Case report

Initial failure of angiography to demonstrate a bleeding pancreatic cancer: a case for provocative agents

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Background

Mesenteric angiography is commonly employed in the modern-day investigation of gastro-intestinal bleeding if the bleeding sites cannot be identified by endoscopic means. Angiography is optimally sensitive in the presence of active bleeding. However, vasospasm may occasionally account for a negative study shortly after bleeding.

Case outline

A 70-year-old lady with inoperable carcinoma of the pancreas presented with gastro-intestinal bleeding. Although upper endoscopy visualised active bleeding from the tumour, which had invaded into the duodenum, haemostasis could not be achieved endoscopically. Therefore, mesenteric angiography was arranged.

Results

The initial angiography failed to demonstrate the bleeding site, which only became obvious on a repeat study, when embolisation was performed to achieve haemostasis.

Discussion

Vasospasm probably accounted for the initial negative study, as the second angiography was able to demonstrate contrast extravasation without the use of any anticoagulant or thrombolytic agent. It is not our routine to give pharmacological agents to provoke bleeding after a negative angiography, but for selected patients this manoeuvre may turn out to be more cost-effective.

Keywords

angiography, vasospasm, provocative agents, bleeding pancreatic tumour.

Introduction

Mesenteric angiography is an important tool in the modern-day management of gastro-intestinal bleeding because of its diagnostic as well as its therapeutic properties [1–5]. Therapeutic angiography is best suited to frail patients who are poor surgical candidates. It is well known that intermittent bleeding often leads to negative angiographic study. The minimal bleeding rate required for angiographic detection is 0.5 ml/min [6–8]). When the bleeding rate reaches 1 ml/min, angiography becomes optimally sensitive [9]. Apart from the bleeding pattern, technical faults and vasospasm may account for a negative study [10]. Therefore, some studies have examined the safety and efficacy of provocative angiography [11,12], which is believed to enhance the sensitivity of the technique in the investigation of gastro-intestinal bleeding.

Case report

A 70-year-old lady with a long-standing history of hypertension and non-insulin-dependent diabetes presented with a 1-month history of painless progressive jaundice. She also noted substantial weight loss (14.5 kg) over the last 2 months. Her serum bilirubin level on admission was 218 μmol/L (normal <15), alkaline phosphatase 295 IU/L (normal 45–145) and alanine transaminase was 318 IU/L (normal <58). Ultrasound scan of the abdomen revealed a large hypoechoic mass (5×4 cm) in the pancreatic head, together with dilatation of the common bile duct (12 mm) and pancreatic duct (3 mm). Endoscopic retrograde pancreatocholangiography (ERCP) was attempted, but failed due to tumour extension into the first and second part of the duodenum causing partial obstruction. Therefore, percutaneous transhepatic biliary drainage was established to

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relieve the obstructive jaundice. Meanwhile, CT scan demonstrated vascular encasement at the junction of the portal and splenic veins. In view of her existing medical problems, the bulky tumour and the vascular involvement, surgical intervention was not considered.

The patient then developed gastro-intestinal bleeding with haemodynamic instability requiring 4 units of blood transfusion over 12 h. Urgent upper endoscopy confirmed active bleeding from the tumour, but haemostasis could not be achieved by endoscopic means. Emergency angiography was therefore arranged immediately with the intention of embolisation. No extravasation of contrast was demonstrable on the first angiogram (Figure 1), although a small splenic artery aneurysm was detected incidentally. She developed fresh haematemesis again 3 h after the first angiography, associated with hypotension and tachycardia. A second emergency angiography was performed, which showed a vascular lesion supplied by the gastroduodenal artery with active extravasation of contrast into the second part of duodenum (Figure 2). The identified bleeder was embolised with lipiodol-histoacryl, and no more extravasation of contrast was noted thereafter (Figure 3). A total of 10 units of blood was transfused for this bleeding episode. The patient remained stable after the embolisation and was discharged home 9 days later.

