

Remotely inserted venous occlusion catheters for the control of venous haemorrhage

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Summary

This paper describes the use of venous occlusion catheters inserted via the long saphenous vein or its tributaries for control of major retroperitoneal venous haemorrhage. The technique has been applied successfully in 10 cases of trauma and aortocaval fistula. Exposure and insertion are simple and quick and a measure of

control is obtained before exposure of the injury which can then be completely repaired before deflation of the balloon and withdrawal of the catheter.

Introduction

Control of haemorrhage from major retroperitoneal veins presents a surgical challenge, whether it results from trauma or disease. The structure and anatomy of veins renders them liable to further injury during exposure and mobilisation by instruments and vascular clamps.

A technique of remote insertion of venous occlusion

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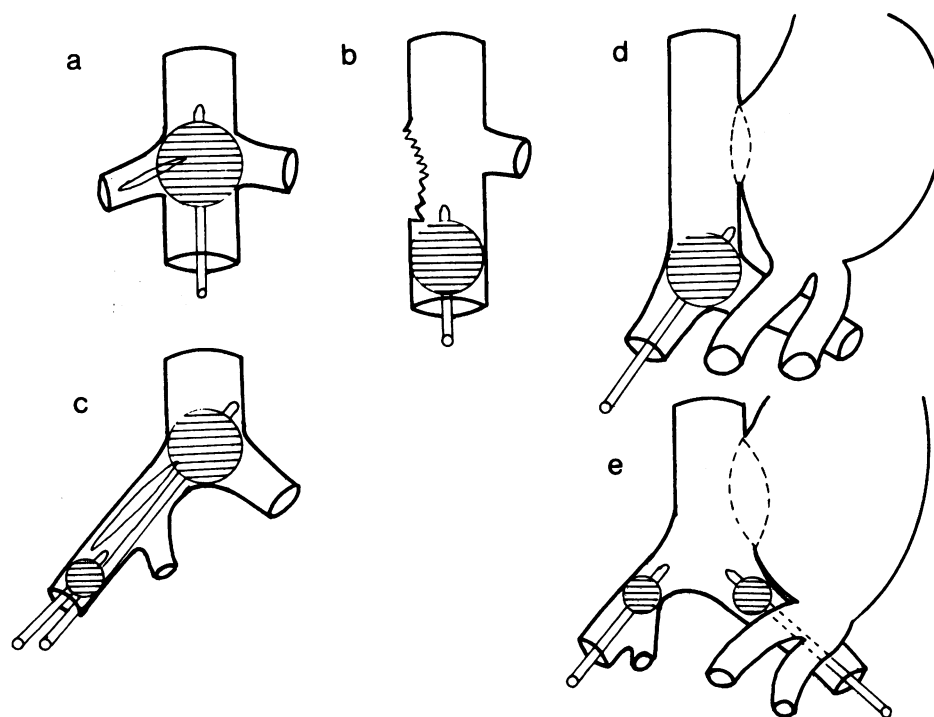


FIG. 1 The application of remotely inserted venous occlusion catheters: a, Stab wound at the renal vein. b, Trauma at nephrectomy. c, Trauma at hysterectomy and hip arthroplasty, 2 cases. d and e, Aortocaval fistula, 4 cases and 2 cases.

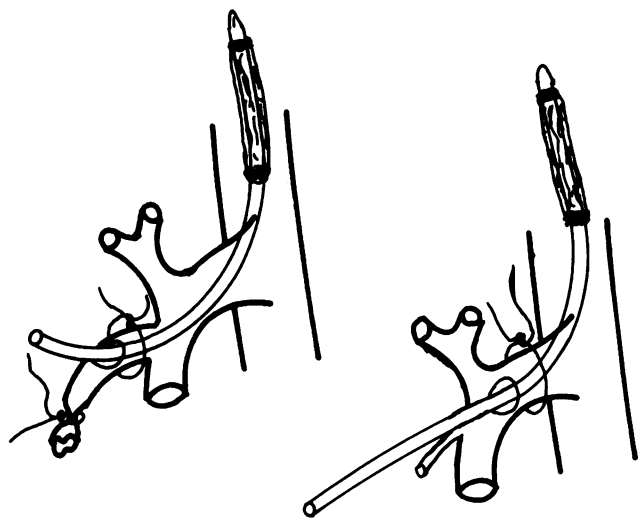


FIG. 2 Technique of catheter insertion at the groin through a tributary or the trunk of the long saphenous vein.

catheters is described which has been used successfully in 10 cases to control these difficult situations. The injuries and balloon applications are shown in Fig. 1.

Method (Fig. 2)

A 4 cm groin incision is made over the appropriate saphenofemoral junction and a standard perivenous exposure performed without ligation. Ligature snares are passed around the saphenous vein as appropriate and the catheter introduced through a venotomy in either a large tributary or the main trunk. The balloon tip is steered proximally and not inflated until exposure of the injury, when the final position is adjusted to obtain maximum control. On completion of the repair, the catheter is withdrawn and the tributary ligated. If the saphenous trunk is used a flush ligation should be performed to prevent local thrombosis, our preference being to preserve the tributaries.

Discussion

Intraluminal balloon tamponade is well known (1,2), the usual technique being to introduce the catheter via the vascular wound. This works reasonably well for thick-

walled arteries but with veins the balloon is easily dislodged with consequent loss of control and the risk of extending the tear. With remote insertion, the intraluminal catheter stabilises the balloon in the vein, leaves the operation site uncluttered, and allows a complete repair before deflation of the balloon. Venous haemorrhage is well controlled by packs but these deny access to the vein. Remote insertion offers the certainty of achieving some measure of control when the packs are removed, as in cases of surgical trauma (Fig. 1b and c).

Access for remote insertion is quick and easy, and can be accomplished while blood and extra assistance is arranged, the packs remaining *in situ*. The technique provides effective control of one or both sides of the injury. It is particularly useful in the presence of a large haematoma, when attempts at exposure may result in further injury. Where the problem can be anticipated, as in aortocaval fistula or abdominal trauma, it is an advantage to have some control before opening the retroperitoneum.

Foley catheters, passed proximally from the groin, via the main vein, have been used (3) but with long-term venous sequelae. These have not occurred in our cases where the described technique was used with specific occlusion catheters. Vascular occlusion catheters are available from a number of suppliers of cardiovascular equipment. We used the Fogarty range which has an 8 G catheter with either a 10 ml balloon, which is suitable for iliac veins, or a 43 ml balloon for the vena cava.

Remote insertion of venous occlusion catheters is a simple technique which is safe and effective in controlling major venous haemorrhage. It is recommended as a manoeuvre preliminary to exploration for suspected venous injury.

References

- 1 Smiley K, Perry MO. Balloon catheter tamponade of major vascular wounds. *Am J Surg* 1971;122:326-7.
- 2 Pearce CW, McCool E, Schmidt FE. Control of bleeding from cardiovascular wounds: Balloon catheter tamponade. *Ann Surg* 1966;163:257-9.
- 3 Turpin I, State D, Schwartz A. Injuries to the inferior vena cava and their management. *Am J Surg* 1977;13:425-31.

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