

entirely ceased. After an interval of from 12 to 24 hours the cough reappeared, the difficulty in breathing gradually subsided, and the characteristic sputum gradually increased in quantity. Cyanosis was never marked but the distress was severe, with profuse perspiration and subsequent prostration. During the next day or two cough was frequent and the sputum was very copious but afterwards gradual improvement took place, though the bronchitic symptoms never really disappeared before another attack occurred.

The most striking characteristic of the sputum is the large number of Curschmann's spirals present. Shortly after an attack as many as a dozen are coughed up in the course of 24 hours, but they gradually diminish in number until shortly before the next attack only one or two are coughed up in the same interval. Associated with these spirals there are casts of the smaller bronchi. These I have never observed very complete in their branchings. The parent stem is usually of about the diameter of a crow quill and may or may not have small side branches but it always divides dichotomously and the resulting divisions again branch, but further than this I have rarely seen, and the casts in this case have never shown the finer ramifications of the bronchial tree seen in the very complete specimens that have been described. Nevertheless, there can be no doubt about the nature of the plugs in this case.

Examined in the fresh state the parent stem of the casts appears to be practically solid but the branches are hollow. This is also well shown by hardening in a mixture of equal parts of methylated spirit and glycerine and subsequently soaking in 50 per cent. glycerine which swells up the tissue, shrunken by the action of the spirit, to its former size. By this treatment the arrangement of the branches is well preserved and their tubular character is quite evident. A portion of the main stem hardened in alcohol, sectioned in paraffin, and stained, shows a structure of irregularly concentric layers probably of a fibrinous nature in which are embedded numerous nucleated cells. In the fresh state the smaller branches show a well-marked spiral arrangement indistinguishable practically from that of the true spirals. In the parent stem this spiral arrangement is absent. The spirals resemble those figured in von Jaksch's<sup>2</sup> "Clinical Diagnosis" and are all of the coarse variety without a central thread. The spiral markings both in the casts and in the true spirals seem to be due to the arrangement of the cells as much as to the spiral mucus (!) threads. The cells, which are very numerous and of varying size and character, are arranged in the form of a dense spiral band. Many of them show eosinophile granules.

There is one important point which has not, I believe, been previously described. I have noticed that some of the spirals show a division into two distinct branches at one end. There is no doubt of this. Spirals often interlace in a manner which suggests branching but is not really so. In true division the branches occur at the end of the spiral, are short (about one centimetre) and of equal length, and are not more than half the diameter of the main stem. Weak alkalis dissolve the greater part of the translucent envelope of the spirals as of the casts, leaving a much finer thread which retained the spiral arrangement quite unchanged. This is no doubt due to the fact that the spiral is so largely formed by organised cells which are unaffected by the weak alkali. Strong solutions of caustic potash dissolve both casts and spirals almost completely.

The present case appears to be, if one may use such a term, a "half-way house" between true asthma and plastic bronchitis. The character of the dyspnoea—forced inspiration followed by very prolonged and difficult expiration—is that of asthma. On the other hand, the long duration of each attack and the presence of true casts in the sputum point to fibrinous bronchitis. It is well known that occasionally spirals are found in the sputum of patients suffering from the last-named disease (Osler<sup>3</sup>), and also that fibrinous casts sometimes show spiral markings on their terminal branches. In my case the spirals are undoubtedly the more prominent feature of the sputum.

The following quotation from Hoffmann<sup>4</sup> is of interest in this connexion: "I am forced to assume that the terminal branches of the bronchial tree end in spirals. For when we consider that in the act of inspiration the lungs are distended and that the bronchi must follow this distension, can it be

imagined that a long straight tube should be distended longitudinally? It is much more probable that they resemble corkscrews and it is thus readily explained how the bronchi can follow the distension of the lungs. A very beautiful metallic cast of the bronchial tree which I saw at the Leipzig Pathological Institute shows this corkscrew-like course of the larger branches of the bronchi and suggests the assumption that the finest branches have a similar course. .... It is now understood how the fibrinous casts which originate in the fine bronchi occasionally show a spiral arrangement."

The most generally accepted theory of the formation of asthmatic spirals is that they are due to a twisting movement given to a mass of mucus in one of the bronchial branches. Yet it is difficult to understand how this spiral movement may arise. The present case leads me to suggest that these structures are in reality casts of the smaller bronchial branches similar in nature to the casts in true plastic bronchitis. In support of this theory I may draw attention to the following points: (1) fibrinous casts frequently show spiral terminations; (2) these terminal spirals are practically identical in structure with the true Curschmann spirals, also present in the sputum; (3) the spirals, at least in this case, owe their peculiar structure largely to the arrangement of the great number of cells present; and (4) some of the spirals terminate in two equal branches of smaller diameter than the parent stem. This fact alone makes it difficult or impossible to believe that these structures are formed by a spiral movement.

