ULCER OF THE STOMACH, OPENING INTO THE LEFT VENTRICLE OF THE HEART.

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THE specimen which I exhibit is one illustrating a disease of very great rarity, no similar case having been recorded in the United Kingdom, and demonstrating features, in the clinical and pathological history of gastric ulcer, of unusual interest.

It is a specimen of an oval ulcer of the stomach ($1\frac{1}{2} + \frac{3}{4}$ inch), situated on the anterior wall, two and a half inches from the cardiac orifice, which perforated the gastric wall and the diaphragm, opened into the left ventricle of the heart, and caused death by hæmorrhage directly from the heart into the stomach.

The clinical history of the patient from whom the specimen was removed is as follows.

A farm-labourer, aged 19, was admitted, under my care, into Sir Patrick Dun's Hospital, at the end of October, 1885, suffering from articular rheumatism, of a subacute type, of a month's duration. He was well nourished, though somewhat pale; the knees were painful and swollen, and a pericardial friction-sound, limited to the sternum, was discovered. In a few days, the rheumatic symptoms disappeared, and the pericardial inflammation abated. The friction-sound was not followed by evidences of serous effusion, nor accompanied by endocardial valvulitis.

It was thought, therefore, that the pericardial inflammation had ended in resolution or adhesion. The febrile disturbance (99° to 101°) which existed at the time of admission diminished, but never disappeared, during the five weeks of the patient's life in hospital. He felt, however, so well, the first fortnight after admission, that, at his urgent request, he was allowed to sit up for a day or two; and his diet was sufficiently liberal, including eggs, bread and butter, and puddings—meat was not allowed, though asked for.

There were no symptoms pointing to disease of the stomach, with, perhaps, one exception. There was no pain in the epigastrium or back, either before or after food, nor any sickness of stomach; and there was a complete absence of any history of his ever having vomited or passed blood, or of ever having had any gastric distress. The only symptom which might have awakened a suspicion of what was going on in the stomach was a pain, which he referred to a small area, corresponding to the cartilage of the sixth rib on the left side, and also to the region near the coracoid process, under the clavicle, on the right side. This pain, he stated, he had suffered from during the last five years, at varying intervals; at times, it was so severe as to necessitate his giving up his work, and lying down. Strong pressure with the folded arms always relieved it. It was seemingly in no way connected with the introduction of food, and was not accompanied or followed by vomiting.

While he was under observation in hospital, he had three or four attacks of severe pain, such as I have described, and on two occasions they were relieved by morphine, but during the week preceding death he had much less pain than before, and seemed to be comfortable. The fever, however, was much higher, and assumed a hectic type, so that it was thought that probably some latent tuberculosis was its cause, and to this idea confirmation seemed to be lent by some imperfect respiration and slight crepitus audible near the root of the left lung. Albumen for the first time appeared in the urine during this pyrexial period.

During the night of December 8th, the patient had but little sleep; and in the morning of the 9th, about 8 A.M., he went to the night-chair, complained of feeling very weak, and fainted when he was put back to bed. The dejecta consisted of liquid blood. The patient became greatly blanched, and, in spite of immediate assistance, died in half an hour. There was no vomiting.

At the necropsy, there was marked anemia of the body generally, and of the viscera. There was a considerable amount of adipose tissue. The left pleural cavity contained some serous fluid, and the layers of the pleura over the diaphragm were adherent. The bronchial glands were enlarged, and one close to the bifurcation of the trachea was caseous and calcified. The pericardial sac was obliterated; the adhesions over the anterior surface of the heart were vascular, recent, and could be separated by the finger; but those over the posterior surface, and around the apex, were old and dense, and could not be

broken down. The valves and muscular structure of the heart were healthy, and nothing abnormal could be seen on examining the cavity of the left ventricle.

