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THE WISDOM OF SURGICAL INTERFERENCE IN HÆMATEMESIS AND MELÆNA FROM GASTRIC AND DUODENAL ULCER.

Being a Paper read in the Section of Surgery at the Annual Meeting of the British Medical Association, held at Portsmouth, August, 1899.

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HÆMATEMESIS, although a common symptom in gastric ulcer, is rarely sufficiently large in quantity to cause anxiety, yet the mortality from hæmorrhage in this condition of the stomach is not inconsiderable. Leube estimates the mortality to be about 5 per cent., and Welch at from 3 per cent. to 5 per cent. The question of the propriety of surgical interference in certain cases has received considerable attention of late, from surgeons as well as physicians, and the general tone of the medical press at the present time is very conservative indeed. It may be said that while there is, perhaps, a fairly general consensus of opinion that the surgeon should be consulted in cases of frequently repeated small hæmorrhages, which, in spite of rest, abstinence from stomach feeding, and medical therapy, continue to occur and threaten the patient's life: yet it is as a last resource, and that in the presence of large copious hæmorrhage, surgery is of little or no avail. There seems to be two very good reasons for this opinion in the fact that the large majority of cases recover under medical and dietetic treatment, and that surgery up to the present has not been particularly successful. Mikulicz has operated four times, and three of the four patients died, and adds that he only knows of two successful cases, the one of his own and one of Roux. Hartman[1] has collected 12 cases of operation, only four being successful; and would be inclined to trust to rest, strict diet, and the application of ligatures to the four extremities, with the addition of intravenous injection of normal saline solution.

On the other hand, Dieulafoy strongly urges immediate operation in every case of hæmatemesis in which the loss of blood equals or exceeds half a litre, especially if it recurs within twenty-four hours, and reports a case of hæmorrhage from a superficial ulcerated patch, in which he gathered up into a fold the ulcerated mucous membrane and ligated it, with

recovery. Keen, in his Cartwright lectures, takes the conservative view of Mikulicz and Hartman and would abstain from operative measures except in cases of repeated small hæmorrhages which will almost surely finally destroy life. Leube says surgical interference is absolutely indicated by repeated small hæmorrhages, especially if accompanied by dilatation of the stomach, and relatively indicated by a large hæmorrhage, yet never by one single vomiting of even a large quantity of blood.

My attention was particularly directed to this subject by the following case, successfully operated upon and which I will report very briefly :

On July 21st, 1898, I was asked by Dr. George Wilkins (Montreal) to see with him a lady, 35 years of age, who had had repeated copious hæmorrhages from the stomach for seven days. Previous to this her health had been good and she had not had any of the symptoms of gastric ulcer. Her present illness began just one week prior to my first visit. Her family history was negative. I found her blanched, mucous membranes and finger-nails white, and the slightest exertion was followed by dyspnœa. She had been treated by absolute rest in bed, rectal feeding, only small bits of cracked ice being given by the mouth, also hypodermic injections of morphine and ergotin, large doses of bismuth and acetate of lead, without any apparent lessening of the quantity of blood vomited, nor did temperature in emulsion succeed any better. Her temperature was 100° F., and her pulse rapid, very compressible and sbabby. On the following day we decided that operative treatment alone gave any chance of recovery, and had her removed to the Montreal General Hospital. Her temperature on admission to the hospital was 102⅘° F., pulse 136, respirations 44. As soon as possible I exposed the stomach, through an incision in the median line, drew the stomach well forward, and after carefully packing around to protect the peritoneal cavity, opened through the anterior wall. After washing out some blood clots a careful search was made for the bleeding point. No deep excavated ulcer was found, but blood was seen oozing from three different places, which looked like linear fissures in two instances, and in the third like a stellate fissure. Around the fissures, over an area of about 1 cm., there was apparent a superficial loss of surface epithelium. From the stellate fissure blood seemed to come from three small vessels. The flow of blood was completely arrested by the application of the Paquelin cautery, and the stomach and abdominal incisions closed without drainage. The subsequent course of the case was one of uninterrupted convalescence. The nausea disappeared, no vomiting occurred after the ether or subsequently. I began stomach feeding the following day, and from that time on she took nourishment by the mouth, although rectal feeding was continued for four or five days. While I was operating an assistant gave an intravenous injection of forty ounces of normal saline solution. The woman is now quite well, not anæmic, has perfect digestion and assimilation, and is living an active life.

