The bleeding gastric ulcer — will it bleed again, and if so, why?

A case for repeat endoscopy in evaluating stigmata

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Summary

Nine patients qualified for surgery for a bleeding gastric ulcer — all had a 'visible vessel'. Three of these vessels were thrombosed including 2 in patients who had been in shock. The smallest patent vessel was 0.35 mm in diameter, and 6 of the bleeding vessels were subserosal. The features thought to predispose to further bleeding were vessel size, a lateral hole in the main trunk of the vessel and, possibly, previous recanalization or ingestion of a drug which affected haemostasis. Five of 6 patent arteries had a cap of thrombus over the breach forming a false aneurysm. It is suggested that clinically these should pulsate, enlarge, leak — with persistent fresh thrombus in the ulcer crater on repeat endoscopy — and finally rupture. Where the underlying vessel is thrombosed the stigmata of a non-pulsatile 'visible vessel' or thrombus in the ulcer should disappear on repeat endoscopy. The sizes of the arteries in the normal antrum are tabulated.

The use of early gastroscopy in the evaluation of patients with upper gastro-intestinal bleeding has identified the patient with a visible vessel in the base of the ulcer as having at least a 50% chance of bleeding again. The decision to operate on a poor-risk patient before the next haemorrhage requires a more accurate prediction of recurrent bleeding. This pilot study was aimed at identifying the nature of the vessel in the bleeding gastric ulcer, possible factors affecting the natural history of the eroded vessel and the features which could profitably be studied clinically to improve the prediction of further bleeding.

Histopathological findings

The resected parts of the stomachs containing the ulcers were examined macroscopically and microscopically. A 'visible vessel' was seen macroscopically within the ulcer in all 9 patients (Fig. 1). One patient had a second ulcer without a visible vessel.

Patients, methods and results

The clinical details of 9 consecutive patients operated on for a bleeding gastric ulcer were noted. The median age was 58 years and after resuscitation the median blood pressure was 130/80 mmHg. All the patients had required more than 5 units of blood, and 5 had been in shock during the haemorrhage. Of the 9 patients, 2 had continued to bleed in hospital, 2 had had previously documented gastric ulcers (1 with a previous haematemesis and melaena) and 5 had developed melaena more than 1 week before admission to hospital for haematemesis. Seven of the 9 patients had been operated on shortly after admission, but in 2 patients there had been a delay of more than 7 days before surgery. Salicylates had been taken by 2 patients for the antiplatelet effect, by 1 for influenza, 2 for headache and 1 for stomach ache. Two denied salicylate intake, and in 1 the relevant question was not asked.

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To gauge the size of the arteries in the normal antrum, sections were taken from the 9 macroscopically normal lesser curves and in each anatomical layer the internal diameters of the 3 'smallest' and 3 'largest' arteries were noted, giving 27 vessels in each of the 6 categories (Table 1). Although small arteries are present in all layers, the larger arteries are in the muscle and subserosa. Three of the 'visible vessels' were in the submucosa and 6 were subserosal. The ulcers were excised from the antrum, embedded and serially sectioned for microscopic analysis.

<table>
<thead>
<tr>
<th>TABLE I. DIAMETER OF VESSELS IN THE NORMAL ANTRUM</th>
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<tr>
<td>Submucosa</td>
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<tr>
<td>(mm)</td>
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<tr>
<td>Smallest</td>
</tr>
<tr>
<td>Median</td>
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<tr>
<td>Mean</td>
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<td>Largest</td>
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Fig. 2 and Table II detail the findings in the 9 'visible vessels'. There was no myxomatous change in the vessel at the breach. Where there was a lateral or 'side hole' with unequal limb diameters it seemed as if the breach occurred where the channel branched. Two of the patent limbs were recanalized, suggesting previous thrombosis. The 7 eroded vessels not visible to the naked eye were all end-on to the ulcer, with advanced organizing thrombus in the lumen (Fig. 3).

