**Case report**

Treatment of haemobilia by selective arterial embolisation

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**SUMMARY** We report a patient in whom haemobilia occurred after percutaneous liver biopsy. Selective hepatic arteriography showed a fistula between hepatic artery and portal venous system, with appearance of contrast in the biliary tract. Intrahepatic bleeding was stopped by arterial embolisation with a mixture of gelatine foam and sterile dura mater. Cholecystectomy was subsequently required as a haemocholecyst developed. The technique of arteriography and embolisation allows accurate localisation of intrahepatic bleeding sites and may avoid the need for a direct surgical approach to this problem.

In a prospective study, 7% of patients undergoing percutaneous liver biopsy developed scintigraphic evidence of intrahepatic haematomas. Significant haemobilia, haemorrhage into the biliary tree, is however, extremely rare after this procedure. Between 1967 and 1977, 13 patients with haemobilia were reported in the literature. Three of those patients died. A variety of management approaches have been used, ranging from aggressive surgery to conservative management. We report a patient treated by arterial embolisation during hepatic angiography and advocate this approach.

**Case report**

A 45 year old Pakistani woman was admitted with a six day history of jaundice, pain in the right upper quadrant, fever, dysuria, and rash. She had taken dihydrocodeine, sulindac, and cotrimoxazole.

She was a thin, icteric woman without stigmata of chronic liver disease. Abdominal examination revealed tender hepatomegaly and the spleen was just palpable.

The haemoglobin was 12.6 g/dl and leucocyte count, platelets and coagulation screen were normal. Serum bilirubin was 200 µM/l (n<14). Aspartate amino transferase 246 IU/l (n<40) and alkaline phosphatase 595 IU/l (n<133). Hepatic ultrasound and scintiscan were normal.

In view of persisting fevers to 40°C and a rising serum alkaline phosphatase, a percutaneous liver biopsy was performed 14 days after admission, via the lateral approach, using a Tru-cut needle (Travenol—New Jersey). The histological appearance of the biopsy was that of a drug-induced hepatitis.

Forty-eight hours later the patient experienced three episodes of colicky, right upper quadrant pain. Two days later fresh melaena was detected on rectal examination and the haemoglobin had fallen to 9.4 g/dl. Endoscopy showed altered blood in the stomach with fresh blood issuing from the ampulla of Vater. Over the ensuing 48 hours melaena continued and six units of blood were transfused.

Six days after biopsy, angiography was performed to locate the bleeding site and attempt its embolisation. Selective hepatic arteriography was performed via the femoral route, using a steerable catheter (Muller, US Catheter International Inc., New Jersey). Radiographs early in the arterial phase demonstrated an arteriovenous fistula (Fig. 1), with early filling of the portal venous tree. Late films showed contrast within the common bile duct (Fig. 2). Selective embolisation of the branch of the right hepatic artery supplying the abnormal segment was performed using sterile, absorbable, gelatine sponge (Sterispon, Allen and Hanbury, London) with sterile human dura mater (Lydura, Davis and Geck, Cynamid, Gosport, Hants).

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patient remains well with normal haemoglobin and liver function tests.

Discussion

In this particular patient, haemobilia after percutaneous liver biopsy was not a diagnostic problem; she presented the classical symptom complex of biliary colic, jaundice, and gastrointestinal haemorrhage, and endoscopy confirmed the diagnosis by showing fresh blood emerging from the ampulla of Vater. The management of this complication, however, remains difficult. In three of the 13 patients reported in the literature, bleeding ceased spontaneously after a period of conservative management with transfusion alone but one fatality has followed this approach. Bleeding may also recur after a period of some weeks. Experience with haemobilia after blunt trauma to the abdomen has encouraged a policy of early surgical intervention and some patients have therefore been treated with major procedures including hemi-hepatectomy and hepatic artery ligation; these procedures have a significant mortality of their own, particularly in

Angiography at the end of this procedure confirmed obliteration of the vascular supply to the abnormal segment, while the remainder of the liver was unaffected (Fig. 3). After the procedure, the patient’s pain ceased, with no further evidence of bleeding.

