids or food. There had been no nausea or vomiting. His bowel habit was regular, and he had had no disturbance of micturition. A particularly severe attack of pain lasting six hours caused his admission to hospital.

On admission the patient was not in obvious pain; mouth temperature was 100.4° F. (38° C.). No abnormality was seen on inspection of the abdomen. Palpation revealed tenderness with guarding of the epigastrium and beneath the right costal margin. There were no physical signs elsewhere in the abdomen. The rest of the physical examination revealed no abnormalities; urinalysis was negative; Hb, 12.4 g./100 ml.; W.B.C. 15,000/c.mm. (neutrophils 70% and monocytes 10%).

A provisional diagnosis of "leaking" peptic ulcer was considered and a radiograph of the abdomen carried out to detect free air under the diaphragm. A gas shadow was not seen, but the antero-posterior film did reveal a sewing-needle lying to the right of the first and second lumbar vertebrae. The air-filled duodenal cap was seen below the needle, suggesting that the needle was outside the gastro-intestinal tract (see Fig.). On further questioning, the patient admitted that he had for several years swallowed objects, mainly needles, as a trick in public-houses; he stoutly denied that any harm had resulted from this pastime.

On the assumption that he had a perigastric abscess a laparotomy was performed (Mr. K. F. Wood). In fact, a

large tense fluctuant swelling (15 cm. in diameter) was found within the lobes of the liver. There were a few flimsy adhesions between the first part of the duodenum and the underside of the liver but without evidence of a perforation of the stomach or gut. Pus was obtained on aspiration of the swelling. The abscess was then excluded from the peritoneal cavity by packs and drained externally by a rubber tube. A needle 4.5 cm. long was found embedded in the wall of the abscess. Post-operatively the liver-function tests were normal and culture of the pus showed it to be sterile. The patient made an uneventful recovery and left the hospital on July 27.

Biopsy of abscess wall (Dr. O. G. Dodge) was reported to have the appearances of a non-specific subacute liver abscess.

Needle lying above gas shadow of duodenum.

COMMENT

Pyogenic abscesses of the liver are relatively uncommon. Ochsner, DeBaKey, and Murray (1938) found 42 cases in half a million admissions during a 10-year period at the Charity Hospital in New Orleans. In these and other statistics (Rothenberg and Linder, 1934; Eliason *et al.*, 1938; Kisner, 1947; Yarvis, 1953) both multiple and solitary abscesses are grouped together, although it is clear that multiple lesions arising usually from appendiceal or gall-bladder infections greatly outnumber solitary ones.

Penetrating injuries from without occasionally result in a solitary hepatic abscess; there is, however, only one previous record (Morris, 1940) of the transperitoneal migration of a foreign body—in this case a toothpick—from the gastro-intestinal tract to the liver. As in the above case, there was no naked-eye evidence of perforation on the gut surface, although there was marked adherence of the colon, omentum, jejunum, and pancreas to the abscess site.

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