became alkaline and after thirty-two hours' treatment was free from sugar.

Insulin was then omitted for twelve hours, but sugar reappeared; after 10 units there was still much sugar, and 30 units were then given every two and a half hours for the next twelve hours, when he again became almost sugar-free; insulin was reduced to 20 units every two hours for the next twelve hours, when he became sugar-free. The insulin was again reduced to 10 units every two hours for the next sixteen hours; in the first eight hours there was a trace of sugar, but none in the last eight hours. The continuance of insulin so frequently after the disappearance of sugar was due to a misunderstanding. At the end of seventy-eight hours he had received 730 units of insulin with glucose. He was no longer drowsy, his pulse was good, and respirations were normal. He had taken some protein food and said he felt well.

On February 4th, seventy-eight hours after admission, he had been reading the paper when he suddenly began to "look strange"; the house-surgeon, Dr. Durden Smith, found him lying on his back, his colour good, eyes closed, and pulse full and slow; he did not answer nor show any sign of consciousness. Suddenly he uttered a long cry, the face twitched, and spasms began round the mouth, spreading to the other facial muscles; there was marked nystagmus to the right. The spasms spread to the arms and finally became general, ending in complete tonus and opisthotonos. He stopped breathing, frothed at the mouth, and became very blue; the tonus then relaxed, and the pulse became feeble. Artificial respiration was resorted to and maintained for ten minutes; 2 ounces of urine were drawn off and found to be sugar-free. A sterile solution of glucose (15 grams in 100 c.cm.) was run into the median basilic vein. After this he breathed naturally and spasm ceased. He was still deeply unconscious, and 15 grams more of glucose were run in. He regained consciousness rapidly, and, when asked how he was, replied that he was all right, as if surprised at the inquiry. No further convulsions occurred. He remembered nothing of these events and denied having any premonitory symptoms whatever. Sepsis developed in the arm.

This severe condition of hypoglycaemia and its treatment, combined with the sepsis, completely upset his sugar tolerance. It took a week's careful treatment to get his urine free from sugar and ketone bodies; 10 units of insulin had usually to be given every two hours, but sometimes 30. Eventually he went out of hospital sugar-free without insulin on a diet of 9 lines of Dr. Lawrence's "line ration" scheme, gaining weight and feeling well.

The chief points of interest in this case are:

The rapid progress of the disease in the last few days before his admission, with no discoverable cause.

The hypoglycaemia, due undoubtedly to the error in administering insulin in repeated doses for so long after the urine was sugar-free, followed with dramatic suddenness by convulsions, coma, and collapse.

The rapid and effective cure of this condition by the application at once of the correct treatment.

The difficulty of establishing sugar tolerance again, which was probably in large measure due to the sepsis.

The satisfactory condition of the patient when he left the hospital.

RUPTURE OF THE HEART:

AN ANALYSIS OF EIGHTEEN CASES.*

BY

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EMOTIONAL strain, such as anger, sorrow, or disappointment, has been known to cause rupture of the heart, but a critical analysis of the following eighteen cases reduces the exciting cause to a more material basis, for, of the eighteen cases here presented, in only four could the exciting cause be called emotional.

The results of the following analyses are unexpected, for certainly the emotions of everyday life provide by far the greatest strains to which the cardio-vascular system is subjected.

Many years ago a man presented himself for treatment in the out-patient department of a hospital in London complaining of shortness of breath and pain in the chest on exertion. A physician, after a somewhat lengthy examination, electrified his audience by saying that he thought the man had an aneurysm of the left ventricle; this was long before the days of *x* rays. Treatment was

prescribed, and the man was leaving the hospital when at the front gate he suddenly collapsed. At the necropsy a tear in the left ventricle was found, secondary to a gummatous infiltration.

A male guinea-pig had been kept for some months in a small cage in a room by itself. One day an attendant placed the cage in another laboratory near a cage containing a female guinea-pig; the male appeared overcome by excitement, gave a chirp and fell over dead. The heart was found to have ruptured.