The stomach and intestines, down to the anus, were full of liquid blood, the former alone containing about two quarts. The anterior surface of the stomach was adherent to the diaphragm for an area of two inches; the adhesions were not of a dense nature, and were readily separable. On examining the inside of the stomach, when emptied of its contents, it was seen free from disease, except where it was adhered to the diaphragm; and here, situated on the anterior wall, two and a half inches from the cardiac orifice, and two from the lesser curvature there was an ulcer ($1\frac{1}{2}$ inches by $\frac{3}{4}$) which had perforated all the coats of the viscus, the tendinous portion of the diaphragm, and the obliterated pericardial sac. The floor of the ulcer was rough and granular, and was found to be the muscular structure of the under surface of the left ventricle of the heart not far from the apex.

No sac or abscess existed between the stomach and heart; the communication was direct, and the size of the exposed part of the heart was very little smaller than the gastric aspect of the ulcer. The cause of the fatal bleeding was not evident at first; but, on passing a probe, it was seen that a channel, of the size of a No. 5 catheter, existed in the ventricular wall, passing upwards and backwards, and opening into the left ventricle behind, hidden by a musculus papillaris attached to the posterior curtain of the mitral valve.

The muscular structure of the heart was perfectly healthy, and free from fatty degeneration, except at the seat of the ulcer; and here the fibres were granular, rough, and friable, with several interstices, through one of which the probe passed. Microscopically, the fibres were converted into granular matter, devoid of fatty globules, striation, or outline.

A careful review of the life-history and pathological conditions suggests the following as the probable order of events. (a) Simple ulcer of the stomach, of unknown duration with periods of quiescence and activity, situated where but little exposed to gastric digestion, or the irritation of ingesta. (b) Rheumatic pericarditis. Old adhesions of former attacks obliterated the posterior and under part of the sac, and recent adhesive inflammation attacked the anterior surface. (c) Activity of the gastric ulcer within a fortnight of patient's death; perforation of the gastric walls; adhesive peritonitis around it, preventing extension of the gastric contents into the peritoneal sac; perforation of the diaphragm, perforation of the pericardium, and exposure of the muscular structure of the heart to the action of the gastric juice; softening of the exposed muscles; and, finally, through the interstices, and especially through the larger canal, the cavity of the left ventricle was tapped.

The last act of this sad drama occurred during the night preceding death. If the course of events be as I have supposed, it is a curious coincidence that adhesive pericarditis should have preceded the perforation of the stomach. At first, I was disposed to attribute the pericarditis to the gastric ulcer, but the following considerations influenced me to alter my opinion in the direction indicated.

1. The adhesions over the posterior and under surface of the heart was evidently of old standing, as they were thick, dense, and fibrous, and the layers of the pericardium could not be separated.
2. The adhesions between the diaphragm and stomach were recent, soft, and readily broken down.

It is, moreover, more than probable that, had the gastric perforating ulcer penetrated the tendinous portion of the diaphragm, pneumo-pericarditis, and not adhesive pericarditis, would have been set up, and the left ventricle would not have been opened. Such an occurrence happened in a case published by P. Gutmann (*Berl. Klin. Wochenschr.*, April, 1880). As such cases are very rare, and, as in my case, there was no appreciable symptom to point to the presence of a round ulcer of the stomach, which, however, as Gutmann remarks, must have existed for a long time, I refer briefly to it.

A young man, aged 36, was under treatment for a right pleurisy for about a week, when suddenly a metallic sound, synchronous with the movements of the heart, was audible at a distance of some feet from the patient's bed, while great displacement of the lungs, cyanosis, and a pulse of 180, caused no doubt by pneumo-pericarditis having occurred. The patient died on the third day. The necropsy revealed a pericardium, dilated to a great extent with air, and containing a few ounces of non-putrid pus. On the posterior (? anterior) wall of the stomach, and the lesser curvature near the cardiac orifice, an oval opening existed, and, at the lowest part, a perforation led into the pericardium.

A. Mathieu (the reviewer in the *Archives Générales de Méd.*, 1880, vol. 2, p. 224) stated that he was aware of but two other similar cases

reported (those by Seninger and Rosenstein), but he unfortunately gave no references by which they can be traced.

