SPONTANEOUS RUPTURE OF AN APPARENTLY NORMAL SPLEEN

BY

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Spontaneous rupture of an apparently normal spleen is rare enough to warrant publication. Susman (1927) had a case in a man aged 53 and reviewed the literature of 8 previously reported cases. His patient had had indigestion and flatulence for three months, and indigestion had been a feature of four out of the six cases he reviewed. He suggested that in the spleen there was a localized lesion which was itself destroyed by the bleeding and which was the cause of the dyspeptic symptoms. He stressed a relationship between splenic and gastric activity.

Later Hamilton Bailey (1930) reported a further case of spontaneous rupture in a man aged 20: the spleen was normal on macroscopic and microscopical examination. He reviewed the cases reported by Susman and found a further two in the literature, bringing the total to 12. Hamilton Bailey felt that "forgotten trauma should be accepted as the cause. If that theory is discarded we are plunged into a morass of speculation in which it is unprofitable to linger."

Black (1933) reported a case in a woman aged 52. The sudden onset of severe abdominal pain was preceded by some weeks' uneasy feeling under the heart. She was found to have an intraperitoneal haemorrhage from a ruptured spleen. The spleen was normal in size, and microscopy showed hyalinization of the wall of the central artery. Black said that the spleen aged early, that at 36 years 50% of spleens show hyaline vascular change. He believed this change rendered it liable to haemorrhage and that torsion of the pedicle was the immediate cause in his case.

Zuckerman and Jacobi (1937) added a further case, in a woman aged 39. They reviewed the preceding cases and found further records in the literature, bringing the total reported to 22. In their patient the spleen was abnormally mobile owing to the absence of the lieno-phrenic ligament. Similar findings were present in the case reported by Halliwell (1933). Zuckerman and Jacobi pointed out that the condition is apparently uninfluenced by sex or age. Two of their cases occurred under the age of 20, and those remaining were more or less evenly distributed in each decade from 20 to 60. This age distribution, they felt, was strong evidence against vascular degeneration being the causative factor. They suggested that the common factor was venous congestion due to kinking of an unusually mobile splenic pedicle. This was due to a developmental defect in the peritoneal relations of the spleen resulting in the absence of the lieno-phrenic ligament.

Coleman (1939) had a further case. His patient was a man aged 58 with a long history of previous indigestion. The spleen was normal in size. The histological report stated that there was well-marked arteriolar sclerosis, and the haemorrhage may have been due to rupture of one of the damaged vessels. Coleman suggested that disturbance of gastric function caused congestion of the portal vein and its radicles and led to rupture of a damaged vessel.

Dubash and Langley (1944) reported spontaneous rupture of the spleen occurring in a patient in bed suffering from an acute axillary lymphadenitis. Although this spleen showed an acute inflammatory reaction and cannot be considered normal, it is of interest to note that it was abnormally mobile.

Case Report

A soldier aged 36 was admitted to an Emergency Hospital at 7 a.m. on Sept. 18, 1943. His leave had started on the 17th, and he spent his day travelling. He left his unit at 7 a.m. and reached his home at 1 p.m. He had no food on the journey, but had a midday meal on arrival home. He then had a light tea, followed later by supper. At the last meal he had celery. He went to bed at 10 p.m. feeling perfectly well, but within a few minutes he had abdominal pain, which became very severe, reaching its maximum intensity within two minutes. The pain was on the left side of the abdomen between the lower ribs and thigh, being described as a burning sensation running from above downwards and continuing

without remission. He felt sick, and vomited once immediately after the pain started. His bowels were regular. He had never had indigestion. Micturition was normal.

On examination the patient was half sitting and half lying, curled up on his left side. Any movement from this position was resented. His general condition and colour were good. The temperature was 98.4° and the pulse 70. The abdomen was tender and rigid, especially in the left upper quadrant. The percussion note was normal. No peristalsis was audible.

A diagnosis of perforated gastric ulcer was made and a laparotomy undertaken. As the pain was most severe on the left side a midline incision was used to open the abdomen. On entering the peritoneal cavity large quantities of blood escaped. The bleeding was found to be coming from the spleen, and after extending the incision laterally to the left costal margin a splenectomy was carried out. Clots and the bulk of the fluid blood were removed; the other abdominal viscera were normal, and the incision was closed. The patient's post-operative condition was good and no transfusion was necessary. His progress was uneventful until the third week. He then had some pain and tenderness in the left hypochondrium accompanied by slight fever, the temperature rising to 99°. This was possibly due to injury to the tail of the pancreas; the condition subsided in about ten days.

On Sept. 27 the blood count was: R.B.C., 3,330,000; Hb, 60%; colour index, 1.03; W.B.C., 10,400—polymorphs 70%, lymphocytes 26%, large mononuclears 1%, transitionals 0%, eosinophils 2%, basophils 1%. The anaemia was believed to be due to blood loss, so the patient was given iron by mouth. On Oct. 11 his red cell count had risen: R.B.C., 4,320,000; Hb, 74%; colour index, 0.89; W.B.C., 7,600. No malaria parasites were seen in thick films. Blood pressure, 138/74.