An old lady had a small dog, which she took for a walk. The dog strayed into the road, and the old lady became exceedingly worried, but finally rescued it. She felt faint and ill with excitement, but walked home; she complained of pain in her chest, went to bed, and declined any dinner. Next day she did not appear for breakfast, and was found lying dead on the floor. Her heart was found to have ruptured, and there were several tears in the ventricular wall, containing clot; she had apparently lived for some hours after the rupture.

A man who had spent the evening at his club, where he appeared to be in his usual health, went out into the cold air and started to walk home. He suddenly collapsed, became cold and pale, and practically pulseless. He was taken home, and his doctor, on arrival, thought the man was dying, and said that the case looked "like a ruptured extrauterine"; he considered the man so nearly dead that he did not think anything could be done for him. Next day, however, the man was much better, and steadily improved. On examination the cardiac dullness was found to be increased, the heart sounds were exceedingly feeble—almost inaudible—and the base of one lung was dull. The man admitted that he had had a cough for some days before, and had been short of breath. I came to the conclusion that he had an effusion into the pleura, and possibly into the pericardium. It was fully realized at the time that this theory of pleurisy did not explain the sudden collapse in the street, and the question of a ruptured aneurysm was considered. The pleura was tapped, and about a quart of blood-stained fluid was withdrawn; the heart sounds were still distant and the base of the lungs dull, but the man seemed easier. The following day the pleura was again full; the man, however, was improving, so nothing further was done. He appeared to progress for over a fortnight, when, on sitting up and attempting to sing, he fell back dead. He was found to have a small tear in the upper part of the left ventricle, close to the aorta; this had allowed blood to leak into the pericardium, and also into the pleura.

In this series of cases, encountered during a period of many years, there are points of special interest.

The first case shows the accuracy with which a diagnosis could be made by a careful, painstaking, and skilful physician.

The case (of the guinea-pig) appears particularly interesting because it suggests the possibility of the rupture of a healthy heart, at any rate in an animal out of condition and under a violent emotional strain.

The last two cases are of interest because they show that rupture may be associated with pain, and that it may be possible for people to live for a considerable time after an extensive rupture has actually occurred.

The following short histories, with the *post-mortem* findings, relate to a further series of fourteen cases with which we have come in contact.

A man, aged 75, had malaria in South Africa in 1903. One morning in January, 1924, he had breakfast in bed and slept afterwards. Shortly after noon he was found fully dressed lying dead on the floor. The heart weighed 17½ oz., and was soft, pale, and fatty. There was a tear 1½ in. long in the anterior wall of the left ventricle. The aorta was markedly atheromatous and the coronary arteries were calcified.

A woman, aged 74, gave a history of "heart trouble" for fifteen months. She had once "collapsed" while shopping, and about two months later she collapsed again and had to sit on the stairs all night (alone in the house). She was seen, apparently well, in bed one afternoon, but was found dead in bed the same night, lying in a natural position with the clothes undisturbed. The heart muscle was dotted with fibrous patches. At the apex of the right ventricle the wall was very thin and there was a deposit of *ante-mortem* clot. The wall had ruptured in this position. The coronary arteries were calcified.

A man, aged 71, previously in good health, contracted a cold and at times during the following three weeks suffered from giddiness without fainting, and from bronchitis during the last week. He had breakfast one morning, felt much better, and said he would go for a walk; while walking through the yard he staggered and fell. There was a heart tear in the posterior wall of the left ventricle. The coronaries were calcified and almost obliterated. The muscle was stippled with white patches.

A clerk, aged 59, who had been fairly healthy a few days before his death, complained of acute pains in the chest and back. On the day of his death he worked without complaint; about 5.30 p.m. he went to the lavatory and was found there dead about ten minutes later, huddled on floor, face downwards. The heart was not enlarged; there was a ragged tear in the anterior wall of

* A demonstration of specimens from this series of cases was given at the Annual Meeting at Nottingham on July 23rd, 1926.

the left ventricle two-thirds of the way down. The muscle was pale and soft. The left coronary was blocked close to its origin by a clot due to atheroma. The aorta was healthy.