I have permission to report the following very instructive case :

On February 6th, 1899, I was asked by my colleague, Dr. Elder of Montreal, to see with him a lady aged 42. This lady, on returning home that afternoon after doing a little shopping, and without having had any previous symptoms referable to the stomach, vomited a large quantity of blood—I can safely say 10 ounces—and notwithstanding complete abstinence from food by the stomach, absolute rest in bed, ice over the epigastrium, and the administration of such drugs as morphine and ergotin hypodermically, acetate of lead and turpentine, the vomiting of blood in considerable quantities continued to occur at intervals during the following day and night. Early on the morning of the third day, or about forty hours after the first hæmatemesis, she was removed to the Montreal General Hospital. As she felt somewhat better after getting to the hospital she was allowed to rest. No vomiting occurred until a little after three o'clock in the afternoon, when she brought up about 12 ounces of blood. At 5 P.M. she was placed upon the table, ether administered, and Dr. Elder brought forward the stomach through a median incision. After carefully packing round about, the anterior wall of the stomach was opened, and a large, deeply-excavated ulcer about 1 inch long by 1½ inch wide was at once seen. It was situated on the lesser curvature 5 cm. below the œsophagus. In the centre of the base was an open artery, from which the blood poured freely. The vessel was secured by a catgut liga-

ture carried through the base of the ulcer, just beneath the opening in the wall of the vessel on a curved needle. This arrested the hæmorrhage completely. A row of additional sutures was carried across the floor of the ulcer in such a manner that the floor of the ulcer was somewhat elevated and the edges approximated. After closing the opening in the anterior wall of the stomach the abdomen was closed without drainage. Unfortunately this patient died from acute anæmia the following day at 1 A.M. Among other things 1½ litre of normal saline solution was administered subcutaneously, and an equal quantity *per rectum*. At the necropsy it was found that no bleeding had occurred after the operation.

The following evening when I sat down quietly for that period of retrospection and introspection that, I fancy, is not foreign to the experience of any surgeon, I came to two conclusions: First, that this woman's life would in all probability have been saved if she had been operated upon after the second hæmorrhage; and, secondly, that the tone, the advice, given to-day in the medical and surgical literature was responsible for the delay. I felt that had I another similar case early operation would save it. But, as Carlyle says, "It is easy to be wise behindhand."

With a view to getting further information on this question of the operability of these cases, I asked Dr. Wyatt Johnson, Pathologist to the Montreal General Hospital, to give me extracts from the reports of all necropsies performed on patients who had died from gastric hæmorrhage. From Dr. Johnston's report I find that in a series of 2,000 necropsies, 15 or 0.75 per cent. died from hæmorrhage from the stomach. Of these 15 cases, in 5, or 33⅓ per cent., the hæmorrhage was from a gastric ulcer; in 4, or 26⅔ per cent., from an ulcer in the duodenum; in 1 from rupture of an œsophageal varix, secondary to thrombosis of the portal vein, atrophy and sarcoma of the liver; in 1 to rupture of an œsophageal varix secondary to cirrhosis of the liver; in 2 to leucocythæmia; and in 2 to aneurysms rupturing into the lower end of the œsophagus.

Now I will in as few words as possible state just the condition found in each of these cases of gastric and duodenal ulcer:

CASE I.—Female, aged 40. Fatty and cirrhotic liver, atrophic spleen, no ascites, fibroid kidneys. About the middle of the lesser curvature an ulcer, almost circular, three-quarters of an inch in diameter, with sharply cut edges which are not raised. In the centre of the floor is an open artery, not plugged, and readily admitting a small probe.

CASE II.—Male, aged 50. Chronic ulcer of the stomach, perforation, and hæmorrhage. In the peritoneal cavity is half a gallon of thick dark-red fluid. Three inches from the pylorus is a large perforation in the anterior wall of the stomach, occurring in the base of an ulcer 6 cm. long by 2 cm. wide. A branch of the gastric artery ulcerated through having an orifice into which a small probe can be passed.

CASE III.—Female, aged 20. Lower two-thirds of the œsophagus dilated, and on cutting it open a number of irregular elongated losses of substance are seen; the strands of tissue between these look cicatricial. About the middle of the posterior wall of the stomach is a yellowish slough 6 mm. by 10 mm. in size, and extending 3 mm. to 4 mm. deep, reaching into the muscular coat. No plugged vessels detected.

CASE IV.—In the fourth case there was found an oval loss of substance on the lesser curvature, three inches from the pylorus; size, 3 cm. by 2 cm. Edges round and clean cut, base made up of dense fibroid tissue. In this the ends of obliterated as well as open vessels are seen—the latter very numerous, four of these presenting gaping orifices. On injecting water into the gastric artery it flows in a free stream from the largest of these orifices.

CASE V.—The necropsy report of Dr. Elder's case, already sufficiently reported.

CASE VI.—The report of a duodenal ulcer, unfortunately mislaid.

CASE VII.—Duodenal ulcer, oval in shape, situated immediately outside the pyloric ring, 1 in. long in the axis of the gut and ¾ in. wide; deep, with rounded edges, which are much undermined. Immediately in the

centre of the floor is a small dark elevation, blood-stained, and consisting chiefly of fibrin. On injecting water through the hepatic artery, small clots are washed out from this, and the water flows freely from the floor of the ulcer.

CASE VIII.—Male, aged 72. Immediately below the pyloric ring is an irregular ulcer extending through the greater part of the gut.