After operation the patient was closely questioned to find out whether the rupture could be accounted for by injury. Three months previously he had fallen against a tap and struck his right side. His lower ribs had been painful for a month, but the pain was never bad enough to make him report sick.

The spleen was normal in size and consistency. At the junction of the upper and middle thirds of the cut surface the pulp showed six or seven small haemorrhages about the size of a pea. One of these areas on the convex surface communicated with an extensive subcapsular haematoma. The capsule had a large rent through which the blood reached the peritoneal cavity.

Dr. J. L. Edwards, who examined the spleen, reported on its histology:—"The Malpighian bodies are well defined. The central arteries are hyaline. There has been recent haemorrhage into the pulp. There is a reticular increase in the pulp. No malaria parasites are seen in Giemsa preparation. Eosinophil leucocytes are fairly numerous in the pulp."

Discussion

In the light of previous reported cases the main points of interest of this case are: (1) the naked-eye appearance of the haemorrhage in the spleen; (2) the history of previous trauma; (3) the absence of previous dyspepsia; (4) the presence of degenerative changes in the blood vessels of the spleen; (5) the spleen was not abnormally mobile.

It is suggested that the appearance of multiple haemorrhages was misleading and that there was one haemorrhage burrowing in the splenic substance, stripping the capsule and bursting into the peritoneum. The appearance of multiplicity was due to cutting the tortuous haematoma in several places. The only previous trauma to the lower chest and abdomen occurred three months earlier. The pain was confined to the right side of the lower chest and did not stop the patient from working. On subsequent examination the spleen failed to show either adhesions or evidence of old haemorrhage.

Although this patient had had no previous indigestion he had been travelling most of the day and had eaten mainly vegetables. He himself attributed his misfortune to eating celery. At laparotomy stomach, duodenum, and gall-bladder were found to be normal.

The blood vessels of this spleen showed well-marked hyaline change. It is probable that the underlying cause in all cases of spontaneous rupture of the apparently normal spleen is an intrasplenic haemorrhage. This may be a ruptured vein or splenic sinus following congestion. In many cases congestion has been noted. The cause of the congestion probably varies. Different causes have been cited—viz., partial torsion or kinking of an unusually mobile pedicle (Zuckerman and Jacobi, 1937; Halliwell, 1933; Black, 1933; Dubash and Langley, 1944), pregnancy (Burnett and McMenemey, 1935),

hepatoma (Dardinski, 1932), or recent thrombosis of a splenic vein (Rhame, 1928).

It is probable that in some cases there is an arteriolar rupture. The splenic artery degenerates early. Black states that at 36 years 50% of spleens show degenerative changes. The splenic artery may show gross degenerative changes with aneurysm formation when the rest of the arteries in the body are normal (Parsons, 1937).

In the case reported above the spleen was not abnormally mobile—there was no evidence of venous obstruction, and in view of the arteriolar degeneration present it is possible that the haemorrhage was arteriolar in origin.

Summary

A further case of spontaneous rupture of an apparently normal spleen is reported and a brief review of the literature is given. It is suggested that rupture is secondary to an intrasplenic haemorrhage. It is unlikely that any one common cause of the haemorrhage will be found to explain all cases.

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PNEUMOPERITONEUM

BY

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The term "pneumoperitoneum" is used to describe the presence of free gas in the peritoneal cavity without evident peritonitis. The condition is regarded as rather a curiosity, but d'Allaines (1932) was able to analyse 34 published cases, and to add one from his own experience. The fact that three cases can be reported here, all of which were observed within the space of a few months, suggests that spontaneous pneumoperitoneum is not really very uncommon, and that to be aware of the existence of the syndrome is to make it likely that one will observe it.

Case I

An unmarried woman aged 30 was admitted to the Royal Northern Infirmary under Dr. T. N. MacGregor for removal of fibroids of the uterus. Her previous health had been good except for dyspepsia for several years. She developed a post-operative collapse of the right lung with secondary infection. This was treated with sulphanilamide, but resulted in a small right-sided pleural transudate (sterile). After this had subsided she complained of a sharp pain in the right side, had a rise of temperature to 101° F., and x-ray screening (Dr. G. Gottlieb) showed gas beneath the right diaphragm (which had not been present in previous radiographs). She had some tenderness and some muscle spasm in the upper abdomen, and there was complete disappearance of liver dullness. Her general condition, however, was not that of generalized peritonitis. Further treatment with sulphadiazine was given, and after four days her temperature was normal and symptoms absent, but there was still some abdominal tenderness. This gradually disappeared, and she was discharged from hospital. She was x-rayed again three weeks later (Dr. Gottlieb), and gas was still to be seen below both domes of the diaphragm. There was an ill-defined pyloric antrum with some deformity and stiffness, apparently due to adhesions. The duodenal cap was deformed, probably from adhesions to the gall-bladder. No ulcer crater was seen. The emptying time was delayed, with a moderate two-hour residue. The appendix was partially filled, fixed to the midline, and tender on palpation.

