

a tendency to form rouleaux; rapid appearance of crenation; pear-shaped, biscuit-shaped, globular forms; an excentric position of the depression on the surface of the globule, or the readiness with which the colouring matter accumulates in the corpuscle at one part, so as to give the corpuscle a nucleated appearance, are amongst the alterations observed after the blood is shed. They indicate a greater proneness to form-changes than in healthy blood, perhaps determined as much by altered quality of serum as by any integral change in the corpuscles themselves. At the same time the predominance of small forms and what appear to be broken fragments of corpuscular matter point either to an accumulation in the blood of imperfectly formed elements allied to M. Hayem's hæmoblasts, or, on the other hand, to evidences of the disintegration of the corpuscles.

Since neither the spleen nor lymphatic tissues show any evidence of change, the discovery of the blood-forming function of the bone-marrow by Neumann has naturally led to its examination in cases of pernicious anæmia, but with results both positive and negative. Dr. William Pepper of Philadelphia, in 1875, was the first to offer this explanation of this obscure disease, and described definite changes, chiefly of small granular cells in the marrow of the radius and sternum in one case. Cohnheim in the following year also described a condition of hyperplasia of the bone-marrow, fat being almost entirely absent, and the marrow of a red colour. Besides ordinary marrow and lymphoid cells he found a large mass of small red corpuscles, a few fully formed ones, and an abundance of nucleated red corpuscles of various sizes, some of which were found in the blood itself. The next most important contribution is that by a member of this College—Dr. Osler, of Montreal—who in two cases, one in conjunction with Dr. Gardner and the other with Dr. Bell, made a very thorough examination not only of the blood but of many of the bones of the skeleton. The marrow was of a violet-red colour and almost destitute of fat, containing besides the ordinary elements a large number of nucleated red corpuscles, similar to those described by Neumann as transitional forms between lymphoid cells and red corpuscles. Dr. Osler,³ in examining the marrow of the long bones in fourteen cases of chronic disease, found evidences of a similar hyperplasia in only one case. Others have confirmed these observations; and others, again, have not been able to show any such changes in the marrow, whilst Eisenlohr,⁴ finding that the alterations in the blood and marrow, similar to those described, were met with in a case of cancer of the stomach as well as in one of pernicious anæmia, is inclined to regard these conditions as dependent on the cachectic state rather than the cause of it, and a similar opinion has been expressed by others.

The question, however, cannot yet be entirely disposed of, and there is no *prima facie* reason against a myelogenic anæmia sometimes occurring. If it do occur, then it points to defect in the normal evolution of the corpuscles, and we have the strange concurrence of appropriation of material by a blood-forming organ and development of the corpuscles up to a certain point, but no further. Meanwhile research is also being prosecuted in the other directions—viz., increased destruction of blood elements, Quincke finding large quantities of iron deposited in the liver, kidneys, and pancreas, in one or two cases of this disease; but his observations, as well as the solitary observation of Dr. Finny as to excess of iron in the urine, require further confirmation before being finally accepted. Further, I may remark that, in two cases of Quincke's, the total quantity of blood was estimated by a simple process of calculation of the corpuscular richness before and after transfusion, and it was found in these cases to have fallen to 5 per cent. and 4·34 per cent. of the body weight, the normal being 8 per cent.

In conclusion, one cannot fail to be struck by the broad resemblance in the midst of difference that exists between the course of a fatal idiopathic anæmia and leukaemia and Hodgkin's disease (or pseudo-leukaemia, as it is called)—a resemblance due to the factor common to all of them: the diminution of the oxygen-carriers of the blood. In leukaemia there may be both an increased production of white corpuscles and an incomplete conversion of them into the red. In Hodgkin's disease, or pseudo-leukaemia, there may or may not be any leucocytosis, but there is certainly deficient formation of red corpuscles; and in idiopathic

anæmia there must be either such deficient formation or an excessive consumption of these same elements, so that there is no sharp line of demarcation between the two. Similarly in chlorosis we have a disease, the characteristic of which appears to be an imperfect evolution of the blood, and except in a few instances it does not seem possible to distinguish chlorosis from idiopathic anæmia. I must not, however, be contented with this mere assertion, and propose, therefore, to speak of chlorosis in its relation to idiopathic anæmia at the commencement of my next lecture, when I hope also to enter more fully into the effects of the anæmic state.

ON GASTROSTOMY.

