

Methods and techniques

New technique for portal catheterization in dogs

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The importance of access to the portal venous system in experimental animals has long been recognized. It is difficult to puncture the portal vein repeatedly in animals under experimental conditions which are as near as possible to normal, consequently numerous methods have been described. The London cannula (London, 1935) has been widely used in the past, but more recent authors have preferred an indwelling polythene catheter introduced into the portal vein at operation via either the splenic or a mesenteric vein. This is brought to the surface, and secured so as to be easily accessible to the experimenter, but not to the animal, which can show considerable ingenuity in ridding itself of such a nuisance. Several means of doing this are reported. Canvas or plaster jackets have been used (Denton, Gershoff, and Elvehjem, 1953). The tube has been brought out to the skin in the paravertebral region at the level of the last rib (Waldern, Frost, Harsch, and Blosser, 1963). Cowley and Lombana (1958) resorted to heat sealing the catheter and keeping it subcutaneous, but this has obvious disadvantages.

The method to be described makes use of the fact that a securely anchored gastric pouch cannula is well tolerated for long periods by experimental animals.

THE CANNULA

A standard Gregory type of gastric cannula, 7.5 cm. long and 2.0 cm. in diameter, has been modified by the addition of a small-bore tube inside the barrel of the cannula. One end of this opens onto the surface 0.5 cm. above the perforated flange, and the other end is cut off 0.5 cm. below the level of the distal end of the barrel. The bore of this tube should be such that the portal polythene catheter fits snugly. The cannula can be made of silver or vitalium. If it is not required to have access to the stomach a diaphragm can be placed across the proximal end of the barrel. The modified cannula is shown in Figures 1 and 2.

MODE OF INSERTION

At laparotomy a prominent large splenic vein is selected, and a small disc of splenic capsule and substance 1.5 cm. in diameter is excised where the selected vein leaves the spleen. The spleen is then removed, after ligation of the remaining splenic vessels. A previously siliconed and sterilized soft polythene catheter of suitable diameter to fit the cannula tube is filled with sterile normal saline, and

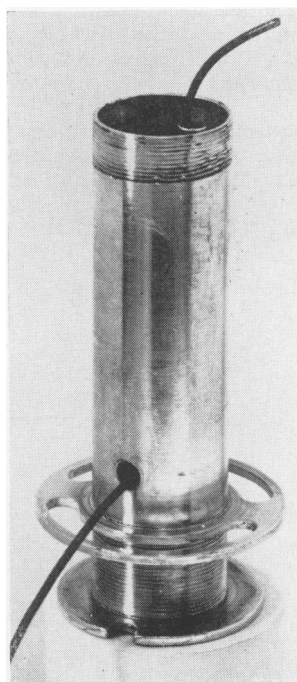


FIG. 1.

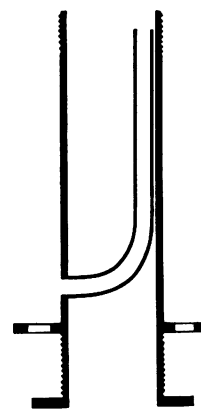


FIG. 2. Overall dimensions of barrel, length 7.5 cm., diameter 2.0 cm.

passed up the splenic vein until the tip lies in the required position in the portal vein. There is no difficulty in identifying the lumen of the vein on the disc of spleen. The gastric cannula is then inserted into the stomach in the usual way, and brought out of a separate wound onto the abdominal wall. The distal end of the polythene catheter is then fed up the small tube from the inside of the abdomen, until the disc of spleen lies against the barrel of the cannula. The splenic capsule is then sutured to the stomach and the abdominal wall. In this way retraction of the splenic vein, and subsequent displacement of the catheter from the portal vein, are prevented (Fig. 3). After closure of the abdomen the portal catheter

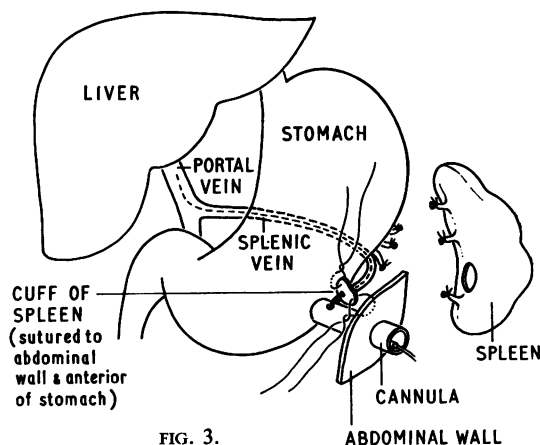


FIG. 3.

is irrigated with heparinized normal saline, and the distal end sealed, coiled up, and stored inside the barrel of the cannula. The cap of the cannula is then screwed on, and the animal is prevented from interfering with the polythene catheter.

Daily irrigation of the catheter with heparinized normal saline is necessary to ensure patency. Although the barrel of the cannula is filled with gastric juice and food for most of the time there has been no infection due to retrograde leakage round the polythene catheter.

REFERENCES

- Cowley, R. A., and Lombana, S. (1958). A method for continuous sampling of the portal venous blood. *Bull. Sch. Med. Maryland*, **43**, 7-8.
- Denton, A. E., Gershoff, S. N., and Elvehjem, C. A. (1953). A new method for cannulating the portal vein of dogs. *J. Biol. Chem.*, **204**, 731-735.
- London, E. S. (1935). Angiostomie und Organestoffwechsel. *All-Union-Inst. Exp. Med., Moscow*.
- Waldern, D. E., Frost, O. L., Harsch, J. A., and Blosser, T. H. (1963). Improved equipment for catheterization of blood vessels of the portal system of cattle. *Amer. J. vet. Res.*, **24**, 212-214.

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