An army pensioner, aged 75, who had had good health previously, complained of pains in the chest one day, but did not see a doctor. The next day he was better, and continued his work as doorkeeper. Three days later he complained of pain in the chest and was later found dead in a lavatory. There was rupture of the anterior wall of the left ventricle. The left coronary artery was completely blocked just above the rupture. Both coronaries were calcified, and the muscle was pale and soft.

A man, aged 71, apart from weakness owing to age, was healthy. He was found lying dead face downwards. The heart showed a small rupture of the anterior wall of the left ventricle; the muscle was very soft and the coronary artery was very calcified.

A man, aged 63, who had complained of pains in the chest for a considerable time, was found lying dead in bed. The heart weighed 19 oz., and was pale, soft, and flabby. There was a tear in the anterior wall of the left ventricle. The left coronary artery was calcified and blocked by atheroma just above the tear. The aorta was atheromatous.

A man, aged 69, had had fairly good health, except for gout and ulcerated legs. One morning he was heard by his landlady moving about his room. She later heard a thud and found him lying on the floor, partly dressed, and unconscious. The fibrosed heart weighed 17 oz., and there was a rupture in the anterior wall of the left ventricle. The coronaries were sclerosed, but no obliteration was found.

A retired railway guard, aged 69, had had good health except for a "seizure" four years previously, when the mouth was drawn to one side (cerebral vessels sclerosed). He had had slight indigestion since. On returning home one evening in June he complained of the heat and of pain in the side. A quarter of an hour later he attempted to get up from his chair and collapsed. The heart weighed 22 oz., and there was a rupture 1 in. long in the anterior wall of the right ventricle. The coronaries were sclerosed and the aorta was atheromatous.

A man, aged 86, previously healthy, complained of "a lump in the chest" and flatulence. A week later he got up at 6 a.m. to make tea, drank a cup, returned to the bedroom, told his wife he felt too ill to give her a cup, and lay down. He had attacks of spasms, and at 7.30 suddenly got off the bed and fell down unconscious. The heart, which weighed 22 oz., was very soft and pale. The coronaries were sclerosed, the aorta very atheromatous with diffuse aneurysmal dilatation of the thoracic portion. There was a rupture in the anterior wall of the left ventricle.

A man, aged 72, formerly a sawyer, had had bronchitis for some years, and more recently complained of pains in the chest. Apparently all right at 8 a.m., he was found lying on the floor dead about 10.30 a.m. The heart weighed 18 oz. The left ventricle was hypertrophied, and had a tear 1 in. long in the posterior wall. The coronaries were sclerosed, but the aorta was healthy.

A locksmith, aged 72, had suffered from cough and pains in the chest for some time. One day he complained of pains in the chest and left arm. About 3 p.m. he went to the lavatory; at 3.15 groans were heard, and he was found huddled on the floor. He died about two hours later. The heart weighed 15 oz. There was a rupture of the posterior wall of the left ventricle, due to blocking of a branch of the left coronary artery, which was sclerosed.

A woman, aged 65, had complained for some time of not feeling well, and had rested on her bed a good deal. At 6 o'clock one morning she had a cup of tea, got up at 7, and went down twenty-four stairs. She was found collapsed on the ground floor landing. A tear $1\frac{1}{2}$ in. long was found in the anterior wall of the left ventricle, which was hypertrophied; the muscle was soft and the coronaries were sclerosed.

A man, aged 48, had attacks of indigestion at times. After a good breakfast one morning he went to lie down, and was found unconscious at midday. The heart weighed 18 oz. The coronaries were sclerosed, the aorta atheromatous, and there was a large infarct.

Twelve of these cases were in men and two in women; the average age of the men was 69 and of the women 69.5. Two of these patients died in bed, three died after definite exertion, while nine died after no apparent special effort.

As regards the site of the rupture, in eight cases there was rupture of the anterior wall of the left ventricle, in three cases the rupture was in the posterior wall of the left ventricle, while in two cases the right ventricle was ruptured. In every case the coronary arteries were calcified, while in four cases a definite obstruction existed; in one case *ante-mortem* clot was present.

