ARTERIAL GRAFT AND ENDARTERECTOMY IN RECONSTITUTION OF
THE COMMON CAROTID ARTERY TWO YEARS
FOLLOWING LIGATION

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Developments in the surgery of blood vessels and increasing interest in factors
underlying cerebral ischemia have led to attempts to restore the internal carotid
circulation after occlusion by obliterator disease.4,4,5

This is a report of reconstitution of the common carotid artery by endarterec-
tomy and homograft, 2 years after its surgical ligation.

CASE REPORT

A 44-year-old man was admitted to the hospital on May 1, 1956, because of difficulty in the
use of his right arm and leg for 1 week.

Two years previously, he had been treated in a hospital elsewhere for subarachnoid
hemorrhage, characterized by malaise for 1 day, followed by severe headache, stiff neck,
vomiting, and drowsiness, but without focal neurological disturbance. Initially, the spinal
fluid was bloody; later it was deeply orange in color. An angiogram made on the 19th day
showed no abnormality. On the 29th day, the left common carotid artery was tied 3 cm.
proximal to its bifurcation. Recovery was complete except for a minor impairment of mem-
ory, and the patient returned to his work as an attendant in a filling station.

Approximately 2 years after the ligation of the common carotid artery, and 1 week before
his present admission, movements of his right arm and leg became awkward. He dropped
objects held in the right hand, and was unable to use this hand in eating. Weakness of the
right leg was observed, particularly when he attempted to arise from the sitting position. He
was forced to give up his work.

By the time of his admission to the hospital, most of these symptoms had disappeared,
and on neurological examination only weakness of dorsiflexion of the right foot was found.
The operative site in his neck was well healed and a definite, though diminished, carotid pulse
could be felt above this point.

Angiography, May 9, 1956. On the right side, normal filling and distribution of the in-
ternal carotid, anterior and middle cerebral vessels were demonstrated. On the left, the needle
was inserted into the vessel above the cervical scar, and although the external carotid artery
was well visualized, the internal carotid artery filled only to the base of the skull (Fig. 1).

The episode of right hemiparesis was interpreted to be the result of cerebral vascular
insufficiency in the distribution of the left carotid, based on the surgical ligation performed
2 years previously. Because no aneurysm or other vascular lesion was evident in the left
carotid angiogram made before ligation of the common carotid, it was decided to try to
re-establish blood flow through the left carotid system.

Operation, May 24, 1956. The carotid bifurcation in the left side of the neck was exposed.
Although somewhat diminished in caliber, both the external and the internal carotid arteries
were patent and pulsating. With occlusion of the external carotid artery, a good back flow
through the internal carotid artery was demonstrated. The entire length of the common
carotid artery from its bifurcation to the arch of the aorta was exposed, necessitating an in-
cision down the neck and over the clavicle, resection of the medial portion of the clavicle, and
splitting of the sternum to its midportion with a Lebsche knife (Fig. 2). Obliterating the lu-
men of the common carotid artery from the aorta to the bifurcation was a firm organized thrombus, and surrounding the upper segment of the artery and its bifurcation was a dense scar, marking the site of the previous ligation. It was felt that blood flow could be re-established between the common carotid artery below the ligation and the internal carotid artery above. Therefore, the thrombus was removed by the use of a circular intraluminal stripper (Fig. 3) as employed for endarterectomy in the lower extremities.2 Despite the fact that the thrombus had been in place for 2 years, it was relatively easy to insert the stripper between it and the normal intima and to dissect the clot from the wall of the vessel. Slight resistance was felt as the stripper entered the aortic arch, and immediately thereafter the loosened thrombus (measuring 17 cm. in length) was blown out the open end of the carotid artery by a gush of blood.

Because of the injury of the vessel at the point of its previous ligation, it was necessary to excise 5 cm. of the common carotid artery and a short cuff on each side above its bifurcation. A lyophilized iliac homograft was used to bridge the lower segment of the common carotid artery to the internal carotid artery, the external carotid artery being sacrificed (Fig. 3). Upon release of the occluding clamps, a bounding arterial pulse occurred in the carotid artery, and its caliber was greatly increased.

Apart from a paralysis of the mandibular branch of the left facial nerve, there were no postoperative difficulties.

Postoperative Angiography, July 9, 1956, 7 weeks after operation. A left common carotid arteriogram revealed continued patency of the left common carotid artery and a normal pattern of cerebral vessels (Fig. 4).