Hull.

## NOTES ON A CASE OF CHRONIC ULCER OF THE STOMACH; EXCISION OF ULCER; POSTERIOR GASTRO-ENTEROSTOMY; CHOLE-CYSTOTOMY.

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Now that the operation of gastro-enterostomy has become so common the publication of a single case of the kind may seem uncalled for, although the case, even from the operative point of view, is not without its noteworthy features, but I have thought it might be of sufficient interest to bear reporting if, reversing the usual order of precedence, an account were given of what was found at the time of operation and the lesions present were compared with the signs and symptoms noted previously and the history of the case up to that time.

The patient, a man, aged 54 years, a sufferer from long-continued dyspepsia, had lost weight to the extent of two stones within the last year and showed on examination evidence of pyloric obstruction. An operation was advised after consultation with Mr. A. W. Mayo Robson and Dr. A. G. Barrs and to this he consented. Accordingly, on Feb. 18th Mr. Mayo Robson operated, the patient having been on sterile food for two days beforehand and the mouth attended to with a view to oral asepsis. The stomach was found to be considerably dilated, the gall-bladder tense and full, and the tumour which had been imperfectly felt was a much enlarged and thickened pylorus. So hard and dense did this latter feel that it was impossible to say from sight or touch whether it consisted of new growth or not. In order to determine this Mr. Mayo Robson opened near the pylorus by an incision in the long axis of the stomach and exploring with the finger found it to be what it certainly did not look like from without, merely hypertrophy. A search was made further along the lesser curvature for the cause of this overgrowth and a very well marked and typical specimen of chronic ulcer was found on the posterior wall two and a half inches from the pylorus. The portion of stomach on which was the ulcer was clamped, the ulcer itself, of about the size of a sixpence with hardened edges and a bluish-grey floor, was excised, and the mucous membrane was brought together by a continuous suture of green catgut. The incision in the wall of the stomach was stitched up vertically in the usual way with a double row of sutures, mucous and serous. Although the evident cause of the trouble had been discovered and removed it was thought wise lest other ulcers were present to perform a

<sup>2</sup> Clinical Diagnosis, third edition, p. 115.

<sup>3</sup> Osler's Medicine, p. 634.

<sup>4</sup> Hoffmann: Nothnagel's System of Medicine, Diseases of Bronchi and Lungs, p. 234.

gastro-enterostomy. This proved, however, a matter of no little difficulty, for on attempting to reach the posterior wall of the stomach it was found that owing to an evidently long persisting perigastritis numerous adhesions had formed which prevented an easy exposure, the lesser peritoneal sac being obliterated and the transverse mesocolon firmly adherent to the stomach. A sufficient free surface of stomach for manipulative purposes was hard to find. A considerable amount of tension was consequently present after the junction of the jejunum and stomach was effected. There is little left of moment to relate; the patient made an excellent and uninterrupted recovery. It should, however, be added that the gall-bladder was emptied of its dark inspissated meconium-like bile, in which were innumerable tiny little gall-stones, and was drained in the ordinary way for two or three weeks.

I saw the patient the other day and he told me that his appetite and digestion were "simply marvellous"; he ate and drank anything not alone with impunity but with enjoyment. The patient had suffered for 20 or more years from dyspepsia, at first with intermissions of good digestion, but for the last two or three years almost constantly. Going back on his old symptoms—that is, prior to a year ago, so far as his memory could serve him—they come to this: heaviness, then epigastric pain, but not severe, shortly after a meal, continuing up to the next meal when relief came again for a time, belchings which sometimes gave him ease, regurgitations of sour mouthfuls and pyrosis, vomiting very rare, appetite good, and bowels constipated. These are evidently the symptoms of hyperchlorhydria and later chronic gastric catarrh.

The lesions which showed themselves at the operation were an ulcer near the pylorus, which does not preclude the possibility of others being present elsewhere, great hypertrophy of the pyloric sphincter, a much dilated stomach, posterior perigastric adhesions, and a gall-bladder showing signs of biliary catarrh, full of inspissated bile and tiny gall-stones or grit. What part the latter played in his symptoms it is impossible to say, but at any rate I could elicit no story of attacks of biliary colic. How far, then, did the lesions found correspond to the symptoms complained of by the patient and the signs presented on examination?

1. *Pain*.—It was seldom severe, it was never intense, nor was it of a burning or sharp cutting kind, but rather there was present a sense of constriction and intense discomfort and distension; it began half an hour after a meal and increased during the next two hours. It was felt first in the pit of the stomach and afterwards lower down but also across the chest and radiating to the shoulders. It was relieved completely by the next meal, so much so that for half an hour he thought he was going to escape in spite of all his past experience to the contrary. It was not made worse in the dorsal decubitus. These are not the symptoms one would expect from pyloric ulcer, but the posterior perigastric adhesions by hindering the motility of the organ may help to explain them.