WITH TWO SUCCESSFUL CASES, ONE FOR CICATRICAL AND THE OTHER FOR CANCEROUS STRICTURE.¹

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THE case to which I draw attention is one upon which I performed the operation of gastrostomy on August 3rd, 1880, for cicatricial stricture of the œsophagus. The patient was a girl, aged twenty-two, named Lydia C—, admitted into Guy's Hospital under my care on July 15th, 1880. It seemed from her history that she had been healthy and steady up to January, when from some domestic trouble she, with suicidal intentions, took half a wineglassful of sulphuric acid. Medical advice was at once obtained, and an emetic was said to have been given, and after the lapse of a certain number of weeks the soreness of her mouth and pharynx disappeared. Difficulty of deglutition, however, was soon experienced, and steadily became worse, so that for some weeks before admission she had lived entirely on liquids, and these were swallowed with great difficulty. Indeed, it took her almost an hour to swallow half a pint of milk.

When the patient came under my observation she was pale, emaciated, and feeble, and although I made many attempts to pass a bougie or catheter down the œsophagus I never succeeded, the instrument invariably being stopped at the upper orifice of the œsophagus, behind the cricoid cartilage. Under these circumstances I determined to open the stomach, and operated on August 3rd. The operation was performed with the patient under the influence of the anæsthetic mixture and under the carbolic spray. It was commenced by an incision three inches long, running obliquely below the margins of the left ribs, and the skin and muscles were consecutively divided down to the peritoneum; all bleeding vessels were twisted, and capillary oozing arrested by a hot sponge. The peritoneum was then divided, and the left lobe of the liver, which became visible, was pressed upwards. The stomach was then readily found, and brought well forward to the surface of the wound. Great care was observed to keep the parts well sponged, to guard against anything passing into the peritoneal cavity. Two loops of fine carbolised silk were then introduced through the peritoneal covering of the stomach, about a third of an inch apart, and with these and a pair of tenaculum-pointed forceps the stomach was kept *in situ*. The ends of the loops were left long. The stomach was next carefully fastened by a series of interrupted sutures to the margins of the skin around. The sutures merely included on the one hand the peritoneal covering of the stomach, and on the other neither included the parietal peritoneum nor the divided muscles, but the skin alone. The stomach at this stage of the operation was not opened. During the next five days the patient was fed by nutrient enemata every three or four hours, and enough morphia was administered subcutaneously to give rest. The wound was covered with lint saturated with terebene and oil. No sickness, elevation of temperature, pain, or other trouble followed the operation, and on the sixth day the stomach was opened. The opening made was very small, not more than the eighth of an inch long. It was made by elevating the stomach by means of the two loops which had been introduced through the peritoneal covering of the stomach at

³ Gardner and Osler, Case of Progressive Pernicious Anæmia. Montreal, 1877.

⁴ Deutsche Arch. f. Klin. Med., xx., 1880.

¹ Read at the Harveian Society, March 17th, 1881.

the first stage of the operation where the ends had been left long, and cutting with a narrow tenotomy knife from loop to loop. The loops were then removed. The patient did not feel this part of the operation.

An india-rubber tube, with its end cut obliquely, was then introduced into the stomach through the small orifice, which it dilated, and some milk was poured into the stomach through a funnel. After this the patient was fed regularly through the artificial gastric orifice, and the case went on in all ways well. The girl in three months had gained 19 lb., or about a pound and a half a week. For some weeks after the operation she was fed upon minced meat and pancreas made into a pulp, and this thick food was readily passed into the stomach by means of a simple apparatus, which may be described as a small valveless Higginson's syringe, with one tube fitted with a funnel for the introduction of the food, and the other cut obliquely to facilitate its introduction into the stomach through the artificial orifice, the patient with her finger and thumb so nipping alternately the respective ends of the tube when the syringe is compressed as to prevent regurgitation.

I should say that this apparatus, which was made by my dresser, Mr. Studer, enables a patient to be fed on thick instead of liquid food. The patient has been able to take fluids by the mouth since the operation, and to swallow small crumbs of bread or sponge-cake, but I have not yet been able to pass any tube into or through the stricture. It is to be noticed that there has not been under any circumstances the smallest escape of the stomach's contents through the artificial opening, and this is demonstrated by the healthy aspect of the orifice and of the parts around. This happy result is doubtless due to the smallness of the orifice which I made, and the elasticity of the walls of the stomach; the artificial opening yielding readily to the introduction of the obliquely cut end of the tube, and closing on its removal by its own elasticity.