CASE IX.—Stout middle-aged woman. In the stomach, which is of large size, is found about 30 ounces of blood mixed with remnants of food. Mucosa dark and blood-stained, otherwise unaltered. Immediately outside the well-marked pyloric ring is a large ring, 3.5 cm. by 1.5 cm. in size, partly blocked with clot, which, when removed, allows the insertion of two fingers as far as the second joint into an oblong cavity, the size of a small orange, beneath the liver and gall bladder. The edges of the orifice are smooth and rounded. A probe passed into the right branch of the hepatic artery enters the cavity, and on slitting it open the wall of the artery is seen to be ulcerated across. The loss of substance on the vessel wall is about 2 mm. by 3 mm. The wall of the sac is partly formed by the wall of the gall bladder, which is sloughing in places.

Dr. Wyatt Johnston adds that, "The pathology of gastric and duodenal hæmorrhage as illustrated by *post-mortem* examinations shows the following conditions to be the commonest:

"1. Bleeding from an eroded surface, or from an eroded vessel in the base or wall of an ulcer.

"2. Bleeding from passive congestion, as in cirrhosis of the liver or other forms of portal obstruction, or in heart disease. In most of these cases the serious hæmorrhages come from œsophageal varices.

"3. Abnormal states of the blood, as in leukæmia (usually associated with portal obstruction), also rarely in hæmophilia, etc.

"Besides this, from reflex causes, such as vicarious menstruation, the blood may come, not from the stomach or intestine, but from some adjacent organ, as in aneurysm. Traumatic causes are rare.

"It must be remembered that an addition to hæmorrhagic conditions, properly speaking, we frequently find minute ecchymoses and hæmorrhagic erosion of the mucosa whose pathological significance is doubtful and which have no well-recognised clinical correlation. These often represent merely terminal or even agonal changes. The dilated venules of the stomach mucosa are distinguishable from ecchymoses on careful examination, but the difficulty of interpreting the finer *post-mortem* changes in the stomach mucosa is increased by the rapidity with which softening and autodigestion occur in it. It is often impossible to recognise blood in the gastro-intestinal canal by ordinary microscopic or spectroscopic tests, though the hæmatoporphyrin spectra are unusually obtainable. Concentrated carbolic acid makes a good solvent for blood so altered. Preliminary hardening for twenty-hours in Mueller's fluid has been recommended as a means of recognising *post-mortem* the otherwise invisible points of hæmorrhage in newborn children. It is difficult for a pathologist to see why the operative treatment of eroded varices at the œsophageal ring should offer any insuperable difficulties. Gastric ulcers differ from ordinary ulcers by the small amount of granulation on the surface and of superficial inflammatory exudation at the margins, so that the degree of vascularity is relatively small."

We learn from the *post-mortem* reports, in addition to the fact that in some instances serious complications resulted from what may fairly be termed an unduly prolonged period of progressive disease, that the hæmorrhage was in every instance arterial, that there was loss of substance by ulcera-

tion in an artery of sufficient size to cause death from hæmorrhage. This observation is quite in accord with the statement made by Orth in the fifth edition of his *Pathologisch-anatomische Diagnostik*, pp. 500, namely, "that with reference to the origin of gastric hæmorrhage we must remember that the blood supply comes from the deeper layers, and that the arteries, while still in the deeper parts of the mucosa, break up into capillaries, so that on the surface of the mucosa the only vessels are venous capillaries and small venules."

Clinically, we divide cases of hæmatemesis into two distinct classes, those in which occur frequently repeated small hæmorrhages, and those in which the loss of blood is in larger quantities, and it would seem that each class has a distinct pathological lesion, and this should be borne in mind in the consideration of the treatment of hæmatemesis, medically or surgically; and, however efficient hypodermics of morphine and ergotin may be in small hæmorrhages coming from the capillaries and small venules of the surface of the mucosa, it may not, I trust, be considered rank heresy to question their therapeutic value in the presence of a considerable lesion in the wall of a considerable artery. It is also to be noted that the bleeding point in the case which I have reported was in every instance accessible, situated in a part of the stomach wall that could be readily come at, or, if duodenal, in every instance it was put outside the pyloric ring.

If, then, we can exclude aneurysm, which should generally be possible, and leukæmia, which should be possible with the aid of the microscope, and cirrhosis or other cause of portal obstruction, I hold that the surgeon's duty is to interfere in suitable cases; and if you will permit me I will offer as a definition of suitable cases those first of frequently repeated small hæmorrhages, which persist in spite of medical and dietetic treatment, and which threaten to destroy the life of the patient; and, secondly, in all cases of a large hæmorrhage which, in spite of medical and dietetic treatment, recurs. In these cases I advocate operation after the second hæmorrhage.

For hæmorrhage occurring in cirrhosis, and portal obstruction, I do not think that the surgeon can accomplish any good. In these cases the hæmorrhage is generally from a varicose œsophageal vein, a part difficult of access, and secondary to a pathological lesion but little amenable to any form of treatment.

In the case of gastric and duodenal ulcer, however, the conditions are totally different. The lesion is primary and local, and in addition to the securing of the bleeding point, a more smooth and rapid convalescence is secured, the likelihood of perforation removed, and if found advisable the performance of a gastro-enterostomy or pyloroplasty secures to the stomach that rest which so favours the healing of the ulcer and ensures against the subsequent occurrence of narrowing and obstruction at the pylorus.

REFERENCE.

[1] *Sem. Méd.*, 1898, pp. 7, 8.