Surgical Treatment of Vertebral Artery Insufficiency Caused by Cervical Spondylosis*

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CERVICAL spondylosis accompanied by arthritic bony spurs that compress the vertebral artery is not uncommon in older people,⁴,¹²,¹³,₂⁵ and is often most severe during rotation and hyperextension of the neck. The most common site of formation of these osteophytes is on the uncinate portion of the vertebrae, which in embryonic stages is the junction of the centrum and lateral masses, called the “neurocentral,” “uncovertebral,” or “Luschka’s” joint. There is disagreement on whether this is a true joint or not.⁵,⁷,¹¹,₁₅ It has been suggested that compression and displacement of one or both vertebral arteries may interfere with circulation in the vertebrobasilar arterial system. To date, few attempts have been made to correct this condition by surgical measures.

The surgical procedure presented here evolved from observations of cadavers with displaced vertebral arteries due to severe osteophytes on the uncinate portion of the vertebrae. The ease with which those lateral osteophytes could be exposed and removed through the anterior approach with excision of the longus colli muscle led us to develop a simple method of removing the hypertrophied uncovertebral joint (uncectomy) without making a burr hole or performing an interbody fusion as described by Bakay and Leslie.¹ Even after the spurs and fibrocartilaginous masses had been removed, the vertebral artery was still kinked due to marked perivascular fibrosis; a crease remained in the adventitia, with evidence of chronic irritation of the vertebral nerve. I therefore advocate excision of the fibrosis including the adventitia and periarterial vertebral nerve, following unroofing of the transverse fora-

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Uncpectomy is done with electric drills or the Hall air drill. The bulk of the lateral osteophyte is removed initially, then the uncovertebral joint up to the depth of the floor of the transverse foramen, cephalad and caudad to the transverse processes (Figs. 1–3). Curettes are used to clean the lateral aspect of the vertebral bodies. The anterior root or costal element of the transverse processes are removed laterally to the tip of the anterior tubercle with a Kerrison punch. Two transverse foramina above and below the interspace are open.

The vertebral artery, thus freed from its compromised bony canal, appears still to be kinked due to adhesions and perivascular fibrosis at the site where the compression had been the most severe. Procaine solution is inserted locally into the arterial wall to prevent arterial spasm and to minimize bleeding from periarterial venous plexuses; this facilitates periarterial stripping. A dural hook is inserted into the thickened area of adventitia, which is incised longitudinally, and the area removed (Fig. 2). Venous bleeding, if encountered, is arrested by application of pieces of Gelfoam inserted in thrombin solution with gentle pressure. The deep structures of the wound are permitted to fall together, and the platysma muscle, subcutaneous layer, and skin are closed in layers. No drain is used.

Convalescence from this operation is surprisingly uneventful. Since no interbody fusion is done, no supporting collar or restriction of neck movement is needed. As a rule, patients are ready to leave the hospital within 7 days after operation.

Summary of 20 Cases

During the 2 years after this operation was devised, 20 patients were operated on. There were 12 men and eight women, ranging in age from 32 to 71 years. All patients had initial and follow-up plain films of the cervical spine.

Arteriography. In all cases, arteriography of both the vertebral and carotid arteries was undertaken by the percutaneous transbrachial retrograde technique first described by Gould, et al.,10 utilizing a Teflon catheter needle and a pressure injector. Six films were taken: three anteroposterior projections of the neck in hyperextension (one in plain hyperextension, one in hyperextension plus extreme rotation to the right, and one in hyperextension plus extreme rotation to the left); two projections of the neck in neutral position (one anteroposterior and one lateral); and one with a Towne projection to visualize the basilar artery and its branches. The patient was asked if any given position had exacerbated the symptoms, and an attempt was then made to simulate this position. A 30 cc bolus of 60% Conray was used for each injection. The procedure was well tolerated. Carotid arteriography was added on the left side.

Clinical Data. The clinical data on these 20 patients are summarized in Table 1. Two patients having a resting blood pressure over 160/90 mm Hg were judged to be hypertensive, and six having a resting blood pressure below 110/70 mm Hg were judged to be hypotensive; two others had postural hypotension.

Vertigo, Dizziness, and Fainting. The most common complaint was the episodes of vertigo or dizziness that occurred in 15 of the 20 cases; 10 had severe rotatory vertigo and five had dizziness. The dizziness was not a sensation of rotation but rather a feeling of instability. Four patients had fainting attacks. These episodes were elicited upon turning the head abruptly to look over the shoulder, on looking upward at the ceiling, or on arising from bed and on changing their posture. These episodes were rarely an isolated symptom but frequently found in association with visual disturbances, sensations of numbness in the arms or legs, cold sweating, nausea and vomiting, but seldom tinnitus or auditory loss. One patient out of the 20 had bilateral tinnitus accompanying a severe rotatory vertigo. Visual disturbances took the form of blurred vision, diplopia, or transient amblropia. Headache, shoulder and neck pain were common.

Neurological Signs. The most commonly observed neurological signs were a positive Romberg, and vertical or diagonal nystagmus seen through the Frenzel glass during the positioning tests of Dix and Hallpike15 and Stenger.24 These were noted in all 20 cases. It has been suggested that this kind of nystagmus indicates vestibular disorder of a central nature;24 thus, it is very important to differentiate it from the vertigo due to a peripheral disorder of the vestibular end organ such as Ménière’s disease and the positional