<table>
<thead>
<tr>
<th>TABLE II. DIAMETERS OF THE 9 'VISIBLE VESSELS'</th>
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<tr>
<td>(mm — INTERNAL ELASTIC LAMINA)</td>
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<tr>
<td>Lateral erosion:</td>
</tr>
<tr>
<td>Equal limbs*</td>
</tr>
<tr>
<td>0.402</td>
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<tr>
<td>0.402</td>
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<td>0.560</td>
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*Accepting difficulties of fixation and serial section.
†These limbs thrombosed.

On histological examination the 16 eroded vessels seen had evidence of endarteritis in the vicinity of the ulcer, but there was no atherosclerosis or other specific vascular lesion.

Discussion

The 9 specimens came from the patients who had qualified for surgery on clinical grounds. They all had a macroscopically 'visible vessel', but histological study suggests that 3 of the 9 patients would not have bled again.

There are small arteries in all layers of the stomach wall, with the larger vessels in the muscularis and subserosa. Barclay and Bentley showed further that the submucosal vessels can contract to reduce blood flow. As the smallest patent bleeding vessel had a diameter of 0.35 mm, it is not surprising that most of these were subserosal arteries. That some bleeding is fast enough to produce shock may indicate that a large vessel is involved. In this study, 5 patients had been in shock, and 2 of them bled from end-holes in arteries which then thrombosed and were no longer patent at the time of surgery.

Ten of the 16 eroded vessels seen microscopically were thrombosed (Fig. 3). Factors identified here which may affect the natural history of the eroded vessel require study in a larger series. Vessel size and lateral erosion in the main trunk of the vessel appear to predispose to further bleeding. Erosion of a previously recanalized vessel may be important. Atherosclerosis was of no importance. The role of drugs which affect haemostasis has not been adequately defined, but may well tip the balance when there is bleeding from a vessel which would otherwise thrombose.

When the vessel exposed in the base of the ulcer (the 'visible vessel') was looked at the breach in the vessel was seen to be flush with the base or side wall of the ulcer, and in 6 there was an elevated cap of thrombus over the breach. In 5 of these the underlying lumen was patent, forming a false aneurysm which should pulsate, enlarge, leak and rupture (Fig. 2). Where the underlying vessel is thrombosed, the vessel should not pulsate and with time should become flush with the ulcer and then disappear, as do other stigmata. But even the 3 patients with thrombosed 'visible vessels' had had a history of melaena for at least a week before admission for haematemesis. This may mean that they initially had a false aneurysm which then thrombosed, or possibly a vessel which bled, thrombosed and, because of deeper ulceration, eroded to the next patent channel.

Looking for features which could profitably be used to improve the prediction of repeated bleeding, we suspect that a false aneurysm (a pulsating 'visible vessel' or evidence of a leak, i.e. fresh clot in the ulcer) persisting on repeated endoscopy will
favour further bleeding. Features against further bleeding would be a flat or elevated non-pulsatile 'visible vessel' or an ulcer in which the adherent fresh clot disappears on repeat endoscopy. This prospective evaluation of stigmata should prove more valuable than relating stigmata to time of onset of the bleeding.

Conclusion

This study has identified many aspects of pathology and epidemiology which may affect the natural history of the eroded vessel, requiring study in a larger series. It suggests why all 'visible vessels' are not equal and that persistent features of a false aneurysm on repeat endoscopy may herald further bleeding in the near future.

REFERENCES


IgG-coated latex particles and the identification of sperm antibodies

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Summary

The identification of sperm surface antibodies forms an integral part of the investigation of male infertility. We tested 39 randomly selected men for the presence of sperm surface antibodies by using IgG-coated latex particles during mixed antiglobulin reaction (MAR) testing. The latex MAR test results were compared with the red blood cell MAR and the Friberg sperm agglutination test results. The latex MAR is a sensitive indicator and can be employed by physicians to identify the presence of sperm antibodies on the sperm surfaces.

The understanding that a man might have an infertility problem because of auto-immunity against his own spermatozoa became clear in 1954 with the pioneering work of Rümke who discovered sperm antibody activity in 2 infertile males. The test method that he applied to their serum was the well-known Kibrick technique. Although serum sperm antibody activity is important, immu-