2. *Hæmatemesis*.—He never vomited blood nor so far as he knew did he ever pass any by the bowel. This is against a diagnosis of ulcer.

3. *Vomiting*.—He very rarely vomited and only after attempting to take something heavier than usual. It was always a most painful process; the latter is not surprising in view of the adhesions, but in view of the dilatation one would have expected frequent vomiting.

4. *Belching*.—This was most troublesome and distressing too, in so far as it seldom brought much relief.

5. *Regurgitation*.—This was a constant sequel to every meal. It consisted of a greasy fluid with undigested bits of food.

These are quite in keeping with stagnation of food in a dilated stomach.

And now as regards signs.

1. *Tenderness*.—There was very little elicited anywhere, not at all over the pyloric end of the stomach. The only tender spot was over the greater curvature, its lower border, and to the right.

2. *Tumour*.—I think this was very doubtfully palpable at the pyloric end. Mr. Mayo Robson thought he could detect an enlargement there.

3. *Dilatation*.—This was thought likely from the obvious splashing three hours after a meal and was proved by distension with gas, the lower border extending from two and a half inches to three inches below the umbilicus.

4. *Peristalsis*.—This was very clearly seen as a well-marked wave along the whole length of the stomach and did

more to convince the observer of pyloric obstruction than any other sign or symptom.

5. *Loss of weight*.—This was the most alarming symptom of all. He had lost two stones in weight in the last year. It was really this that made him come to me and it was this that made me urge the advisability of immediate surgical interference. It more than suggested malignancy but yet, as events proved, the loss in weight was really the result of starvation. He had so reduced his rations in quantity and specially in nutritive value that he was literally starving himself, living as he did on beef-tea and gruel to escape pain, although not able to avoid discomfort. Obstinate constipation and a certain loss of strength and vigour may also be noticed. Lavage he bore badly, but a washing out of the stomach showed free hydrochloric acid.

To sum up, a diagnosis of ulcer of the stomach near the pylorus could evidently only have been made by deduction. The dilatation pointed to pyloric obstruction and the peristalsis made it fairly certain. As the obstruction was only partial and intermittent this was probably due to spasm. The most likely cause of this spasm was ulcer. So that, after all, one might have arrived at a correct diagnosis on general grounds, apart from such refinements as are implied in a chemical analysis after an Ewald's test breakfast of the contents of an Einhorn's stomach-bucket, although one would have to confess that many of the symptoms were of no help but rather a hindrance to such a conclusion.

Leeds.

## Clinical Notes:

### MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

#### A CASE OF PLEURO-PNEUMONIA ACCOMPANIED BY ABDOMINAL DISEASE.

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THE patient was a healthy, well-nourished girl, five years of age and was last at school on Feb. 2nd. Her mother had noticed that the child's face, legs, ankles, and body were becoming swollen and took her to a hospital on Feb. 5th, where she was examined, given a bottle of medicine, and told to come again in two weeks' time if she was no better. On the evening of the 9th local medical advice was sought as the "child seemed choking." She was then in bed and complained of pain over the lower half of the abdomen, which was tender on pressure; she called out frequently for the chamber utensil but passed nothing beyond a little flocculent stained mucus. There was considerable straining but no mæna. A lump was felt in the right iliac fossa. Her temperature was 98° F, her pulse was rapid, and her respirations were 50 per minute. The face was pale and the throat and the pharynx were normal. There were rales all over the front of the left chest and the resonance of both lungs was impaired posteriorly. A diagnosis of early intussusception was made and her removal to a hospital was advised. During the night the straining ceased and on the following morning the child's condition was lower. Her temperature was 98° and her pulse and respiration were respectively 180 and 80 per minute. At the hospital tubular breathing was noted at the left base and no intussusception was felt. The child died the same evening from pneumonia.

On the next day a post-mortem examination showed both lungs to be entirely solid and shrunken in appearance, and in many places, chiefly over the left apex, there was a layer of purulent lymph. On opening the abdomen no intussusception was apparent, but on removing and laying open the intestines the region of the ileo-cæcal valve was seen to be affected. For about one inch to one and a half inches on both sides of the valve there were recent crimson extravasations of blood in the submucous tissue, presenting flame-like patches half an inch in diameter. The lower inch of the ileum was oedematous and the crowded solitary glands were swollen and presented a sago-like appearance with a crimson background of extravasated blood. There were similar extravasations in the adjoining mesentery. The