Extracranial Aneurysms of the Internal Carotid Artery

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Summary. Aneurysm of the internal carotid artery in its cervical portion is not a benign lesion. A sufficient number of cases has been reported to serve as a warning that a unilateral lump in the throat may be an aneurysm and should be so regarded until proved otherwise. Neurological manifestations, particularly signs and symptoms of cerebral ischemia are common. Angiography is essential for diagnosis and provides valuable information regarding the size and location of the lesion, in addition to demonstrating associated cerebral hemodynamic disturbances.

Aneurysmes extra-craniens de l'artère carotide interne
Résumé. L'anévrysme de l'artère carotide interne dans son segment cervical n'est pas une lésion bénigne. Un certain nombre de cas ont été observés, utilisés pour nous avertir qu'une masse unilatérale dans la gorge peut être un anévrysme et doit être considéré comme tel jusqu'à preuve du contraire. Les manifestations neurologiques, les signes particuliers et les symptômes d'ischémie cérébrale sont communs. L'angiographie est essentielle pour le diagnostic et apporte des informations de valeur quant à la taille et à la localisation de la lésion, en plus des troubles hémodynamiques cérébraux démonstrés associés.

Extracranielle Aneurysmen der A. carotis interna
Zusammenfassung. Aneurysmen der A. carotis int. im Halsabschnitt können neurologische Ausfallserscheinungen und auch Symptome einer cerebralen Mangelversorgung verursachen. Die Arteriographie ist zur Diagnose unbedingt erforderlich, damit kann die Lokalisation und die Größe des Aneurysmas bestimmt werden, auch lassen sich damit die cerebralen hämodynamischen Veränderungen erkennen. Ausführlicher Bericht über die Genese dieser Aneurysmen.

Aneurysm of the internal carotid artery in its cervical portion is not as rare as once believed [34, 36, 38, 43]. The more common etiological factors are arteriosclerosis, congenital or developmental defects, trauma, and infection. Ionizing radiation, syphilis, and certain connective tissue disorders are more unusual causes.

During the past 9 years, 20 cases of extracranial internal carotid artery aneurysms have been studied at the University of California Hospital and these form the basis of this report. Five of these cases were arteriosclerotic in origin, 7 congenital or developmental, 6 traumatic, and 2 resulted from local infection.

Arteriosclerotic

Atherosclerotic aneurysms of the extracranial internal carotid artery are generally seen in elderly patients and are usually situated just distal to the common carotid bifurcation in areas of severe atherosclerotic involvement [11, 13, 29, 47, 50, 57, 65, 68, 71, 73, 74]. The mechanism of formation of these aneurysms has been the subject of much discussion. Some authors believe that although lipid metabolism may be important, local factors play the initial and perhaps predominant role, i.e., deposition of fibrin and other blood substances in the intima, accumulation of ground substance, disruption of elastic lamellae, and perhaps disturbances of circulation in the vasa vasorum. Formation of atheroma may weaken the wall, and atheromatous ulcers in particular may be the basis for aneurysm formation in some cases [16, 25, 58, 76].

The following 5 cases are examples of arteriosclerotic aneurysms of the extracranial internal carotid artery.

Case No. 1. This 54 year old diabetic man was admitted to another hospital because of a confused and disoriented state, and slurred speech. He complained of some dysphasia and a mass was noted on the left side of his throat, which extended from the lower pole of the tonsillar fossa to the arytenoid cartilage. The preoperative diagnosis was that of a parapharyngeal abscess. The mass was incised and an unknown amount of blood clot was removed. The patient was then transferred to the University of California Medical Center at which time there was a large pulsating mass in the left neck with a thrill and bruit, and the trachea was deviated to the right. Bilateral carotid angiography via the retrograde femoral approach revealed a 3.5 × 4 cm aneurysm arising from the left carotid artery adjacent to the common carotid bifurcation (Fig. 1). The left internal carotid artery was occluded. Pronounced arteriosclerotic narrowing at the right common carotid artery bifurcation involved the proximal segments of the right internal and external carotid arteries. Surgical exploration revealed a large aneurysm, 15 × 10 cm in diameter, adjacent to the left common carotid bifurcation. The internal carotid artery could not be identified. The aneurysm, containing thick walls with considerable clot, was excised and a saphenous vein graft was placed from the common carotid to the external carotid artery. The histologic examination revealed "thrombus and hemorrhagic fibrous tissue".

