CEREBRAL ANGIOGRAPHY: A NEW TECHNIQUE
CATHETERIZATION OF THE COMMON CAROTID ARTERY VIA THE
SUPERFICIAL TEMPORAL ARTERY

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METHODS of catheterization of peripheral arteries have been developed in recent years and applied to both physiologic studies4,7,8,11 and intra-arterial injection of drugs. Fractionated administration of nitrogen mustards into the external carotid system via a plastic catheter introduced through a peripheral artery has been used as a palliative measure in the treatment of malignancies of the head and neck.2,6,13 It seemed to us, therefore, that a satisfactory application of such a technique to the internal or common carotid artery would offer a method of cerebral angiography devoid of the hazards of direct trauma to the carotid arteries and adjacent structures incident to presently employed percutaneous and open techniques.

Catheterization techniques have been applied to cerebral angiography in several ways. Radner9 has developed a method of vertebral angiography in which, under fluoroscopic control, a catheter is passed up the radial artery to the vertebral artery. It is a complicated technique and, to our knowledge, has not been applied to carotid angiography. Jaeger and Whitely,5 in 1955, reported an intravascular intubation technique in which a plastic catheter is introduced into the carotid or vertebral artery through a needle placed percutaneously into the appropriate vessel. These authors point out the advantages of their method: (1) elimination of the danger of extravascular injection, thus making Thorotrast a more desirable medium, (2) prevention of mechanical damage to the intima of the artery with reduction of complications related thereto, (3) precise injection of the internal carotid artery is possible without puncturing that vessel, (4) elimination of the strain of maintaining a sharp needle immobile in the artery, (5) freedom for proper positioning, and (6) allowance for a leisurely, accurate study. The chief disadvantages of their technique would seem to be: (1) the necessity for special equipment, not readily available, and (2) the continued necessity of the trauma and sequelae incident to puncture of a major artery. We believe our method combines the essential advantages outlined by these authors and eliminates the disadvantages.

The superficial temporal artery was selected as the vessel of entry into

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the carotid system because of its size, accessibility, relatively straight course, and because it can be sacrificed with impunity. The external carotid artery terminates between the upper part of the parotid gland and the back of the neck of the mandible by giving off the internal maxillary artery and continuing in almost a linear fashion as the superficial temporal artery which emerges from the parotid gland immediately inferior to the zygoma. Over the zygomatic process and in front of the auricle it is quite superficial, being covered only by skin and fascia and can easily be felt pulsating. In this region it is accompanied by the auriculotemporal nerve, which is posterior to it, and by its vein which has no constant position, but is often superficial to it. Temporal and zygomatic branches of the facial nerve also emerge from the upper border of the parotid gland, but are well anterior to the artery (Fig. 1). Approximately 2-5 cm. above the zygoma, the artery ends by dividing into frontal and parietal branches.

**TECHNIQUE**

Because of certain difficulties encountered in the development of this method, we feel it is important to describe in some detail the techniques employed.

Only a small area in the lower temporal region need be shaved. Under local anesthesia, a vertical incision in the skin, approximately 2 cm. long, is made in the preauricular region over the palpable temporal artery. The lower end of the incision extends to the lower border of the zygoma. The edges of the skin are slightly undermined and small hemostats are applied to the subcutaneous tissue for retraction. Fascia is thus exposed under which the artery can be seen or felt pulsating. It is