The advantages of this condition are obvious: the patient is saved the annoyance necessarily appertaining to the escape of the stomach's contents, as well as the local distress and irritation which the escape of gastric juice always causes. She is, moreover, able to take her meals standing or sitting with little trouble and without inconvenience; indeed, with all truth, it may be said that the patient is now, eight months after the operation, in the enjoyment of excellent health, and with the exception of the loss of some, though not all, of the pleasures of the table, there is nothing in her condition either to shorten life or to render it less valuable.

Remarks.—The operation of gastrostomy is applicable to two chief classes of cases—to those of stricture or obstruction of the œsophagus from cancer, and to those of cicatricial stricture. In the former class the operation is not curative, but palliative; it is undertaken mainly with the view of prolonging life, and secondarily as a means of diminishing the agonies of a death from starvation. In the latter class it is undertaken with the view of saving life. In the former class consequently the results of past experience are neither over-brilliant nor encouraging, since out of thirty cases tabulated by M. Verneuil up to 1879 twenty-two sank within the first week, and two alone survived the operation a month. One, however, was then living five months after the operation. It is to be remembered, however, that up to the present time the operation has almost always been postponed too long—that is, it has been only entertained when the patient was literally at death's door, and undertaken with the view of palliating the tortures of a death from starvation, and under these circumstances it is not to be expected that grand successes should be recorded.

Were the operation undertaken earlier better results would be obtained; and I have the records of an unpublished case of my own before me, which shall be appended to this paper, in which the patient survived the operation more than eight weeks; and my colleague, Mr. Howse, tells me that four cases upon which he has operated lived from five weeks to seven months. If, however, the operation were undertaken, as I hold it should be, as soon as the diagnosis of the case is made, and as soon as the obstruction is marked enough to prevent the deglutition of solid food, better results would be obtained; for by such a practice the patient would be in a better condition to undergo the ordeal, the stomach would be less atrophied, and consequently a better organ to deal with; the miseries of hunger would be guarded against, for they would be anticipated; and above all, the progress of the cancerous disease in the œsophagus

would be rendered less rapid, and its disintegrating changes would be postponed, in the same way as surgeons now know by the operation of colotomy cancerous stricture of the rectum is relieved, and the changes in the cancerous growth are retarded if not prevented.

In the second class of cases where the operation had been undertaken for cicatricial stricture better results are to be told, for Verneuil's case lived seventeen months and died of some unknown disease. Trendlenberg's case was living three years after the operation. My colleague, Mr. Howse, had a case two years ago which still lives, and the present case promises to demonstrate still better the value of the operation, for the patient is not troubled, as all the others have been, by the escape of the contents of the stomach from the artificial orifice and the consequent local soreness and irritation which such an escape entails. And this leads me to make a few remarks on the operation itself. The incision I made, and believe to be the best, is an oblique one about three inches long and half an inch below the borders of the left ribs. The tissues should be divided carefully down to the peritoneum, and everything like bleeding should be stopped before the peritoneum is opened. The stomach as soon as caught should be brought well forward into the wound and held with a pair of tenaculum-pointed forceps; two loops of carbolised silk should then be introduced, about half an inch apart, through the peritoneal covering of the stomach and its subserous tissue, to indicate the spot at which, on some future day, the artificial opening is to be made. The stomach is then to be carefully stitched to both edges of the skin wound by a number of fine stitches passed through its serous covering alone, in the same way as Nélaton suggested in the operation of enterotomy for abdominal obstruction. There does not seem to be any necessity to include in these stomach sutures the divided parietal layer of peritoneum, the edges of which naturally fall against the wall of the stomach, which is well brought forward. The patient is then to be left alone, and fed by nutrient enemata, to allow the stomach rest and time to unite with the abdominal wound, and after the lapse of from three to five or six days, according to the necessities of the case, the stomach should be opened. In this case I completed the operation of opening the stomach on the sixth day. The full credit of this suggestion is due to my colleague, Mr. Howse, and I have adopted the practice in two cases after witnessing its benefit in several instances. I believe this method of operating has great advantages and tends to make the operation safer. The opening into the stomach should be very small; in the present instance it was no larger than the width of a tenotomy knife, and yet experience has proved that such an opening is elastic enough to allow of the easy introduction of a tube equal to three-eighths of an inch in diameter, and to prevent the regurgitation of even a drop of liquid from the stomach. The stomach having been opened the patient was fed at once, for the first few days with milk, eggs, and beef-tea, but later with beef and pancreas minced and cooked by a simmering process till the whole was almost liquefied. At first a tube and funnel were used, but later on the thick food was more readily introduced by a simple apparatus [shown and described]. The girl can now take liquids by the mouth, and a little solid. Still no tube can be passed or opening formed into which any probe can be passed. Under such circumstances there is but little prospect of her doing without artificial feeding.

