

Adami (J. G.)

Upon a case of foaming liver

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UPON A CASE OF FOAMING LIVER (SCHAUMLEBER) WITH  
THE DEVELOPMENT OF GASEOUS BULLÆ IN VARIOUS  
ORGANS, DUE TO THE PRESENCE OF THE  
BACILLUS AEROGENES CAPSULATUS.<sup>1</sup>

BY

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While I have to confess that I have nothing new to add with regard to this interesting form, the bacillus aerogenes capsulatus, about which Professor Welch and Dr. Flexner are issuing a full study in the new *Journal of Experimental Medicine*, and while I have to confess further that I have been so much occupied with other work that I have not been able to make a full study of the case, nevertheless, inasmuch as I believe I am recording the first in which this form of anerobic microbe has been recognised in Canada, I may possibly obtain forgiveness if I publish a brief note upon the case.

A. C., aged 45, a strongly built lumberman, had for the past five or six years suffered from dull aching pains in the loins. He was a temperate man and had no other complaint.

While drawing wood four weeks previous to admission he felt a soreness over the whole body, but continued at work. Upon the following day, the soreness gave place to actual pain, localised in the abdomen and loins. The pain was so severe that at noon he ceased work and took to his bed. The pain became at times agonizing, but never became localised to any spot in the abdomen. He suffered from recurrent chills, his urine became very red (? bilirubin) and a week before entering he became jaundiced. Upon April 9th he was admitted to the Royal Victoria Hospital, under Dr. Bell, to whose house surgeon, Dr. Anderson, I am indebted for these notes.

Upon admission the patient complained of no pain, but only of extreme weakness. Despite the fact that he had been ill for four weeks, he still preserved a well nourished and muscular appearance. There was the anxious abdominal facies, with moist perspiring icteric skin. The temperature was 102°, the pulse 120, the respiration 28.

The abdomen was pendulous, and there was tenderness over the whole, particularly over a small area, 3 inches to the left and 5 inches above the umbilicus, where percussion was dull and an indistinct mass

<sup>1</sup> Read before the Montreal Medico-Chirurgical Society, April 17, 1896.



could be felt. There was some tenderness also in the left groin. The urine contained albumen and bilirubin, the fæces were liquid and dark, containing blood and pus cells.

Shortly after admission the patient vomited coffee ground vomit, and continued to vomit thus until his death, 5 days later. The patient continued so weak that it appeared hopeless to attempt any operative interference. Upon the 14th he was coughing constantly, and was in great pain. The pulse was weak and rapid. The abdomen was distinctly enlarged and tympanitic, and the enlargement appeared to be progressive. The tympany extended for about  $1\frac{1}{2}$  inches above the edge of the liver, which could at this time be distinctly palpated. The blood upon the 14th exhibited great leucocytosis, the red corpuscles did not form into rouleaux and there was marked poikilocytosis. On the 15th the patient died.

The body was placed in the cold chamber, and the necropsy performed 28 hours after death. The necropsy revealed that there had been a perforative appendicitis. Below the cæcum in the pelvis, between it and the rectum, was an abscess of the size of a large tangerine orange. Into this abscess passed the appendix, which had ruptured at the junction of the 1st and 2nd fourths. The gangrenous distal portion of the appendix lay in the abscess cavity. The abscess was sharply defined. The mesentery of the small intestine was very thick and fat, and upon cutting through it in removing the intestines occasional small foci of pus were cut across. Upon further examination these foci were found to be linear, and the pus to be in and around the branches of the superior mesenteric vein. Deeper down in the mesentery was an extensive sloughing abscess cavity, its branching corresponding to the mesenteric vein. The superior mesenteric appeared to open into this abscess cavity, its terminal and upper portion alone being clearly recognisable. The abscess cavity extended up to the head of the pancreas and the duodenum, and in the third part of the latter was a fine perforation leading into the abscess cavity.

Evidently, therefore, we had here to deal in the first case with a case of appendicitis, which possibly taking into account the history of long continued soreness and pains in the lower abdomen, may have been of the recurrent type. Eventually there had been perforation and localised suppurative peritonitis and abscess formation, with suppurative thrombosis of the branches of the superior mesenteric vein, and this thrombosis had grown along other branches of the vein, and had led eventually to a condition of retroperitoneal abscess.

But there had been further changes. Bubbles of air or gas were

noticed in the veins of sundry of the abdominal viscera. Unfortunately there exists no note as to whether also the presence of air was noticed in the coronary veins. My impression is that I distinctly noticed this condition, but in the absence of any definite note I can affirm nothing surely. When, however, the liver was removed it was found to float high out of the water, and the same was noticed with regard to the kidneys and to a somewhat less extent, in connection with the spleen. It should also be added that the abdomen was found greatly swollen, even more so that it had been at the time of death, and upon opening it there was an abundant exit of gas. The liver was not much above the normal size, and presented rounded edges. Its surface was smooth with a dark slaty background, mottled over thickly with pale yellowish circular patches, 2 to 5 mm. across. On section it was extremely emphysematous, and crackled on pressure, and when a lighted match was brought close to the cut surface and pressure was exerted upon the organ, the expelled gas caused a series of minute explosions. The cut surface had a reddish-brown colour on the whole, but varied from bright red to even a greenish tinge. It exhibited numerous small whitish areas of necrosis, with softened centres, and also numerous sharply defined bullæ (where the gas had been); these averaged 3 to 5 mm. across. It was noted that although the mesenteric exhibited so extreme a condition of suppurative thrombosis, no thrombi were to be seen in the large vessels of the liver.

The spleen was large, soft and almost diffuent. It had a slightly emphysematous feel, but presented no clearly marked bullæ. The kidney also showed no large bullæ although it floated so easily; there were, however, numerous whitish areas of necrosis or abscess formation level with the surface, and resembling those seen on the surface of and in the liver. On section, the cortex was plainly swollen, with similar areas both in the cortex and in the medulla. Bacteriologically the surface growths gave in the main, colonies of a minute diplococcus. A deep agar lactose tube showed in 24 hours a slight growth along the needle track away from the surface. In 48 hours, the deep growth was more distinct and one bubble of gas was well developed. In 72 hours there was abundant development of gas bubbles, but now in the upper part of the needle track there was a development of the same minute diplococci which had been seen in the previous cultures. Preparations made by breaking the tube and taking material only from the lower portion of the growth gave large bacilli corresponding in every respect with those described by Welch as the *B. aerogenes capsulatus*.

Sections of the liver and other organs showed large colonies of this same large bacillus corresponding to the areas of necrosis recognised by the naked eye ; but there was very faint evidence of the presence of the capsule, even when preparations were made by Welch's method of demonstrating the capsules. At most where the bacilli were crowded together, a faint delicate halo could be seen surrounding each individual. Welch and Flexner have, however, called attention to the fact that the capsule is not constantly recognisable.

That the bacillus in this case had commenced to grow in the tissues ante-mortem is shown in the first place by the development of tympanites on the day preceding death. In the second, I take it, by the localised growths in the liver and kidney, these growths corresponding to the localised necroses in these organs. At the same time it is clear that in this as, if I mistake not, in all cases, the presence of this gas producing germ was of the nature of a secondary infection, and indeed I am inclined to doubt whether under ordinary conditions the bacillus can grow in the human organism without the simultaneous presence of aerobic microbes. This, perhaps, would seem to be contrary to the experience gained by inoculating pure cultures of the germ into the lower animals ; yet it must be remembered that the conditions of such inoculations, the number of microbes and also the amount of products of growth injected form, taken together, a very different process to that which must occur in natural infection.