Reference to a recent article, by Moizard, entitled "Observations on pneumo-pericarditis, consequent on gastric ulcer," has come under my notice. It is published in *Bull. et Mém. de la Soc. Méd. des Hôp. de Paris*, 1885, 3, s. ii, 180-183, but, to my regret, and presumably loss of valuable information, our Dublin libraries do not possess it.

Graves records a case of pneumatosis of the pericardium, in which the air, though derived from the stomach, was due to an abscess of the liver, which opened into both the stomach and the pericardium. (*Dub. Jour. of Med. Science*, Jan., 1869.)

The pericardium is liable to perforation from the œsophagus, by foreign bodies, as in Parkes' (*Path. Trans. Lond.*, vol. ii., p. 40) famous case of the juggler, who, while attempting, once too often, to swallow a sword, passed it into the pericardium, instead of the stomach, and set up a fatal pericarditis; and, as in the case of a set of artificial teeth being swallowed, and, lodging above the cardiac orifice of the stomach, ulcerated through into the pericardium. (*Medical Times*, May, 1858.)

I have, however, been able to find references to but two instances of where the pericardium was opened, and pneumo-pericarditis set up by an ulcer of the œsophagus. (Dr. Trotter, *Trans. Path. Soc. Lond.*, vol. iii., p. 316; and Dr. Forsyth Meigs, *Amer. Journ. Med. Sciences*, 1875.)

Dr. G. F. Duffey presented the Museum of the Royal College of Surgeons in Ireland with a rare specimen of ulcer of the stomach, perforating the diaphragm, and opening into the left lung, not far from the pericardial surface, and causing gangrenous abscess of the lung.

Perforation, therefore, of the pericardium from the stomach, would, I imagine, be followed rather by pneumo-pericarditis than by adhesive pericarditis.

Instances of ulcer of the stomach perforating the pericardium must be extremely rare, as there seems to be no recorded instance of it in the medical literature of the United Kingdom, and inasmuch as no more than a bare allusion to such a possibility is found in any of the standard works on the heart or stomach; for example, Ziemssen's *Cyclopædia of Medicine*; *The French Dictionary of Medicine*; or Pepper's or Fagge's recent works; or B. Bramwell's *Disease of the Heart*, etc. Brinton, *On Disease of the Stomach*, p. 175, writes, "the pericardium is very rarely opened;" but he gives no instance of such an occurrence—an omission excusable only on the grounds of his knowing of none. Dr. Habershon, whose attention, more than that of others, has been for many years directed specially to gastric disorders, informs me, in kind reply to my inquiry, that he has never met with such a case, nor is he aware of any recorded instance. Our pathological museums here contain no such specimens; and Mr. C. Stewart, the curator of the Museum of the Royal College of Surgeons of England, tells me of a similar absence there. Professor Turner courteously informs me that the only specimen in the Anatomical Museum of the University of Edinburgh, which at all bears upon the subject, is "one (No. 932), of a cancerous ulceration of the œsophagus and cardiac end of the stomach, and from the centre of the cancerous mass a small channel led into the pericardium, the entire serous layers of which were covered with recent lymph; no history is attached."

When I came across my case, I thought it was unique; but, thanks to my friend Dr. G. F. Duffey, I have discovered that three similar cases of perforation of the heart, from gastric ulcer, are recorded; each observer, like myself, thought his case the first reported.

Owing to the interest attaching to the subject, and the advisability of collating all such cases, I subjoin the following abstracted reports.

