VIA MEDICA

CASE REPORT

Folia Morphol.
Vol. 71, No. 2, pp. 121–124

ISSN 0015–5659
www.fm.viamedica.pl

Unilateral high origin of radial artery from axillary artery

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[Received 30 November 2011; Accepted 16 January 2012]

Variations in the vascular system of upper limbs are relatively common, with considerable significance towards the clinical and surgical point of view. The major arterial variations reported are of high origins of radial and ulnar arteries. During routine dissection of an upper extremity in the Department of Anatomy, Medical University of the Americas, Nevis, West Indies, a variation in the origin of the radial artery from the axillary artery was observed in the right upper limb of a 55-year-old female cadaver. The normal and variant origin of the radial artery has pragmatic importance for surgeons and radiologists. Also, the superficial position of an artery makes it vulnerable to injury during cannulation, which may lead to pseudoaneurysm. (Folia Morphol 2012; 71, 2: 121–124)

Key words: radial artery, ulnar artery, axillary artery, brachial artery

INTRODUCTION

The course and branching pattern of the axillary artery varies with race, sex, and ethnic group [2]. Normally the axillary artery is a continuation of the subclavian artery at the outer border of the first rib, and continues as the brachial artery at the lower border of the teres major muscle. The axillary artery gives off six branches from its three parts. During routine dissection we came across a unique branching pattern, which has not been reported in the literature till now. The variant observed was not only rare but also relevant and significant for understanding the formations of the arteries of the limb. The formation, origin, and distribution of blood vessels vary during its development.

Variation of arteries of upper limbs can be found along the axillary, brachial, radial, ulnar arteries or superficial palmar arch in the hand. Among these variations, the most common is high origin of the radial artery from either the axillary or brachial arteries [8].

CASE REPORT

The present case shows the variation of high origin and course of the radial artery in the right upper extremity of a 55-year-old female cadaver during routine dissection in the Anatomy Department of the Medical University of the Americas. The axillary artery began at the lower border of the first rib and continued as the brachial artery at the lower border of the teres major muscle. The axillary artery was divided into three parts by the pectoralis minor muscle. The axillary artery gave four branches from the third part in contrast to its normal three branches. At the lower border of the pectoralis minor muscle there was the origin of the radial artery proximal to the origin of the subscapular artery (Fig. 1). The artery coursed proximal and superficial to the union of two roots of the median nerve in the arm.

In the cubital fossa it pierced the bicipital aponeurosis to reach the superolateral aspect of the forearm and coursed superficially to reach the hand (Fig. 2). The importance of such a variant has to be borne in mind during cannulation and venepunc-

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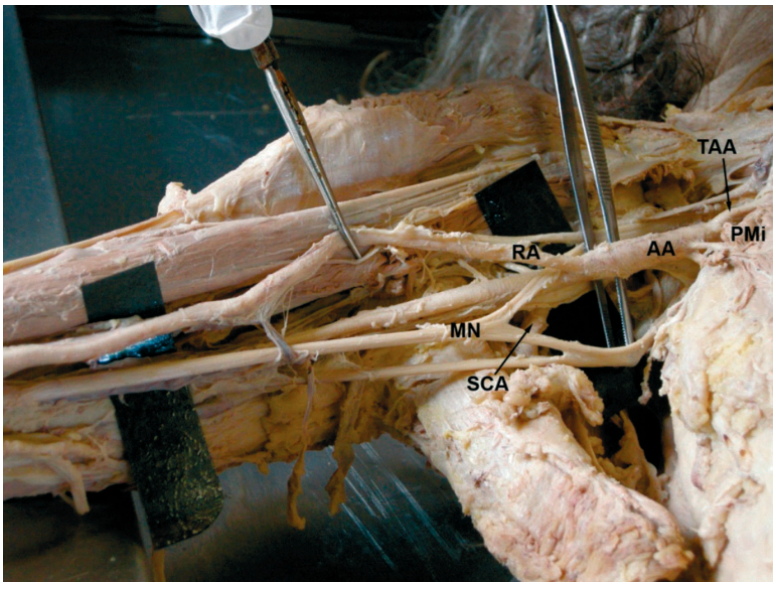

Figure 1. High origin of radial artery (RA) from axillary artery (AA); MN — median nerve; TAA — thoracoacromial artery; SCA — subscapular artery; PMi — pectoralis minor muscle.

