

LATENT BRUCELLOSIS

Like many infections brucellosis is seen in an acute form, a chronic form, and as a latent or "inapparent" infection. Description of the acute form as a specific fever came first, and owing to the striking character of the pyrexia this is still widely known as undulant fever. The chronic form is often a long-continued illness of insidious onset and with a tendency to recurrent exacerbations, whose chief symptoms are excessive and usually nocturnal sweating, lassitude, and joint pains; pyrexia is low, irregular, or absent. In chronic brucellosis the diagnosis is often missed; blood cultures are rarely positive; serum agglutination of *Brucella abortus* is not necessarily associated with clinical symptoms, nor is a brucellin skin test. The condition is more common in those over than under 40, and in agricultural districts than in towns; a history of drinking raw milk or of prolonged contact with farm animals may be a valuable clue. Unpasteurized milk is well known to be a cause of both *Br. abortus* and *M. tuberculosis* infection, even when the milk is derived from tuberculin-tested attested herds. The possible danger of contracting tuberculosis from such a source was recently pointed out in a report published in this journal.¹ The chronic form of brucellosis is particularly associated with strains of *Br. abortus*, which, with rare exceptions, is the only type of the organism found in Britain.

Evidence that latent brucellosis may be more common than is usually supposed has been strengthened by epidemiological studies, including agglutination and skin testing, on farmers, farm workers, and veterinarians^{2, 3}; and in this issue Drs. Ian McWhinney and A. P. Prior (p. 80) describe a study of this kind on 20 farm-worker volunteers from one general practice in Warwickshire, none of whom had a history of undulant fever. The brucellin test was found to be very strongly positive in five, strongly positive in five, positive in one, and negative in nine. Antibodies to a *Br. abortus* antigen were present initially in a titre of 1:40 or more in eight (five of whom had also a strongly positive skin test), and a second agglutination test two to three weeks later was positive in ten, of whom eight showed a rise in titre. Careful inquiry into past histories then elicited the information that two of the volunteers had had undiagnosed illnesses, one ten years previously and the other 25 and 11 years previously, which by their description were almost certainly acute or chronic brucellosis. On the evidence of the two

tests combined and the common history of work on farms, it would appear that 14 out of 20 (70%) of farm workers in a district of mixed arable and stock farming had been infected with *Br. abortus*, 12 having had no recognized symptoms and two having had previous undiagnosed illnesses which were probably brucellosis.

W. Dalrymple-Champneys⁴ has long contended that the real incidence of brucellosis is considerably higher than the reported incidence; and this fresh evidence of latent and undiagnosed brucellosis should make for increased awareness of the condition by doctors in agricultural districts, especially if a patient with pyrexia of unknown origin presents with symptoms of sweating, malaise, or limb pains.

PULMONARY EMBOLISM

The surgical treatment of pulmonary embolism has interested surgeons since the publication of Trendelenburg's original paper in 1908,¹ but the successful results published since then have been disappointingly few. P. R. Allison and colleagues² have recently drawn attention to the importance of the question, for they record 70 cases of pulmonary embolism as the cause of death in 838 necropsies (8%) on patients at the Radcliffe Infirmary, Oxford, in 1957. It would seem that with the advent of modern cardiac surgery, and the use of methods such as hypothermia and cardiopulmonary by-pass, better results should now be obtained, and Allison and his colleagues report the successful surgical treatment under hypothermia of a severe case of pulmonary embolism.

If the patients can be got to a thoracic unit in good time, the operation they describe should be repeatable more often. The difficulty, as always, is the diagnosis of pulmonary embolism. The cases probably fall into three groups. The first is sudden massive embolism without warning; usually the course of events is so rapid that nothing can be done to avert the patient's death. The second, and probably the largest group, includes patients in whom the symptoms of the pulmonary emboli are obscured by previous severe illness or major surgical procedures; the emboli are found at post-mortem examination. These patients are usually diagnosed as having terminal bronchopneumonia and die quietly without typical symptoms; the lung shadows are not diagnostic of an infarct but are usually consistent

¹ Black, J. M., and Sutherland, I. B., *Brit. med. J.*, 1961, **1**, 1732.

² Arblaster, P. G., and Prior, A. P., *Vet. Rec.*, 1956, **68**, 969.

³ Damon, S. R., Scruggs, J. H., and Parker, E. B., *J. Amer. vet. med. Ass.*, 1950, **117**, 39.

⁴ Dalrymple-Champneys, Sir W., *Brucella Infection and Undulant Fever in Man*, 1960. Oxford Univ. Press, London.

¹ Trendelenburg, F., *Zbl. Chir.*, 1908, **35**, 92.

