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## SONOGRAPHIC DIAGNOSIS OF BUCKLING OF THE NECK VESSELS

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### ABSTRACT

The clinical differentiation of pulsatile supraclavicular mass is difficult. It could be aneurysm, buckling, and transmitted pulsation due to neck masses. Aneurysm is the most common impression, and angiography is usually requested. We report 14 cases of buckling of the great vessels of the neck as the cause of right supraclavicular pulsatile mass. All can be diagnosed with realtime sonography, a noninvasive and accurate method.

### INTRODUCTION

Abnormalities of the aorta, aortic arch and innominate artery such as aneurysm, buckling or congenital anomalies can cause pseudo-tumors of the mediastinum,<sup>1,2</sup> pseudo-tumors of the apical lung<sup>3,4</sup> and supraclavicular mass.<sup>2,5</sup> The differential diagnosis of pulsatile supraclavicular mass are buckling, aneurysm, and transmitted pulse of neck masses. It is common for these patients to be referred for angiographic evaluation because of the diagnosis of aneurysm. In our report, we present the clinical and sonographic features in 14 patients with pulsatile neck masses due to buckling of the neck vessels.

### MATERIALS AND METHODS

All patients were examined in the supine position with the neck extended. Using a realtime scanner, both sagittal and transverse sonograms of the pulsatile neck mass on physical examination were obtained. The course, shape, size, and location of innominate, subclavian and common carotid arteries were correlated with the location of the mass.

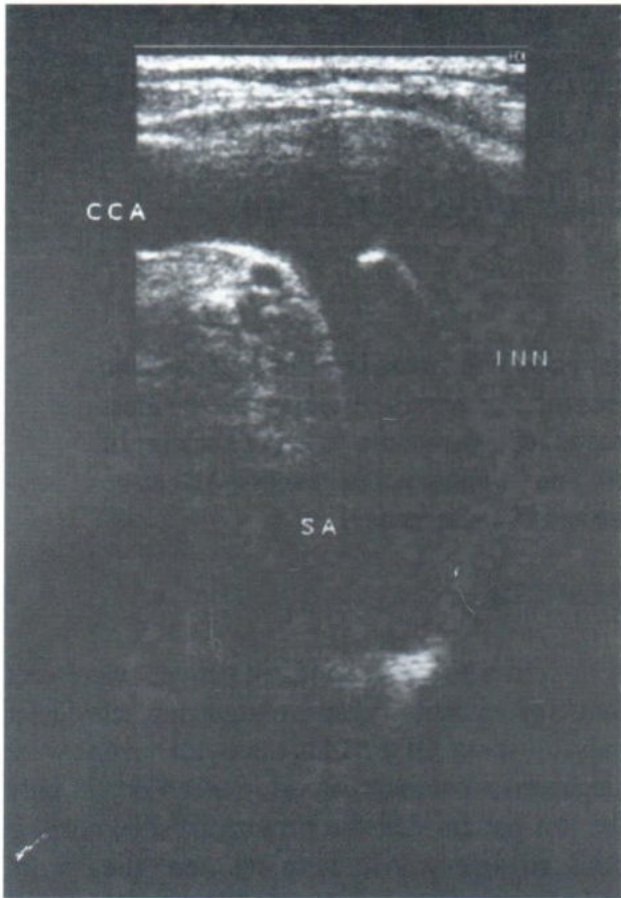
### RESULTS

In a 10-year period, 14 patients were sent for US examination because of right supraclavicular pulsatile mass. Of the 14 patients, all but one were diagnosed as common carotid artery aneurysm, only the last patient that the provisional diagnosis is buckled artery. All were women: they were 48 - 81 years old (mean, 59.75). Eleven patients had longstanding hypertension and 3 were normotensive.

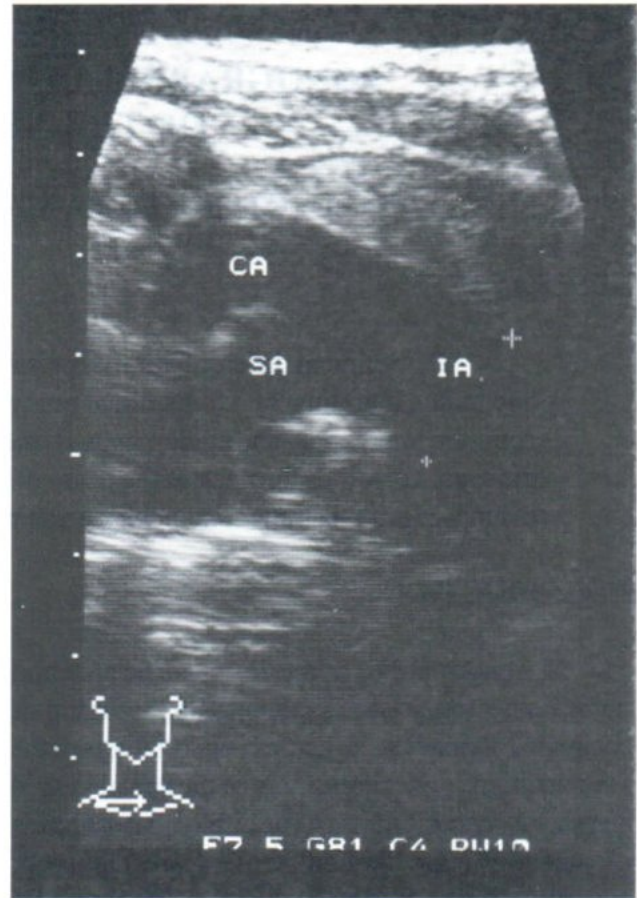
The buckled arteries had a characteristic inverted U-shaped course. The bend in the vessel was very superficial under the skin and corresponded to the supraclavicular pulsatile mass. The pulsatile neck masses corresponded to buckling of the distal innominate artery (Fig. 1) in ten patients and buckling of the proximal right common carotid artery (Fig. 2) in four cases.

Angiography was performed in the first 2 cases and confirmed the sonographic findings. Due to the characteristic appearance of the buckled vessels on sonography, angiography was not done later on.

US = ULTRASOUND



**Fig. 1** Right parasagittal sonogram reveals high and superficial position of the buckling innominate artery (INN) corresponding to the supraclavicular pulsatile mass. CCA= common carotid artery, SA= subclavian artery



**Fig. 2** Transverse sonogram of right supraclavicular fossa demonstrates buckled common carotid artery (CA). IA = innominate artery, SA= subclavian artery

**DISCUSSION**

The normal innominate artery is the first and largest branch of the aorta. It originates from the right side of the aortic arch, runs upward to the right, and bifurcates at the level of the right sternoclavicular junction into the right common carotid and right subclavian arteries. As a result of hypertension and arteriosclerosis, the aorta and innominate artery elongate simultaneously. Aortic elongation elevates the origin of the innominate artery toward the neck. The innominate and common carotid arteries are forced to buckle. The degree of buckling is determined by the length of the artery relative to the space available.

Buckling of the innominate and right common carotid arteries is generally seen in patients over the age of 50 years, and in hypertensive patients.<sup>2,3,6</sup> In most reported series, buckling was more common in women. Clinically, buckled innominate and common carotid arteries present as pulsatile masses, indistinguishable from an aneurysm on physical examination, and the recognition of buckling is clinically significant since their nature is benign.<sup>7-9</sup>

In our experience, buckled artery is not a rare condition and is the sole cause of 14 right

supraclavicular pulsatile masses. Sonography is an effective initial procedure in diagnosing buckled artery and obviates unnecessary angiographic study.

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