CASE I.—The first case is one presented by Professor Chiari¹ in May, 1880, to the Vienna Medical Society. The patient, a woman, aged 71, had died shortly after her admission to hospital, with the symptoms of gastric ulcer; namely, hæmatemesis and passage of blood from the intestines. At the necropsy a round hole, two centimètres in diameter, was found in the lesser curvature of the stomach. The opening led into a sac as large as a walnut, formed by cicatricial tissue; the sac extended through the diaphragm, pericardium, and wall of the left ventricle of the heart, and presented at its apex an ulcerated opening large enough to admit an ordinary probe into the left ventricle. The heart was closely adherent to the pericardium, over a space eight centimètres square; the muscular tissue of the heart was pale and friable, and had undergone moderate fatty degeneration; the endocardium was thickened for a distance of one centimètre around the perforation. The stomach and intestines contained a large quantity of fresh blood. The body generally was very anæmic. In the

walls of the sac, close to the opening into the stomach, a hard brittle mass, two millimètres long and about one millimètre thick, was found—probably a piece of glass that had been accidentally swallowed at some time. Dr. Chiari attributed no special importance to this foreign body, as he thought that it had merely found a lodgment in the sac, subsequent to the formation of the latter. He stated that he had been unable to find in medical literature any analogous case of the opening of a round ulcer of the stomach into the cavity of the heart.

The other two cases are reviewed in the *American Journal of Medical Science*, vol. lxxxiii, 1882, p. 560, and the authors were not aware of Chiari's case.

CASE II.—The first is published by Brenner,² and is that of a woman, aged 55, who was subject for years to attacks of cardiac pain, occasionally accompanied by vomiting. Six months before death, she had an attack of pleurisy with violent pains radiating to the epigastrium. A few days before death, she vomited blood, had severe cardiac distress, and passed black tarry stools. The necropsy revealed a circular perforation in the lesser curvature of the stomach, which communicated with an opening in the wall of the left ventricle.

CASE III.—The other (*Wiener Med. Blätter*, No. 52, 1881) is by Oser, where the necropsy of the patient, a woman aged 71, revealed a round ulcer of the stomach, which had opened into the left ventricle. The communication was established between the two organs by a long narrow canal. No air was found in the heart or in the arteries. The perforation had occurred three days before death, and was indicated by vomiting of bright blood, and by tarry stools.

My case may be considered as a supplement to these, and in some respects differing from them, for all the three cases to which I have referred occurred in aged females. My case was in a youth, aged 19. Vomiting and hæmatemesis were absent from my case, while invariably present, and a marked symptom, in the others. Brenner's case and mine resemble each other closely in their pathology, as in Oser's there was a long narrow canal through which the communication between the stomach and heart was maintained; and Chiari's, in like manner, had an intervening abscess or sac, and was due, in my opinion, to the irritation of the impacted glass.

It needs no great insight to recognise the reasons why such an occurrence as a communication being set up between the stomach and heart or pericardium must be one of the rarest pathological conditions met with.

Independently of the fact that, in 80 per cent. of all cases of gastric ulcer, it is situated on the posterior wall and near the pylorus, there are three important physiological and anatomical facts which go to explain this great rarity: (1) the very small part of the stomach which can possibly be in contiguity with that portion of the diaphragm upon which the heart rests; (2) the greater movement, during the processes of digestion and the acts of respiration, of the anterior surface of the stomach, so that, were an ulcer situated in this locality, adhesion between the stomach and diaphragm would be prevented; and (3)—and perhaps the most cogent—the intervention of the left lobe of the liver between the stomach and diaphragm.

This last point is one of no little interest, as it is one upon which there seems to be some diversity of opinion among the most distinguished anatomists—a diversity dependent, I believe, upon anatomical differences in the topography of the abdominal viscera presented by different bodies which have been the subjects of examination.

Quain (*Anatomy*, 7th edition, p. 867), writing of the relations of the stomach and liver, says: "when the stomach is quite empty, the left part of the under surface of the liver may overlap the cardiac end of that viscus;" and though he refers to the stomach, when inflated, being in contact with the diaphragm, it is plainly not with that part which lies near to or under the heart.

In the majority of subjects opened for dissection, which I have examined, the liver, by its left lobe, largely fills the left vault of the diaphragm, and entirely separates the tendinous portion from the stomach; and this is portrayed—and by all accounts true to life—in the beautiful models of the viscera in their relationship one to the other, prepared by His, a pupil of Braune.