Two weeks after embolisation, the patient complained of a new constant pain over the liver. She was well and apyrexial with minimal jaundice but a firm, mobile, and tender gallbladder was now palpable. Ultrasound showed an enlarged, thickened gallbladder with echogenic areas interpreted as ‘stones and sludge’, a dilated cystic duct but normal bile ducts. Repeat gastroscopy and scintiscan were normal.

A laparotomy was performed. The gallbladder was oedematous, full of blood clot and clot was evacuated from the cystic and common bile ducts. The cystic artery was pulsatile and the blood supply to the gallbladder had not been compromised by the embolisation procedure. A cholecystectomy was performed and T-tube cholangiogram 14 days post-operatively was normal. Six months later the

Fig. 1 Selective hepatic arteriogram. Early arterial phase with early portal vein filling at site of fistula (arrow).

Fig. 2 Selective hepatic arteriogram. Late phase showing contrast medium in common bile duct (arrow).
patients with diffuse parenchymal liver disease. Two
of the six patients undergoing such surgical pro-
cedures for control of haemobilia died.\(^4\)\(^5\) Obviously
no conclusions can be drawn from comparisons
between such small numbers of patients, and assess-
ment of the results of different forms of therapy may
well be made more complicated by bias against
reporting fatalities.

The direct arteriographic approach used here has
a number of advantages. In the 10 patients in whom
it has been used the bleeding site has been accurately
located in all but one.\(^6\) This is of particular advantage
if gastrointestinal haemorrhage after liver biopsy is
not associated with either biliary colic or definite
findings at endoscopy. Furthermore, definitive
therapy can be instituted. One possible approach was
used by Lee et al., who infused adrenaline and
propranolol into the right hepatic artery. After a
half-hour infusion and after severe pain had
developed, bleeding stopped. The other approach is
that of direct embolisation of the bleeding site.

This has been used in two previous cases of post-liver
biopsy haemobilia,\(^9\)\(^11\) and has also been used for the
treatment of haemobilia after blunt trauma to the
liver.\(^8\)\(^13\)\(^14\) Direct embolisation of the arteriovenous-
biliary fistula in our patient led to the immediate
relief of pain and cessation of haemorrhage, the
latter confirmed angiographically. Highly selective
embolisation was possible as a steerable catheter
could be positioned sufficiently close to the bleeding
site. It is clearly desirable that only a small propor-
tion of the liver be deprived of its arterial blood
supply, particularly in the presence of generalised
liver disease; even when such a selective approach is
not possible, emboli tend to stream in towards areas
of high blood flow and thus are likely to obliterate
arteriovenous fistulae at biopsy sites. Emboli
consisting of gelatine foam with collagen were used,
as there is evidence that this combination produces
permanent closure of vascular anomalies.\(^15\) In a case
of haemobilia after blunt trauma treated with
embolisation by gel foam alone, recurrence of a false
aneurysm was documented and repeat embolisation
was required. A further advantage of arteriography
is that accurate localisation of the bleeding site and
demonstration of the hepatic vascular anatomy
provides valuable information for the surgeon
should embolisation prove impossible or un-
successful.

In the patient treated here, although haemorrhage
was successfully arrested by arteriographic embolisa-
tion, surgery was eventually required for a haemo-
cholecyst, a well-described complication of haemob-
ilia. The procedure required to remove the blood
clot from the biliary tree was considerably less
hazardous than a direct approach to the bleeding
site. Similarly, in the first patient treated with this
procedure, by Walters et al., haemorrhage was
successfully arrested after embolisation of a bleeding
arteriovenous fistula. Subsequent evacuation of a
large intrahepatic haematoma was necessary, how-
ever, to relieve pain. We do not know whether
embolisation earlier in these two patients would have
prevented the development of these complications.

De Villasante and his colleagues successfully
embolised a bleeding hepatic artery 14 days after
biopsy and surgery was not required.

In patients who are continuing to bleed into the
biliary tree after percutaneous liver biopsy, direct
embolisation of the biopsy site at arteriography
appears to offer a safe and effective means of
treatment.

References

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