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## Modified technique for selective percutaneous catheterization of the hypogastric artery and its branches

by

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We describe below a modified technique for the selective percutaneous catheterization of the branches of hypogastric artery which reduces trauma to the patient to the greatest possible extent. This technique is of great value in the selective exploration of the pelvic vascular system for both diagnostic (angiological, haemodynamic and radiological) purposes and also therapeutic purposes (endarterial infusion of antineoplastics and radioisotopes).

For example, selective arteriography by means of the catheter provides a method of identifying in particular the symptoms indicative of the spread and encroachment of a pelvic neoplasm.

In particular, it is possible to reveal *changes in the calibre of the vessels through concentric compression, displacement of the vessels or deformation of the lumen through unilateral compression, traction on a large arterial branch, the formation of collateral circulations or arterio-venous shunts* typical of an expanding process.

Angiographic findings are of particular importance in the pathology of the trophoblast as they allow the differential diagnosis to be made between benign and malignant forms and the study of their evolution in the course of therapy<sup>(1, 2, 3, 4)</sup>.

The most characteristic findings are the *opposite cups* in the as yet unexpelled vesicular mole, the « mitotic spindle » in the expelled mole and the « irregular mitotic spindle » in the already discharged malignant vesicular mole.

The angiographic evidence of chorionepitheliomas is characterized by the presence of newly formed circulations, abundant haematic lacunae, clear arterio-venous shunts and rich vascular conglomerates.

Selective catheterization of the branches of the hypogastric artery is also of great value for therapeutic purposes.

The ideal conditions for endoarterial oncochemotherapy are achieved only by regional perfusion with closed circuit extracorporeal circulation which provides maximum concentration of the drug in the tumoral bed with minimum immediate toxicity.

It is difficult to achieve at pelvic level the same degree of extracorporeal cir-

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ulation as can be achieved in the limbs because of the impossibility of completely excluding local circulation from general circulation.

One must therefore have recourse to more or less selective endoarterial infusion of antineoplastics. The pelvic douche, consisting of infusion through a catheter located above the bifurcation of the abdominal aorta, produces marked dispersion of the drug through the external iliac arteries.

For instance, if the catheter is introduced as far as the uterine arteries, it is possible to carry out antineoplastic therapy of the organ, which it is quite impossible to achieve by any other method. Ceramic microspheres carrying radioisotopes can also be inserted by means of the endoarterial catheter to provide radiotherapy in direct contact with the neoplastic tissues.

Surgical catheterization by Sullivan's method, whether transperitoneal or extra-peritoneal, is the cause of considerable operative trauma, not excluding the danger of detachment or displacement of the catheter.

For this reason, a technique of percutaneous catheterization of the branches of the hypogastric artery was developed several years ago which enables a single arterial region to be reached separately (<sup>5, 6</sup>).

A flexible spiral (A) through which runs a wire (B) is introduced into the femoral artery percutaneously by means of a Seldinger needle as far as the aortic bifurcation. Into the spiral guide is introduced a first precurved Ödman radio-paque catheter (C). By withdrawing the spiral (A) together with the wire (B) the catheter reassumes its shape with its end curved (Fig. 1).

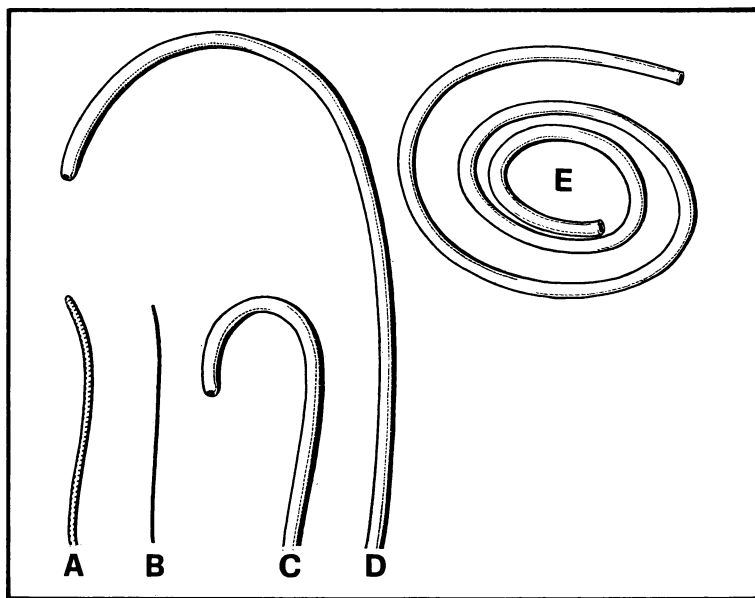


FIG. 1

If the catheter is slowly withdrawn, its tip enters the hypogastric artery (Fig. 2) as a result of its curved tip, the different calibre of the aorta and the common iliac artery and the blood flow. Guided by the Ödman catheter (C) the spiral