² Allison, P. R., Durnill, M. S., and Marshall, R., *Thorax*, 1960, **15**, 273.

³ Lewis, I., *Modern Trends in Cardiac Surgery*, 1960, p. 56, Butterworth.

⁴ Marion, P., Tartulier, M., and Deleuze, R., *Sem. Hôp. Paris*, 1953, **29**, 4048.

⁵ Dible, J. H., *J. Path. Bact.*, 1958, **75**, 1.

with a diagnosis of basal bronchopneumonia. The third group includes cases in which there is a definite, fairly long history and sometimes an obvious cause. It is this group of patients to which special attention should be directed, because some of them ought to be successfully treated.

Owing to the difficulties of remedial treatment, prophylaxis is of paramount importance in this condition. The best prophylactic treatment is anticoagulation, but it is difficult to decide when to start. Opinions vary from giving anticoagulants to every patient post-operatively with physical signs in the legs, to giving them only to patients who have distinct signs of pulmonary embolism. This treatment is relatively simple and has the great advantage of not disturbing the patient unduly. If it is unsuccessful, ligation of veins has to be considered, but the choice of which veins should be ligated, and where, may be difficult. Ideally the inferior vena cava may be best, but ligation of this is a procedure which no surgeon embarks on with enthusiasm. The operation is safer if carried out at the level of the external iliac veins or, in some cases, perhaps even the common iliac veins. As to treatment of pulmonary embolism itself, I. Lewis³ has described several approaches. One of the easiest is to try to remove the clot through the left main pulmonary artery by means of a left-sided incision, rather than doing the original Trendelenburg operation into the pulmonary trunk. It was successfully used in two cases by P. Marion and his colleagues.⁴ If there is time, the ideal method of approach is the vertical sternal incision with occlusion of the superior and inferior venae cavae, thus giving the surgeon an empty heart; in this way the pulmonary trunk can be opened and the clot removed. Hypothermia will give at least eight minutes for this manoeuvre, and the point made by Allison and colleagues that the clot sometimes cannot be sucked out of the distal branches but has to be removed with forceps is very important, for this may take all the time available. Lewis has also investigated the size and diameter of the emboli that come up the inferior vena cava, and has developed a clip to place round it just below the renal veins to convert the vena cava into an oval tube not more than 5 mm. in antero-posterior diameter. In his experience fatal pulmonary emboli are over 7 mm. in diameter, and thus cannot pass the clip. The clip can be removed at a later date.

Allison and his colleagues also report an investigation into whether non-fatal pulmonary emboli are completely absorbed, and this work was carried out in the dog. The most important point they make is that the size of the clot found at

necropsy may be a poor indication of its size when it first reaches the lungs. By four days the clot was much smaller, and fairly soon "endothelium" started to grow over it. At the same time there was a striking dilatation of the vessels in the adventitia adjacent to the point of attachment. The clot progressively diminished in size and by 21 days was no longer recognizable in the elastic pulmonary arteries, though there were persisting focal areas of subintimal fibrosis. These workers concluded that the whole process was one of organization rather than canalization, as emphasized by J. H. Dible.⁵ By 28 days even the fibrous nodules had disappeared and there was an apparently normal vascular tree. Allison and his colleagues conclude that, if the experimental results are applicable to the clinical problems of pulmonary emboli in man, the most important deduction is that we cannot yet diagnose clinically a pulmonary embolism "unless it occurs either in the presence of previous severe pulmonary artery obstruction, or in the presence of pre-existing pulmonary venous congestion." They suggest that numerous small emboli undetectable by any normal means may precede a major embolism, and that only when a sufficient degree of obstruction to the pulmonary circulation has occurred would a further single embolus of moderate size cause the sudden symptoms that are observed clinically. This would fit in with pathologists' findings that in patients dying of pulmonary embolism smaller organizing thrombi are nearly always found.

The main question that remains unanswered is why apparently some emboli when they reach the lungs are rapidly absorbed and give rise to no symptoms, whereas others become impacted as plugs at various levels in the pulmonary tree and cause either infarcts or, when in the very large vessels, the death of the patient. A possible aetiological factor is the presence of stasis in the circulation. As Allison and colleagues point out: "It might well be, therefore, that the problem of pulmonary embolus is not the prevention or treatment of the single massive thrombus, but the counteracting of a process that is going on all day and every day as a natural result of operation."

RESUSCITATION OF THE NEWBORN BY COOLING

The multiplicity of methods advocated for resuscitation of the newborn shows that no one is manifestly superior to all others. Fortunately the majority of infants breathe spontaneously within a few seconds of birth, and, apart from ensuring a clear airway, no active measures are needed. But, in the minority where spontaneous respiration is slow in starting, the choice