This patient reports, 18 months later, that she has since remained in good health.

Case II

A married woman aged 60, with six children, was admitted to the Royal Northern Infirmary for attacks of abdominal pain with nausea and occasional vomiting, constipation, anorexia, loss of weight, and attacks of diarrhoea preceded by severe abdominal pain, the stools being fluid and dark, without excessive mucus. Her

general condition was good except for recent loss of weight. Her complexion was sallow. Red cells numbered 4.8 millions, with haemoglobin 89%. The heart action was normal except for extrasystoles. Stomach splash was present three hours after food. The benzidine test was consistently positive in stools. Fractional test meal: Maximum free acid, 0.15%; traces of blood throughout; starch present to the third hour. Radiograph (Dr. Gottlieb): ptosis of the stomach with no clear definition of pylorus or duodenum; a large residue of barium present at four hours; gas seen below both domes of the diaphragm.

At this time there was no tenderness, distension, or rigidity, and little discomfort. She was kept in bed, given a diet largely of milk and regular gastric lavage, and was x-rayed again three weeks later, when the appearances were much the same, though an ulcer crater could be seen at the base of the deformed duodenum. A large barium residue was seen at five hours (Dr. Gottlieb). After further gastric lavage the residue steadily diminished and the patient was symptomless. She left hospital to continue under observation as an out-patient.

Over a period of about four months she was seen at intervals of a few weeks, her only symptom being a feeling of abdominal distension "towards the evening, when there was a sensation as of something crackling." She was readmitted, however, four months after her discharge in a coma from alkalosis following several days of repeated vomiting. Tetany was present. Blood urea was 220 mg. and blood calcium 6.8 mg. per 100 c.cm. Intravenous glucose-saline rapidly improved her condition, and she later submitted to gastro-enterostomy (Mr. A. J. Hamilton), from which she made an uninterrupted recovery. Operation showed a narrow scarred pylorus, but no signs of perforation.

Case III

An unmarried woman aged 35 was referred to me in 1941 for abdominal pain of irregular occurrence, but sometimes of the hunger type and relieved by food; the pain had prevented her from working as a cook for 10 months. She had been previously studied, without a positive diagnosis being made, at the Glasgow Western Infirmary. Her general condition was good. No physical signs were found. A fractional test meal showed a maximum free acid of 0.11%, with starch present to the third hour. Radiographs (Dr. Campbell Tainsh) showed a normal oesophagus, stomach, and duodenum, with no gastric residue at six hours; the appendix was not outlined. No blood was found in test meal or stools.

A year later she was admitted as an emergency to the Lawson Memorial Hospital, Golspie, under Mr. B. S. Simpson, with abdominal pain and distension of three days' duration. She was in a state of surgical shock. General restorative measures and the passage of a flatus tube improved her condition, but the next day there was increased distension and pain. At operation, as soon as the peritoneum was opened, there was an outrush of non-odorous gas and the abdomen became deflated. No evidence of peritonitis was found, nor could any other lesion be discovered. A caecostomy was carried out. After operation she was in good condition for a few hours, but there was then a recurrence of pain and distension, with deterioration of her general condition, and the abdomen was reopened 48 hours after the first operation. Once again there was an outrush of odourless gas and no evidence of obstruction or peritonitis. The abdomen was closed, and on the following day there was once more an acute recurrence of pain and distension. A needle was inserted in the posterior axillary line beneath the ninth and tenth ribs, and there was a prompt outrush of gas, with complete relief of symptoms.

There was no further recurrence of symptoms. The patient made an uneventful recovery and the caecostomy wound was closed. I saw her at the Lawson Memorial Hospital at this time and could detect no physical signs. She was admitted to the Royal Northern Infirmary two weeks later for further study, and immediately after admission developed a pain beneath the ribs on the left side which was worse on taking a deep breath and prevented her from sleeping. The abdomen was slightly distended and tender on the left side of the epigastrium. These symptoms disappeared after a bowel movement, and subsequently there was no further pain or distension. The patient was afebrile. Radiographs (six weeks after the first symptoms) showed no abnormality in oesophagus, stomach, and duodenum, and no evidence of gas beneath the diaphragm (Dr. Campbell Tainsh).

Comment

It will be noted that these three patients were women, and I have only been able to discover a report of one male case—that of d'Allaines (1932)—and no case in childhood. All the patients described here and a great majority of those reported elsewhere have had previous symptoms referable to the gastro-intestinal tract, usually suggestive of ulceration. The gas in two analyses quoted by d'Allaines (made by Montmollin and Urban) was atmospheric except for a rather higher content