Case No. 2. This 64 year old man was admitted to the hospital complaining of transient light-headedness of 4 months' duration. He had a history of claudication of the right calf for 5 years. One year before this admission he had undergone an aortoiliac dacron replacement graft with bilateral lumbar sympathectomy for severe arteriosclerosis of the aorta and common iliac arteries. Arteriography revealed occlusion of the left external carotid artery at its origin. The proximal left internal carotid artery was narrowed moderately and a small
aneurysm of 6 × 9 mm diameter arose from the internal carotid artery 2 cm distal to the bifurcation of the common carotid artery. At surgery, the aneurysm appeared somewhat larger, measuring 1.5 × 2 cm in diameter. It was excised along with the stenotic segment of the left internal carotid artery and a saphenous vein graft was placed. The histologic report described a saccular atherosclerotic aneurysm.

Case No. 5. This 60 year old man had a history of claudication of both legs and had experienced at least 4 blackouts within the last 10 years. Arteriography revealed aneurysmal dilatation and tortuosity of the basilar artery. A right carotid arteriogram demonstrated a 1.8 × 1.3 cm aneurysm of the cervical internal carotid artery 7 cm above the bifurcation, at the base of the skull. The result of serologic examination was negative. During an

Fig. 1. case No. 1. Left common carotid arteriogram, lateral projection. A 3.5 × 4 cm aneurysm originates from the left carotid artery adjacent to the common carotid bifurcation. The left internal carotid artery is occluded. At surgery the aneurysm was considerably larger and contained thick walls with laminated clot.

Case No. 3. This 46 year old woman was admitted to the hospital with known bilateral renal artery stenosis and hypertension. An aortic arch study revealed moderate stenosis of the origins of both internal carotid arteries. A small saccular aneurysm, 6 × 6 mm in diameter, arose from the left internal carotid artery midway between the bifurcation of the common carotid artery and the carotid canal. The lesion was asymptomatic and no treatment was planned.

Case No. 4. This 69 year old woman, with a long history of hypertension and angina pectoris had sudden right-sided headache and confusion which progressed to stupor. Lumbar puncture revealed bloody cerebrospinal fluid and an elevated pressure. The patient improved with steroid treatment but 2 weeks later had another subarachnoid hemorrhage accompanied with a generalized seizure and a right hemiparesis. Angiography revealed severe intracranial atherosclerotic disease with an intracranial aneurysm at the internal carotid artery bifurcation on the right. A second aneurysm was seen at the origin of the left posterior inferior cerebellar artery. A third aneurysm measuring 1.8 × 2.0 cm originated from the extracranial internal carotid artery on the left just below the carotid canal (Fig. 2). The origin of the left internal carotid artery at the bifurcation of the common carotid artery was markedly stenotic. The aneurysm of the posterior inferior cerebellar artery was clipped surgically and the patient died of complications following this operation. The result of the serologic examination was negative.

Fig. 2. case No. 4. Left common carotid arteriogram, a) Lateral and b) anteroposterior projections. A 1.8 × 2.0 cm aneurysm arises from the left internal carotid artery just below the carotid canal (open arrows). Note the pronounced arteriosclerotic narrowing of the origin of the left internal carotid artery (closed arrows).

Attempt at aortoiliac thromboendarterectomy a cardiac arrest occurred and the patient died. At necropsy severe arteriosclerosis was noted in the basilar artery, the abdominal aorta, and the iliac vessels. The aneurysm in the neck was not mentioned.