and the generalized nature of the disease process. Where disease is localized to one particular region as the orbit, radiotherapy may be preferable.

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*Listeria monocytogenes* meningitis in adults: a report of two cases

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The Gram-positive bacillus *Listeria monocytogenes* is widespread in the animal kingdom but not a common pathogen in man (Gray, 1962). Since its first isolation by Murray, Webb & Swann in 1926 its appearances in this role are increasing. It most frequently causes a meningitis in the very young (Edmunds, Nicholson & Douglas, 1957) but may present as a septicaemic condition in the foetus or newborn (Granulomatosis infantiseptica, Harding & Brunton, 1962; Beck, O'Brien & Mackenzie, 1966), as an infectious mononucleosis-like syndrome (Girard & Murray, 1951) or on the genitalia, when it may cause habitual abortion (Toaff, Krochik & Rabinovitz, 1962; MacNaughton, 1962). Pustular conditions of the skin and conjunctivitis are also described, particularly in veterinary workers. (Owen et al., 1960).

When it causes meningitis in the adult, it typically singles out debilitated patients and those on steroids (Ford, Herzberg & Ford, 1968). Healthy individuals are also susceptible and twenty-one cases are recorded in the English literature (Finegold et al., 1954; Binder et al., 1957; Dedrick, 1957; Welshimer & Winglewish, 1959; Whitty & Macaulay, 1965; Librach & Seth, 1961).

The diagnosis is seldom immediately apparent. It may be delayed because the organism is dismissed in bacteriological preparations, or it may not grow at all under ordinary conditions (Gray, 1962). A source of infection is rarely identified (Beck, 1961).

The following two patients, both presenting in the same area within a year are reported to emphasize the occurrence of *Listeria monocytogenes* meningitis in healthy adults.

Case reports

Case 1

A 46-year-old lorry driver was admitted on 28 July 1968, with a 24-hr history of back and neck pain of acute onset. He complained of severe headache. There was no relevant past history.

On examination his temperature was 105°F (40-6°C) pulse 80/min. He was confused and agitated. Neck stiffness was present. There were no enlarged lymph glands or photophobia, and tendon jerks and plantar responses were normal. Kernig's test was negative.

Lumbar puncture: The CSF pressure was normal, and the glucose and protein levels were 45 mg/100 ml and 230/100 ml. The white cell count was 340/mm³ (70% lymphocytes). No organisms were seen on a Gram-stained preparation.
Case reports

Next day his condition was unchanged. Lumbar puncture now produced a turbid fluid with less than 10 mg/100 ml of glucose and 700 white cells/mm³ (62% polymorphs). Again no organisms were seen on stained film of the deposit. Chest X-rays were normal and peripheral blood count showed Hb 92%, WBC 15,000/mm³ (84% polymorphs). The CSF findings were taken to indicate an unidentified bacterial meningitis and so penicillin intramuscularly and oral sulphonamides were administered.

Progress. He gradually improved, and 6 days after admission a Gram-positive bacillus was isolated from the initial CSF cultures. This organism was sensitive to the usual range of antibiotics. On the 12th day the antibiotics were withdrawn, and by the 20th day he was well and apyrexial. Lumbar puncture: CSF pressure 250 mm with WBC 44/mm³ (mainly lymphocytes) and protein 115 mg/100 ml.

One month after admission the patient was discharged completely recovered.

The organism isolated was identified as Listeria by the usual biochemical and animal pathogenicity tests, while virus studies (blood, CSF and stool) and toxoplasma test were negative.

Case 2

A 69-year-old retired docker was admitted to hospital with a history of increasing disorientation over 24 hr. He complained of pains in the head, chest and abdomen. The only past history was of mild chronic bronchitis, and some angina pectoris over 6 months. On examination he was confused with slurred speech. His temperature was 103°F (39-4°C) with scattered rales and rhonchi in the chest. There were no signs of meningitis and no other central nervous system abnormalities.

Blood count: WBC 15,600/mm³ (96% polymorphs). Blood was taken for culture and a lumbar puncture performed because of his confusion. The CSF pressure was normal, glucose 94 mg/100 ml, protein 260 mg/100 ml. WBC 1500/mm³ (95% polymorphs) and red cells 5000/mm³. No organisms were detected in the spin deposit. The pyrexia and cell counts in blood and CSF were taken to indicate an unidentified bacterial infection, probably involving the meninges. Therefore, intramuscular penicillin and streptomycin were administered.

Progress. The patient's condition appeared to worsen over the next 36 hr. Cheyne-Stokes respiration occurred and neck stiffness became pronounced. Pupil reactions, tendon jerks and plantar responses remained normal. Lumbar puncture now showed a CSF glucose level of 75 mg/100 ml, protein 80 mg/100 ml and WBC 600/mm³ (50% polymorphs).

On the 3rd day a Gram-positive bacillus was isolated from the blood culture, and found to be fully sensitive to the appropriate antibiotics. This later proved to be Listeria monocytogenes. Improvement was rapid in the next 2 days, and 10 days after admission the patient was apyrexial and fully ambulant and treatment was discontinued.

Discussion

Listeria is increasingly recognized as a cause of meningitis in adult as well as paediatric patients. Isolation in the laboratory, however, may be difficult. The organism may be mistaken for a contaminating diphtheroid, or, if over decolourized, for a Gram-negative bacillus. If suspected it can be separated from other organisms by its ability to grow at room temperature and survive refrigeration. It may be isolated from the specimen only after several months at 4°C (Ray & Wedgwood, 1964). Initial isolation may be the greatest obstacle for reasons still obscure, but varies from strain to strain. Those described here were isolated without difficulty on standard media. CSF is usually a more fertile hunting ground than blood.

Treatment is not usually a problem, and organisms isolated in most reported cases have been fully sensitive to the common antibiotics tested. Occasionally resistance has been noted to penicillin (Harding & Brunton, 1962; Barber & Okubadejo, 1965) but not to ampicillin.

The increased incidence of Listeria infections is more likely to be apparent than actual. The evidence points to an increased awareness of the organism's existence and growth requirements as the main factor in its growing diagnostic popularity.

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References


Pneumoperitoneum associated with *Escherichia coli* peritonitis: a report of two cases

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The finding of a pneumoperitoneum on X-ray of the acute abdomen prior to operation usually signifies the presence of a perforation of the gastrointestinal tract. Very occasionally however no perforation is present, and this may lead to difficulty in diagnosis. The following two cases are published as an illustration of this latter instance.

Case reports

Case 1

Mrs. M.G., a 48-year-old housewife required emergency admission to hospital with a 3-day history of colicky lower abdominal pain accompanied by abdominal distention and vomiting. For 4 days prior to the onset of her pain, she had suffered from nausea and anorexia and had been feeling generally weak and unwell.

Her past medical history was negative.

On examination, her temperature was 100-8°F, pulse rate 108, and blood pressure 105/70 mmHg. Her abdomen was distended, and there was tenderness in the lower part of the abdomen. The bowel sounds were slightly increased. Rectal examination was negative.

An X-ray of the abdomen in the erect position showed numerous fluid-levels in the distended small bowel; gas was also present under both domes of the diaphragm, particularly on the left (Fig. 1). The haemoglobin was 12.6 g/100 ml, WBC 11,400 cells/mm³. A blood-film showed evidence of neutrophilia.

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FIG. 1. X-ray of abdomen in erect position showing fluid levels in distended small bowel and gas under the diaphragm.
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