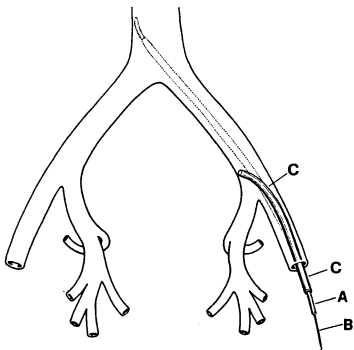


Fig. 2

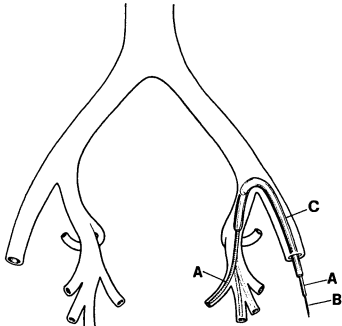


Fig. 3

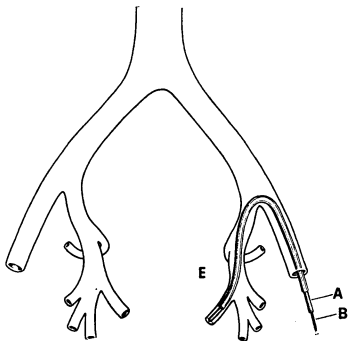


Fig. 4

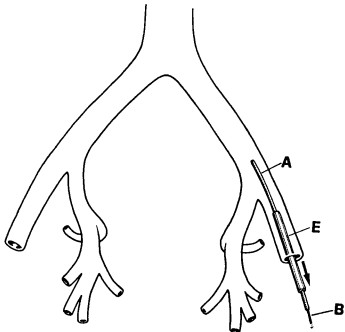


Fig. 5

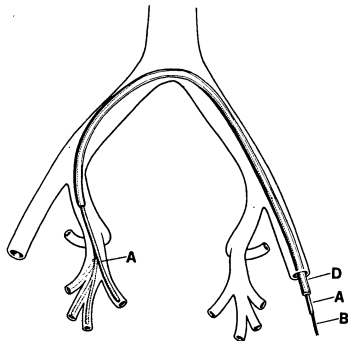


Fig. 6

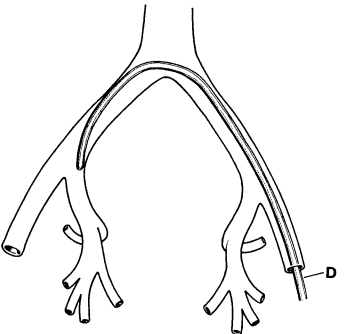


Fig. 7

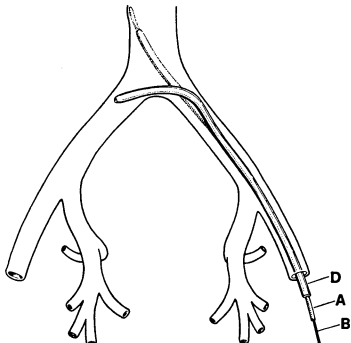


Fig. 8

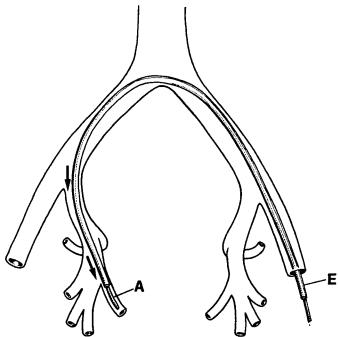


Fig. 9

is introduced deep into the hypogastric artery and enters one of the branches (Fig. 3). The spiral is made rigid by introducing the wire. The Ödman catheter is withdrawn and is substituted by a biologically inert polyethylene catheter (E) (Fig. 4).

For contralateral angiographic visualization it is, of course, necessary to repeat the various phases in the vascular regions on the opposite side with doubled trauma for the patient.

A modification has therefore been made to the above-described technique which, in our opinion, deserves to be given prominence:

The spiral (A) containing the wire (B) is introduced once again into the guide of the inert polyethylene catheter (E) which is partly withdrawn as far as the common iliac artery and is pushed beyond the bifurcation of the aorta (Fig. 5).

This permits the introduction of a second Ödman catheter (D) with a wider preformed curve. The spiral is removed and the catheter is slowly withdrawn; because of the nature of the curve and the flow of blood the catheter enters the contralateral common iliac artery (Fig. 6).

The tip of the catheter can be located by radioscopy. By passing it still further, and again because of the curve, its end tends to enter the hypogastric artery instead of the external iliac artery (Fig. 7).

At this point catheterization of the branches of the hypogastric artery can be carried out by the technique described above (Fig. 8 e 9).

The fundamental advantage introduced by this modification can be clearly seen from the above, namely that it permits the exploration of both hypogastric regions by incannulation of *only one* femoral artery.

Trauma for the patient is thereby reduced as much as possible.

### SUMMARY

A modified technique for selective percutaneous catheterization of the hypogastric artery and its branches is described.

This technique permits the exploration of both hypogastric regions by catheterization of *only one* femoral artery.

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