Professor Cunningham, to whose kindness I am indebted for my information on this subject, and who enabled me to investigate it in the anatomical rooms of the School of Physic, Trinity College, Dublin, is in favour of the teaching of Braune, and sets forth, in his manual of *Dissections*, that the stomach does come into contact with the anterior portion of the left vault of the diaphragm just inside the left mammary line, and below the apex of the heart. Thanks to Professor Cunningham, I reproduce, in the adjoining topographical dia-

¹ Chiari H.: Fall von Perforation eines runden Magengeschwürs in den linken Herz-ventrikel, und Demonstration des bezüglichen Präparates. (*Anzeiger der k. k. Gesellschaft der Aerzte in Wien*, 1880, pp. 161-163. Abstracted from *Allg. Med. Cent. Ztit.* into the *New York Medical Record*, September 4th, 1880, p. 262.)

² Brenner, F.: Perforation eines runden Magengeschwürs in den linken Herz-ventrikel. (*Wiener Med. Wochenschrift*, 1881, No. xxxi.)

gram, the identical plate of Braune's taken from his frozen sections;

1. Esophagus. 2. Aorta. 4. Liver, right and left lobes. 5. Pericardial layer of diaphragm. 6. Stomach. [Section at the level of the fifth rib in front. Braune.]

and it will be seen that the only part of the diaphragm upon which the heart rests (5) which can come into contact with the stomach, is the small triangular portion marked off by dotted lines. This corresponds in its thoracic aspect to the under surface of the left ventricle, and on its abdominal to the anterior wall of the stomach, two inches and a half from the cardiac orifice, and two from the lesser curvature—points which strikingly correspond with the situation of the two pathological conditions which exist in the case I have recorded.

I had an opportunity of verifying this anatomical relation in one recent subject. A pin passed through the chest-wall, in the left fifth intercostal space inside the nipple, and directed downwards, traversed the pericardial aspect of the diaphragm, and impinged on the anterior wall of the stomach in the situation pointed out.

It would, therefore, appear as an anatomical condition to permit a perforation of the pericardium and heart from the stomach, that the left lobe of the liver should be smaller and narrower than it is known to be in the majority—or any way in a very large number—of instances.

CENTENARIANS: MISS HASTINGS, WHO DIED AGED 104.

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I THINK it worth while to send the particulars of the case of Miss Joanna Hastings, forasmuch as, irrespectively of her being the sister of the founder of our Association, they present many points of interest.

The particulars were furnished by Dr. Pike, of Malvern, her medical attendant, and were supplemented by myself on a visit to her, last September.

Her age is authenticated by the entry, which I saw, in the family Bible; that her father and mother were married at Chipping-Norton, February 21st, 1781, and that Joanna was born March 14th, 1782, and baptised at Sutton-Coldfield.

She had always been in comfortable circumstances, had led an active life, busying herself in works of benevolence and attendance upon the sick, and taking a good deal of out-of-door exercise, in walking and, in her youth, riding.

In September last, that is, when at the age of 103 years and 6 months, she was in good condition, rather fat, and tolerably strong, but not able to walk. She thought she could walk, but had been advised not to try to do so since her confinement to bed by bronchitis during the winter. She had a clear full voice, and, though deaf and obliged to resort to an ear-trumpet, she was remarkably happy, fond of conversation and hearing the news, taking an interest in the things of life, and in everything that passed; she amused herself with crochet, and had the newspaper read to her daily. She never talked, her niece told me, about dying, and on taking leave of her friends, never observed, "I shall not see you again," but usually said, "I hope when you visit Malvern again you will come and see me." This happy feature, I may observe, is not uncommon in very old people,

particularly those who retain their health, and are not much troubled by the weaknesses and annoyances attendant upon failing strength.