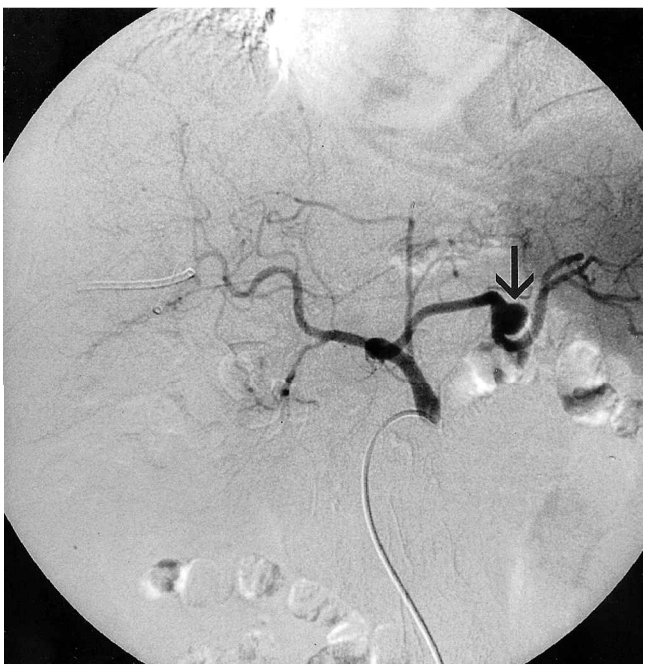

Figure 1. *The first angiographic examination of the coeliac trunk demonstrates no contrast extravasation, but incidentally notes a small splenic artery aneurysm (black arrow).*

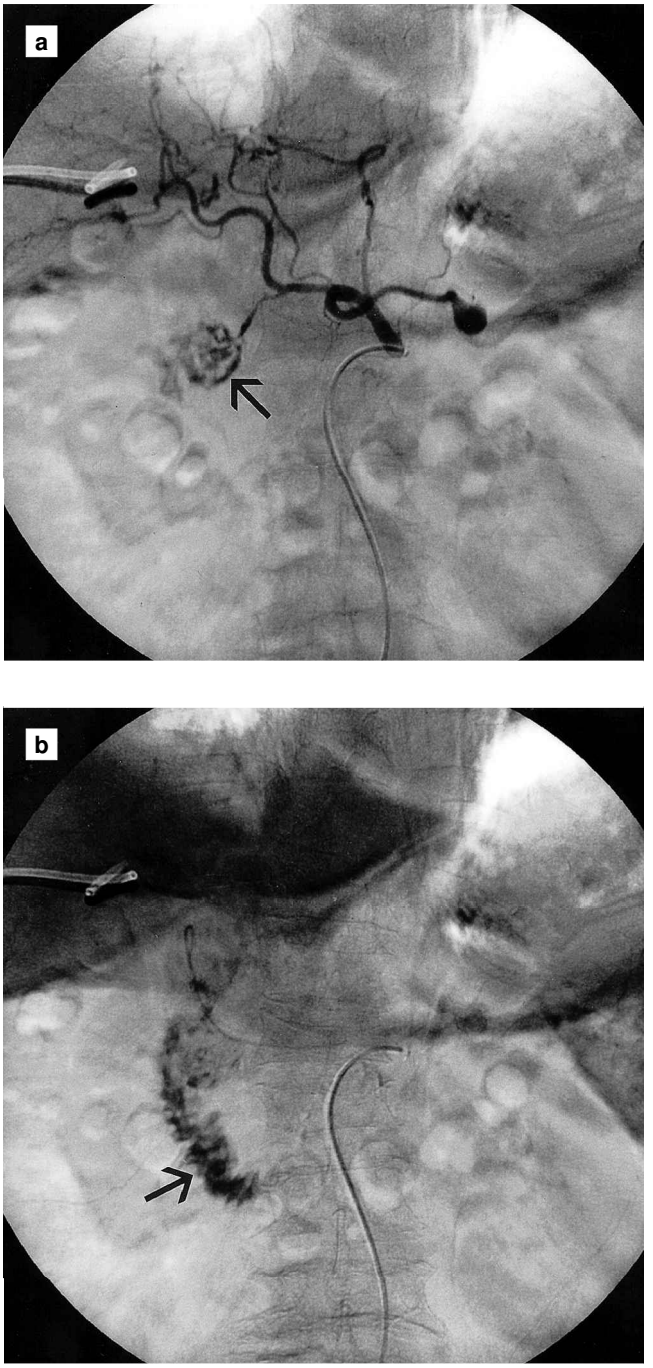

Figure 2. *The second angiographic examination of the coeliac trunk demonstrates (a) a vascular lesion (black arrow) supplied by the gastroduodenal artery and (b) active contrast extravasation into the duodenum (black arrow).*