By way of conclusion let me urge upon my medical friends to suggest a resort to gastrostomy in cancerous obstruction of the œsophagus so soon as the diagnosis is made, and there is practical difficulty in the deglutition of solid food, for by an early operation many more lives would be prolonged, and much misery saved. The progress of the disease, moreover, would be greatly retarded. Whilst in cicatricial stricture the operation should be resorted to only when all hope of the stricture being dilated has vanished, and there is no other alternative.

Cancer of Œsophagus; gastrostomy; death two months after operation from extension of the disease to the trachea, lungs, liver, and mediastinal glands.

(Reported by Mr. HIND.)

J. B.—, aged sixty-one, a labourer, was admitted into Stephen ward on Feb. 25th, 1880, under Dr. Wilks' care. Patient has enjoyed good health; never drank much. Has had gonorrhœa, but not syphilis. Ten months before patient first noticed difficulty in swallowing solid food. It appeared

to stick in the œsophagus on about a line with the upper end of the sternum. He subsequently was unable to swallow his food, and vomited it immediately. His appetite has remained good. He has not suffered much pain. On admission he has apparently lost much flesh; his skin is hot and dry. He has a circumscribed fluctuating tumour situated over the inner half of left clavicle, not infiltrating the skin; it is not painful, and the patient had never noticed it. A few small glands are enlarged at the lower part of the posterior triangle of the neck. About a fortnight ago an abscess formed on the dorsum of the left foot, which is very red and inflamed. Tongue moist, furred, and white. Teeth not good, only two left in the upper jaw. Bowels open.

Feb. 26th.—House-physician passed a bougie down the œsophagus, but it did not pass lower than on a level with the upper part of the sternum. To take one ounce of brandy three times a day, with eggs.—March 2nd: The tumour is 3" long by 1½" deep; feels elastic and soft, and at anterior end is soft and fluctuating. Deficient entry of air all over the chest; chest expands tolerably; no dullness; no signs of invasion of thorax by growth; breathing hoarse all over chest. The house-physician passed a large, then a small bougie, both to about 4½" below epiglottis, corresponding to a point immediately above the sternum.—6th: Fluctuation of swelling; opened by Mr. Bryant, and four ounces of pus came away.—10th: One ounce of brandy to two ounces of milk as an enema.—11th: Mr. Bryant performed first part of operation of gastrostomy, as described in the last case. The wound healed kindly without any peritoneal or other complications.—16th: Operation completed; opening into the stomach a small one.—17th: Temperature normal; fed every two hours with four ounces of milk and an egg, and half an ounce of brandy occasionally.—18th: Injection every four hours; temperature normal; bowels open; tongue fairly clean.—19th: Abscess on foot opened.—22nd: Temperature normal; fed six times a day, two of which consist of milk and eggs, the remainder of meat; about four or five ounces of brandy; weighed 98 lb.—23rd: Leg put on back splint.—25th: Up in a chair in ward.—27th: Fed four times a day.—April 21st: Weighed 103 lb.—May 5th: Cough troublesome; weaker.—10th: Died.

Necropsy by Dr. HILTON FAGGE.—Body much emaciated. A slight sore on one instep, and in the abdominal wall was a fistula to the left of the umbilicus from the operation of gastrostomy. The opening was in the centre of a small amount of scar tissue. It was the size of a No. 10 catheter, and above—that is, the upper margin had upon it an overhanging lip, which looked more like mucous membrane than skin or scar. The cranial bones were normal; no thickening. Dura mater and sinuses, arachnoid and pia mater, were normal. Arteries of head very atheromatous at base. The brain weighed 50 oz. In the head of the outer nucleus of lenticular ganglion upon the right side there was a small-sized cyst of an old apoplexy; its colour was brownish, and its lining membrane smooth, and in its walls were some small vessels. The smaller vessels in the interior of the brain did not look so very thick.—Spine: The spinal vertebræ had various nodosities upon their anterior margins at the line of junction with the intervertebral substances in the lumbar and dorsal regions.—Respiratory organs: Recent lymph over hinder part of left pleura. Both had in various parts, particularly over the hinder part of the lower lobe and in the outer part of the upper lobe, a considerable infection of the lymphatics with cancer. They stood out on the surface as interlacing lines of milk white or yellow colour, forming a rectangular latticework. There were, in addition, in some parts, flat plates of growth spreading in the pleura from these. The lungs felt very solid towards the root. On section they were seamed in various parts by thin lines of cancerously infiltrated septa. These had a head in appearance in various parts, and in the centre of the lung this condition was surrounded by a granular pneumonic lung, which it was difficult to say was not pneumonia. It may have been pneumonia mixed with growth. The heart weighed eight ounces and a half, and was quite healthy. The œsophagus was tightly strictured opposite the second ring of the trachea. There was very little thickening of its coats, but on slitting up the tube there was a jagged white growth in the mucous membrane, without any well-defined margin, and, in addition, a superficial ulcer in the mucous membrane, which ran up vertically in the covering of the thyroid and cricoid cartilage to the left side for more than an inch. The floor of this ulcer presented no cancerous attributes, but the edge

