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Catheterization of carotid artery for iliac stenting in rabbits

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Rapid development of vascular lesions similar to humans, in experimental rabbit model, makes the model uniquely suited for study of cellular mechanism of restenosis. The antegrade stent implantation rabbit model of LaDisa *et al*. (2004) does not produce vascular injury and preserves the flow domain near the site of an implanted stent as compared with previous retrograde models of stent implantation in rabbit iliac arteries (Folts *et al*., 1991) to evaluate clot formation *in vivo*. Retrograde trans-femoral rabbit model of vascular stenting (Garasic *et al*., 2000; Herdeg *et al*., 2003) led to an unacceptably high rate of vascular compromise in the limbs secondary to vascular injury. Further, retrograde model may introduce alterations in the localized flow environment distal to the stent, subsequently influencing cellular proliferation within the stented region. Hence, to over come disadvantages and increase the efficacy of the catheterization procedure, we tried normograde trans-carotid approach for iliac artery stenting in rabbits.

In the present study, randomly bred, 21 apparently healthy New Zealand white adult

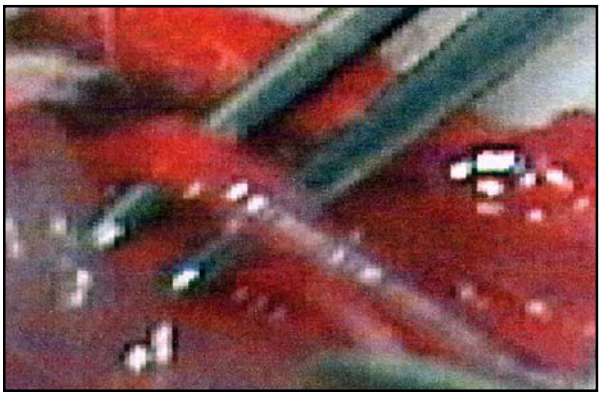

Fig. 1: Isolation of carotid artery.

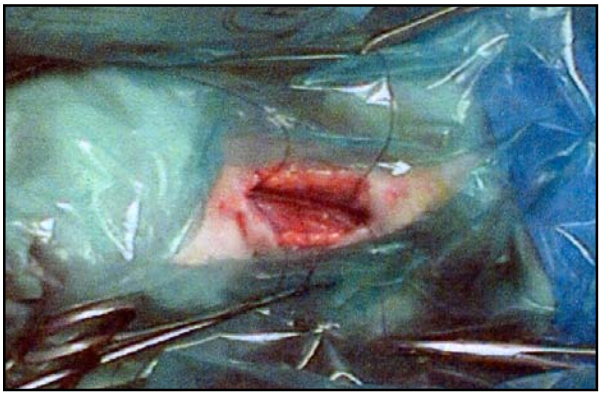

Fig. 2: Pre-placement of three ligatures over carotid artery.

Fig. 3: Introduction of 24 G intra-cath.

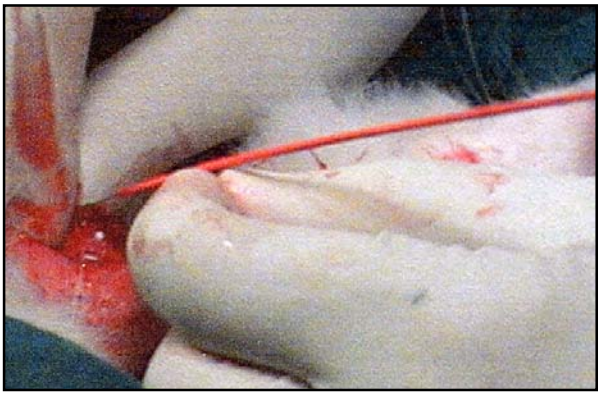

Fig. 4: Introduction of 5 Fr sheath.

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rabbits of either sex, about 8 months of age with mean body wt of 2.16 kg (range: 1.65-3.00 kg) were used. A day prior to the experiment, animals were weighed and ventral neck region was prepared for aseptic intervention. The feed was reduced to half of the usual quantity on the day of operation.

Animals were secured in dorsal recumbency with head and neck fully extended to ensure a patent airway. Skin on the ventral neck region was painted with povidone iodine solution. At the site of entry, a small nick on skin was made with B.P. blade No. 15 and capillary oozing and minor arterial bleeding was controlled using electrocautery pen. Muscles were separated bluntly to expose (Fig. 1). The carotid artery was securely held by pre-placement of three polyglactin-910 (3-0) ligatures in cranial, middle and caudal positions (Fig. 2). Secured carotid portion was instilled with 2-3 drops each of lignocaine 2% and papaverine to produce vasodilatation (Papaverine HCl, STNEX Pharmaceutical Pvt. Ltd., Mumbai).

The artery was cannulated using a 24 G intracath and guide wire was advanced under fluoroscopic imaging (Fig. 3). With steady hold on carotid artery, the introducer sheath (5 Fr) was progressed into the carotid artery for angiogram and stenting external iliac artery (Fig. 4). The rabbits recovered from anaesthesia uneventfully. Postoperatively, Inj. Enrofloxacin 5 mg/kg i.m. s.i.d. and Inj. Meloxicam 0.05 mg/kg i.m. s.i.d. were given for 3 days.

In this study, a variation in rabbit carotid anatomical location was not detected as reported by Lee *et al.* (1994). The introduction of stent delivery catheters through the left carotid artery facilitated access to the distal iliac arteries.

A 5 F introducer sheath (LaDisa *et al*., 2005) inserted into the left carotid artery through a small incision was sufficient to pass the stent but difficult to further it into the carotid artery due to small size of the animal. Local instillation of lignocaine and Papaverine drops desensitized vagus and adequately dilated carotid artery to enable catheterization with the 5 F introducer sheath.

Carotid catheterization of rabbits weighing 1.5-3 kg was performed successfully under anaesthesia using 5 F introducer sheath with check-valve and side-arm (Cheneau *et al*., 2003; Palmaz *et al*., 1986).

It was concluded that normograde catheterization of carotid artery for iliac artery stenting was reproducible and yielded consistent and satisfactory results.

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