Discussion

Therapeutic angiography was the best treatment option for this particular patient in view of her advanced pancreatic malignancy. Although the bleeding was visualised during endoscopy and the bleeding was sufficient to cause haemodynamic instability, the initial angiography was negative,

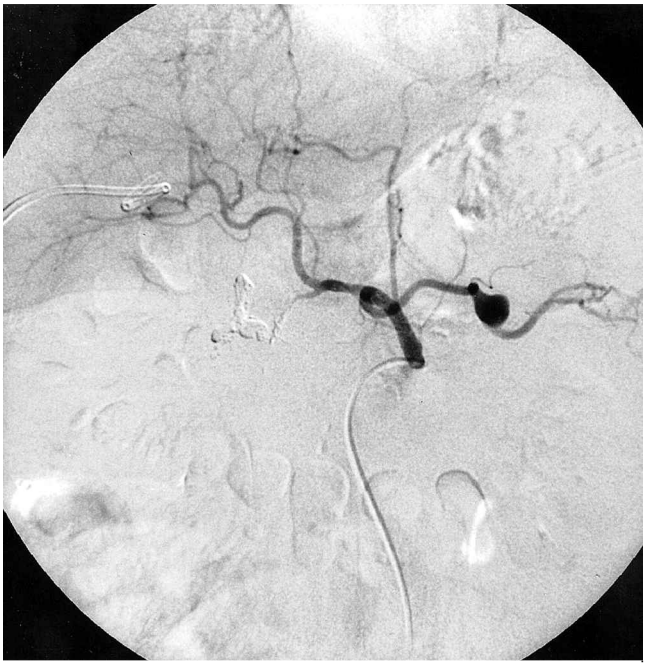

Figure 3. *Post-embolisation angiogram shows no more contrast extravasation.*

which made embolisation impossible. Repeat angiography was clearly indicated because of the continuous profuse haemorrhage [10]. Vasospasm rather than clot formation probably accounted for the initial negative study, as the second examination was able to demonstrate contrast extravasation without the use of any anticoagulant or thrombolytic agent. Furthermore, the vascular lesion was not demonstrable on the initial angiograms, suggesting the probability of spasm of the feeding (gastroduodenal) artery. Tumour infiltration leading to narrowing of the gastroduodenal artery might provide an alternative explanation for the initial negative angiography.

In neurosurgical practice, transient vasospasm has been well described after ruptured arteriovenous malformation [13], but vasospasm is not considered as a prominent feature in gastro-intestinal bleeding. It is not our routine practice to give pharmacological agents to provoke bleeding after a negative angiography, but for selected patients this technique may turn out to be more cost-effective than repeated angiographic studies. In retrospect, we might have avoided the disturbance in arranging a second emergency angiographic study, reduced the transfusion requirement and minimised the haemodynamic instability if a vasodilator had been given during the initial angiography.

Theoretically, vasodilators are more likely to induce haemorrhage early after the bleeding episode; clots will form later and will become more organised with time. Thus the choice of pharmacological agent for provocative angiography depends very much on the timing of the study. In general, three types of pharmacological agent have been used for provocation of bleeding: vasodilators, anticoagulants and thrombolytics, either alone or in different combinations. A vasodilator is useful when reflex vasoconstriction occurs soon after bleeding. Anticoagulant or even thrombolytic agents may have to be used when clots are formed. Although the reported experience with provocative angiography is limited, available studies [11,12] suggest that this investigation can be performed safely despite the theoretical concern of uncontrollable gastro-intestinal haemorrhage.

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