Rare Variation of the Axillary Artery

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The third part of the axillary artery unilaterally divides into two major arterial stems, named according to their localization as deep brachial artery and superficial brachial artery (brachial artery). The deep brachial artery gives off the posterior circumflex humeral artery, anterior circumflex humeral artery, subscapular artery, and profunda brachii artery. It continues its course in the arm lateral to the median nerve and terminates by giving a minute twig to the radial artery. The superficial brachial artery is larger in caliber than the deep brachial artery and gives no branches in the arm region. In the cubital fossa it gives the ulnar and the radial arteries. This case is a variant of the axillary artery that has been rarely (0.1–3.2%) documented in the literature. Accurate knowledge of the normal and variant arterial anatomy of the axillary artery is important for clinical procedures in this region. Clin. Anat. 13: 66–68, 2000.

Key words: axillary artery; superficial brachial artery; deep brachial artery

INTRODUCTION

The axillary artery is classically divided into three parts according to the pectoralis minor muscle. Six major branches are given off from these parts of the axillary artery (Williams et al., 1989). Although this is the classical description of the axillary artery, studies by De Garis and Swartley (1928), Trotter et al. (1930), and Huclke (1959) show that there is no fixed pattern for branches of the axillary artery.

The most frequent anatomic variations of the axillary artery are the persistent superficial brachial artery, high division of the brachial artery, and high division of the radial and ulnar arteries (McCormack et al., 1953; Jurjus et al., 1986; Uglietta and Kadir, 1989; Compta, 1991).

We report a case of high division of the axillary artery into a “superficial brachial artery” and “deep brachial artery,” which has rarely been (0.1–3.2%) described (Adachii, 1928; De Garis and Swartley, 1928; Miller, 1939; McCormack et al., 1953).

The variations of the axillary artery can cause problems for plastic and orthopedic surgeons and radiologists in orientation to the region. Therefore, for an accurate diagnosis the variations of the region should be well known.

OBSERVATIONS

The right axillary region of a 63-year-old male Turkish cadaver was exposed during routine dissec-

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branches, the caliber of the deep brachial artery reduced considerably and continued along the radial side of the median nerve. Eight centimeters below the origin, it gave off the profunda brachii artery, which accompanied the radial nerve through the spiral groove on the posterior surface of the humerus. The deep brachial artery crossed the bicipital aponeurosis and terminated by giving a minute branch to the radial artery.

The superficial brachial artery or brachial artery coursed along the ulnar side of the median nerve and gave no branches in the arm. Reaching the cubital fossa, it divided into its two usual terminal branches, the ulnar and radial arteries. The distribution and the course of the latter arteries were normal, as was the branching of the left axillary artery.

**DISCUSSION**

The origin of these anomalies is attributed to defects in the embryonic development of the vascular plexi of the upper limb buds. An arrest at any stage of development, showing regression, retention, or reappearance, may produce various variations in the arterial origins and courses of the major upper limb vessels (Hamilton et al., 1972).

The superficial brachial artery is often considered a high origin of the radial artery. However, there are two distinct variations of the axillary artery. The high origin of the axillary artery emerges from the axillary or brachial artery and continues in the forearm as the radial artery, whereas the superficial brachial artery may or may not be a brachial artery in the sense of...
giving rise to radial and ulnar arteries. De Garis and Swartley (1928) observed 17 (3.3%) cases in their 512 series of upper extremity dissections. Miller (1939) was able to detect only one case (0.2%) in his 480 dissections. In 780 of the McCormack et al. (1953) series, only one (0.12) case of this type was observed. Adachii (1928) observed 13 (3.1%) cases in his 410 axillary artery dissections.

Anomalies of the vascular pattern have been reported to cause delay in the differentiation of the palmar arch. Compta (1991) described a high division of the radial artery together with a superficial palmar arch formed entirely by the ulnar artery. In our case there was no variation concerning the vascular arches of the hand. The pattern of the course and branching of the axillary artery was reported to vary between race and sex (Trotter et al., 1930). The division of the axillary artery into superficial and deep stems was found to be more frequent in black persons (13.4%) than in white (4.6%) (De Garis and Swartley 1928). Therefore, this case can be regarded as one of the rare variations of the axillary artery. In addition, in contrast to the findings above, this case is unique because the superficial branch of the axillary artery gave no branch to the neighboring structures during its course in the arm.

Variations in the origin and course of principal arteries are of significant practical importance for the vascular radiologist and surgeon. Angiographic images with such vascular patterns may lead to confusion in interpretation. Moreover, abnormal branching of the axillary artery itself presents an abnormal relationship to the brachial plexus and other branches of the axillary artery.

Uglietta (1989) reported variations in the major arteries of the upper extremities to be 11–24%. The large percentage of variations makes it worthwhile to take any anomaly of the axillary artery into consideration. In addition, any superficial position of one of the two stems of the axillary artery can make them more vulnerable to trauma (bleeding) and more accessible for cannulation. They may also cause complications to plastic surgeons in raising a radial artery or ulnar artery flap (Fatah et al., 1985). Therefore, both the normal and abnormal anatomy of the region should be well known for accurate diagnostic interpretation.

REFERENCES