She was about 5 feet 6 inches in height, and her figure was rather bent. She required glasses only during the last six years, but her sight was failing, cataract having developed in one eye and commencing in the other. Six teeth remained, all in the lower jaw; namely, two incisors, two canines, and two bicusps. She had never used artificial teeth. Pulse 84 (it was under 70 when I counted it at 6.30 P.M.), regular, large and compressible. The radial artery was visible, but no unevenness or knottiness was discoverable in its coats. Respiration 24, and regular. Little arcus senilis. Micturition was natural. There was no apparent failure in any organ, and the sounds of the heart were natural. The chest-girth was 37 inches during inspiration, and 36½ in expiration; that is, and this is usual in old people, there was little movement of the thoracic wall in respiration. Elasticity of the costal cartilages could not be distinctly made out. I should say, that she was habitually, during the last eighteen months at least, a sufferer more or less from bronchitis; but, on the day on which I saw her, she appeared to be free from it; and she had none of the aching pains which sometimes trouble old people. Her feet often swelled a little, especially in warm weather, if they were hung down. She usually slept well for about eight hours, went to bed at 9.30, and awoke about 7. She enjoyed good appetite and good digestion, but was a moderate eater, taking three ounces of meat daily, with a cup of beef-tea and a table-spoonful and a half of brandy, and a cup of tea morning and evening, with the addition sometimes of corn-flour. The bowels acted usually on alternate days, with the assistance of a little aperient about twice in a week. Her intellectual powers are said to have been high, her memory good for recent as well as for long past events, and her disposition energetic, though of late years placid, "nothing appearing to ruffle her."

She had lived at Martley Rectory, in Worcestershire, at Worcester, and lately at Malvern. She was the first child of a family of fifteen. In earlier life, she was a spare person, but robust, with good health, good digestion, regular daily action of bowels, a good sleeper, rising at about seven, with good appetite, but a small eater, taking a glass of beer or cider for dinner, but no wine or spirit; meat at one meal, and tea, latterly coffee, for breakfast. She had acute and severe bronchitis at the end of 1877, again for two months in March, 1881; erysipelas of the head and pneumonia in September, 1881. She became subject to cough about sixty years ago, and had it for many winters. She dislocated her shoulder forty years ago, and injured her hip by a fall thirteen years ago, since which she had been lame. She told me that she had understood she was a remarkably small baby.

Her father died at the age of 100 years and 6 months; her mother at 84, of cancer or ulceration of the stomach; her brothers (1) aged 13, of water on the brain; (2) aged 39, in India (of fever?); (3) aged 87; (4) aged 64, of paralysis; (5) Sir Charles Hastings, the founder of the British Medical Association, aged 72, of cancer of the stomach; (6) aged 74; (7) aged 78, of heart-disease; her sisters (2 and 3) of brain-fever; (4 and 5) of consumption after measles; (6) of lung-disease after measles. It is probable, therefore, that these all died early, with suspicion of tubercular disease, which also arises in the case of the eldest brother; whereas she herself, the first-born of the family, out-lived all the others, and reached the age of 104.

Her father was aged 26 at her birth, and her mother 22. There was no blood-relationship between them. The members of the family are said to have been gifted above the average; but her father for many years suffered under mental depression, supposed to have been induced by many and various troubles.

In October, 1885, a month after my visit to her, I heard from her niece that the cataract in the "well eye" was advancing, and that, in connection apparently with her failing sight, another symptom appeared. "She sees 'sights,' as she calls them—wide plains, fields, trees, houses, children. The sights are almost always pleasant; only twice have they been at all disagreeable. Once, some weeks ago, she saw women at the window making faces at her; and last night she saw horrid-looking men. She talks about them, and wishes much to know the cause." I may mention, in relation to this symptom, that, not long ago, I was attending a gentleman, aged 78, who, in connection with severe photophobia, induced by overstraining his eyes, was terribly afflicted with these "sights," often of the most ugly and disagreeable nature. I am glad to say that he quite recovered, though the convalescence was slow.

Dr. Pike writes to me, that Miss Hastings died on March 12th, "from exhaustion, the cold weather, I think, considerably hastening her death. About six weeks previously, she got an attack, serious, of pneumonia of the bases of both lungs. This passed through its ordinary course, and she threw off the disease wonderfully, the lung clearing