It is particularly interesting to note that there was no history of previous heart disease in the men, except pains in the chest in five cases, two of which dated back only three and six days respectively.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF GUMMATOUS COLITIS.

THE attitude of the medical profession for many years towards syphilis of the large intestine was that the syphilitic was one of the commonest forms of stricture; but now opinion has swung round almost entirely to the opposite view.

Syphilitic strictures of the colon do occur, but they are exceedingly rare, and there are few authentic cases on record. It has been pointed out repeatedly that a localized chronic inflammatory lesion of the gut is not necessarily syphilitic because the patient had that disease—that is, because he showed a positive Wassermann reaction. The association, too, of cancer of the rectum and syphilis is by no means infrequent, and it is difficult, if not impossible in some cases, to differentiate between the two when they occur as isolated lesions. *Spirochaetes* indistinguishable from the *Treponema pallidum* are occasionally found in the stools in healthy (unsyphilitic) patients, but it is only when they are demonstrated microscopically in the walls of an inflamed gut that their identity with the organisms of syphilis can be clearly established.

In the case recorded here the patient gave an unequivocal history of syphilis; the Wassermann reaction was strongly positive, and a localized inflammatory lesion of the colon was found presenting all the microscopical characteristics (and they are few) of a diffuse gumma of the gut. *Spirochaetes*, however, were not demonstrated in the walls of the colon.

The patient, a woman aged 46, complained of abdominal pain, intractable diarrhoea, and loss of weight. The abdomen was slightly distended, and a hard fixed mass was felt on the left side at the level of the umbilicus. The liver and spleen were not enlarged, and there was no ascites. Rectal and sigmoidoscopic examinations were negative, but skiagrams after a barium enema showed an organic stricture of the descending colon. She had syphilis at the age of 28, and two miscarriages subsequently. When she was 34 she suffered from extensive ulceration of both legs and received her first course of treatment. A blood count showed secondary anaemia and lymphocytosis, and the Wassermann reaction was positive to the extent of four plus. A diagnosis of organic stricture (? carcinoma) of the descending colon was made, and the patient was admitted to hospital with view to operation. After admission she lost weight rapidly, and had from ten to twenty motions a day. They were liquid, very offensive, and contained large quantities of dark brown blood-stained clumps of gummy material.

As a short intensive course of antisyphilitic treatment produced no amelioration of the symptoms exploratory coeliotomy was performed. The abdomen was opened through a left paramedian incision, and the abdominal organs were then systematically examined. The stomach, liver, and spleen were normal. The stricture occupied the middle third of the descending colon, and in many ways resembled a colloid growth. It was $5\frac{1}{2}$ inches in length, and varied from three-quarters of an inch to 3 inches in thickness. It was firmly fixed to the posterior abdominal wall by a broad base. The surface of the tumour was of a dark grey colour and thrown into a series of irregular folds and bosses. The large intestine immediately above and below the strictured area presented a healthy appearance.

The whole of the descending colon was mobilized and delivered through the wound, a wide resection carried out, and axial anastomosis, with caecostomy, performed.

She recovered well from the operation, but one month later, on the date arranged for her discharge from hospital, she developed pneumonia and rapidly succumbed. Consent for a *post-mortem* examination could not be obtained.

Description of Part Excised.

Dr. A. K. Gordon cut sections of the 10 inches of gut removed, and reported that macroscopically the middle 5 inches was thickened and fibrotic.

The lumen could not admit the tip of the little finger. The interior was verrucose, and the mucous lining was absent; there was no obvious ulceration; and sessile papules 2 to 10 mm. in diameter were studded over the surface. Microscopically, in most of the exudate there were masses of plasma cells, and giant cells of irregular distribution were found. Secondary coccal infection and fibrosis were also present.

There was no evidence of sarcoma, carcinoma, diverticulitis, or tubercle, and Dr. Gordon was convinced that the condition was syphilitic.

London, W.1.

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