PARACOLON BACILLUS INFECTION CAUSING CHOLECYSTITIS AND SUPPURATIVE HEPATITIS

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In the following case, which occurred after an attack of dysentery, the somewhat rare sequels of acute cholecystitis and suppurative hepatitis developed, and a paracolon bacillus was recovered from the blood stream and from the gall-bladder during the infection and from the lesions in the liver at necropsy. This organism did not seem to be identical with *Bact. asiaticum*, but appeared to produce an infection of an equal if not a greater degree of virulence.

Case History

An officer aged 36 was admitted to a British general hospital in Calcutta on June 7, 1945, complaining of acute pain in the right hypochondrium, which had come on suddenly ten hours previously. He had vomited several times. There was no history of dyspepsia or biliary colic. He had served in India for thirteen months, and his only other illness had been an attack of "clinical dysentery" eight weeks previously.

On admission he was in obvious pain and very distressed. The temperature was 101.4° F. (38.55° C.), pulse 102, and respirations 20. There was tenderness in the right hypochondrium, with guarding of the muscles of the right upper quadrant but no rigidity. The urine contained no albumin or sugar, but there was a deposit of phosphates. No other abnormal physical signs were elicited. A diagnosis of acute cholecystitis was made. The following day he was still in pain and lay curled up on his right side. By the next day rigidity of the muscles of the upper right abdomen had developed.

Operation (Lieut.-Col. Leedham-Green).—The liver was normal but the gall-bladder was seen to be plum-coloured and distended. Aspiration of the gall-bladder yielded pus. The common bile duct was normal in colour and not dilated. Cholecystectomy was performed and the abdomen closed with drainage. The common bile duct was not explored. On opening the removed gall-bladder viscid pea-green fluid was found but no mud or stones. The mucosa was not grossly ulcerated.

Histological Report.—Microscopically, section showed ulceration of the mucosa and infiltration of the whole thickness of the wall of the gall-bladder with inflammatory cells. The capillaries were distended and hyperaemic. The submucosa and muscular layers were oedematous and packed with polymorphonuclear leucocytes. Pus from the gall-bladder yielded an atypical (anaerogenic) paracolon bacillus in pure culture.

Post-operative Course.—On the day after operation it was disturbing to find the patient drowsy and still complaining of the pain in his right side, which was as severe as before the operation in spite of the removal of an obviously diseased gall-bladder. This pain diminished gradually during the days that followed, but it was difficult to assess its intensity accurately since his drowsiness was succeeded by increasing restlessness with intervals of delirium. For the first few days after operation his temperature remained around 101° F. (38.3° C.) and subsequently swung between 97° and 100° F. (36.1° and 37.8° C.). Blood culture on June 14 yielded an anaerogenic paracolon bacillus which appeared to be identical with the organism from the gall-bladder. A blood count on June 18 showed: R.B.C., 3,430,000; W.B.C., 6,800 (polymorphs 76%; lymphocytes 24%). A course of sulphamezathine (total 54 g.) produced no clinical improvement, although a second blood culture on June 20 was negative. By June 27 he had become jaundiced and bedsores had developed over the sacrum. Increased

tenderness over the lower border of the liver was again noticed. He died on July 11, 32 days after operation.

Post-mortem Report.—The liver was enlarged (weight 8½ lb.—3.74 kg.) and of a mottled grey-green colour. The cut surface showed small haemorrhagic areas alternating with pale areas in an irregular pattern. Scattered throughout the liver substance were friable necrotic areas containing yellowish-green material which appeared to be a mixture of pus and bile. The hepatic and common bile ducts contained thick, viscid green bile. The mucosa of the ducts was deeply stained with bile and appeared to be chronically inflamed. There was no obstruction to the flow of bile, which was found staining the food residue in the stomach. The spleen was enlarged and friable. The kidneys were congested. Evidence of embolic spread to other sites was not seen and no significant changes were found in the other organs. Microscopical examination of the liver revealed multiple pyogenic abscesses scattered throughout its substance. Parenchymatous cells had survived in small areas, but those on the periphery of the abscesses showed an advanced degree of fatty degeneration. The bile ducts near the abscesses were filled with bile and polymorphonuclear leucocytes. In those areas where normal liver tissue survived, the portal and central hepatic veins showed no pathological change. Section of the spleen and kidney revealed no evidence of embolic spread of infection.

Bacteriology.—The organisms recovered from the aspirated contents of the gall-bladder and from the blood had identical characters. Each was a Gram-negative motile rod and formed a pellicle on incubation in broth. Each gave identical biochemical reactions as follows:

Lactose ..	A	Maltose ..	A	M.R. ..	—
(slow: 48 hrs.)		Saccharose ..	A	V.P. ..	—
Glucose ..	A	Dulcitol ..	—	Citrate ..	—
Mannitol ..	A	Indole ..	+		

A = production of acid. No gas was produced in any carbohydrate on incubation up to 21 days.

Serological Reactions.—Neither organism was agglutinated by the stock *Salmonella* sera (including a non-specific *Salmonella* serum containing the common antigenic components of the group) nor by the stock dysentery-group sera. Against the patient's own serum agglutination occurred as follows:

Serum	June 22		June 29		July 10	
	Patient	Control	Patient	Control	Patient	Control
Organism B ..	1/500	Nil	1/1000	Nil	1/2500	Nil
Organism G ..	1/500	Nil	1/1000	Nil	1/2500	Nil

Organism B isolated from blood culture, organism G from gall-bladder.

An organism isolated at necropsy from one of the abscesses in the liver had identical biochemical reactions and was agglutinated by the patient's serum to a titre of 1/500. Facilities for the antigenic analysis of these organisms were not available.

Judged by its biochemical reactions the organism appeared to belong to the paracolon group. Numerous workers who have studied the paracolons (Dudgeon and Pulvertaft, 1927; Fothergill, 1929; Jones, Orcutt, and Little, 1932; Kennedy, Cummings, and Morrow, 1932; Sevitt, 1945) have experienced difficulty in classifying them. In our case the organism seemed to be related to Group B of Dudgeon and Pulvertaft's classification or to Group IV in that of Sevitt. According to Sevitt, organisms of Group IV are antigenically heterologous and not antigenically related to the Flexner bacilli nor to *Bact. alkalescens* as are certain other strains of paracolon bacilli.

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