of the ulcer was distinctly raised and everted with a soft fleshy growth. The trachea was not perforated, but its wall was extensively implicated. On looking at the mucous surface of the trachea the whole of it, down to the bifurcation, looked mottled and thick, and granular-looking tubercles of growth studding it all down, and from these parts the disease had invaded the external parts. The thyroid body was extensively infiltrated with a similar growth. The glands were affected, but they were not much enlarged. The actual stricture of the œsophagus was not more than half an inch in length. Above and below the parts were normal.—The liver contained three or four small circular, firm, cancerous nodules; in other respects the liver was healthy.—The intestine was in a very interesting condition. Throughout the whole length of the small intestines, but chiefly in the lower part, were ulcers which had rather thick edges, which tended to run round the bowel, and which exposed clearly in the floor the muscular fibres of the bowel. One of these had gone deeper, and by a second ulceration in the already ulcerated surface had all but perforated by a transverse slit, two-thirds of an inch long. The ulcers externally had a puckered aspect, but there was no material narrowing of the bowel, and one at least had very minute white grain-like bodies (? tubercles) in the subperitoneal tissue. I think it was an early tubercular affection of the lymphatics in the floor of a chronic ulcer. Near the cæcal valve the ulcers became more irregular and more superficial—not like any particular ulcer—and similar small superficial circular and oval ulcers ran down in the large intestine for some distance. But there was one additional peculiarity in the large bowel. The mucous membrane was smoother than usual, and sanded over with multitudes of small rough-looking grains, distinctly projecting from the surface. I hesitated to pronounce an opinion on its nature. They were too prominent, and abruptly so, for solitary glands. No lardaceous disease of liver or intestine.—Spleen: The capsule was thick. The suprarenal capsules were healthy.—The kidneys weighed eight and a half ounces. One kidney was very good. The other contained many cysts of small size, but its cortical structure was good.—Most of the joints showed osteoarthritic changes. The toes were nodular at their edges. The knees had a large part of their surface from centre outwards devoid of cartilage, and eburnated; while at the margin of the cartilage there came a nodose edge of bone. The elbows were in a similar state. The synovial membrane in knees could hardly be said to be vascular. The shoulders were also affected, the left bicipital groove being markedly prominent from new matter under the muscular attachment of outer lip.—With regard to the ulceration of the intestine, I was in doubt as to its nature. The ulcer in some parts certainly involved part of Peyer's patches, and further they were well-defined, clean-looking ulcers, exposing the muscular coat without any granulations—in this resembling typhoid ulcers which had sloughed out, and not tubercular ulcers. On the other hand, the peritoneal aspect was in no other places in favour of tubercle. The stomach at the seat of operation was firmly united to the skin. No signs of peritonitis were present.

A CASE OF CYSTICERCUS CELLULOSÆ IN THE VENTRICLES OF THE BRAIN; SUDDEN DEATH.

By FREDERIC FLINT, M.D.

A BOY in his seventeenth year, a pupil in a large boarding-school at Scarborough, apparently in good health, played on Thursday, Feb. 24th, at a well-contested game of football. On Friday at 10 A.M. he was no more. He took an active part in the game on Thursday, and thoroughly enjoyed it; in the evening he complained of headache, and went to bed early; he vomited once or twice during the night, but did not disturb another boy who slept in a separate bed in the same room. On Friday morning he did not appear at the breakfast-table, and the head-master of the school went immediately to see him. He then complained of his head aching severely, and of having vomited, and the terrible scene, which came to so speedy an end, began. The poor boy made several heart-rending, piercing