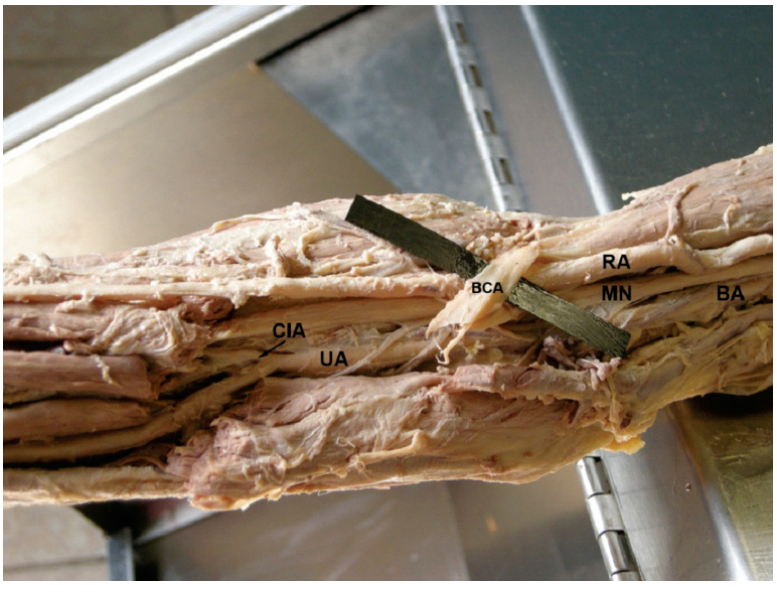

Figure 2. Radial artery (RA) piercing bicipital aponeurosis (BCA) in the cubital fossa; MN — median nerve; BA — brachial artery; UA — ulnar artery; CIA — common interosseous artery.

ture. Such a variation could compress the artery even during sustained contractions of the biceps muscle. The radial artery terminated as a superficial palmar arch in the hand (Fig. 3). There was no deep palmar arch in the hand and the entire hand was supplied by branches of the superficial palmar arch, which was formed by radial and ulnar arteries.

The brachial artery was of smaller calibre and situated deep throughout its course and accompanied by venae comitantes (Fig. 4). The brachial artery gave three branches, namely the profunda brachii, superior ulnar collateral, and inferior ulnar collateral arteries. In the cubital fossa, at the level of the neck of the radius, it continued as ulnar artery, which gave the common interosseous artery.

The left upper limb had a normal arterial pattern of axillary, brachial, radial, and ulnar arteries.

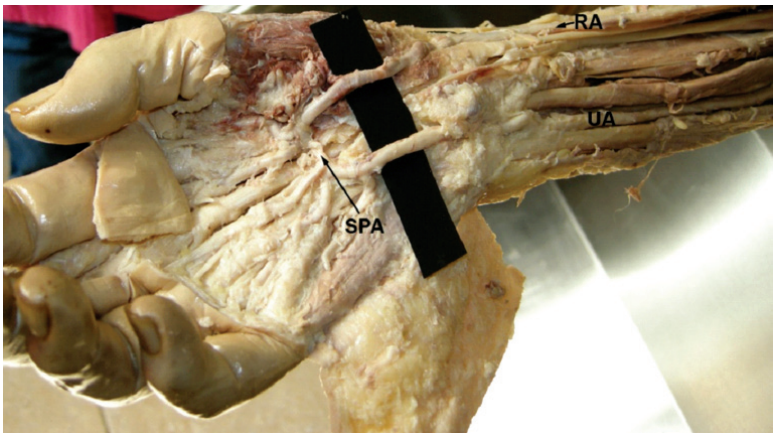

Figure 3. Radial artery (RA) terminates as superficial palmar arch (SPA) in the hand; UA — ulnar artery.

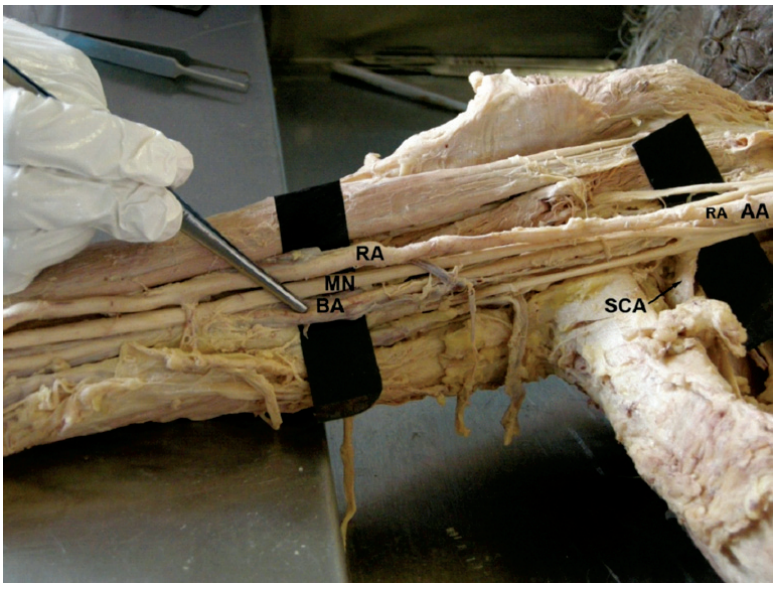

Figure 4. Axillary artery (AA) continues as brachial artery (BA) accompanied by venae comitantes; RA — radial artery; SCA — subscapular artery; MN — median nerve.

DISCUSSION

The term brachioradial artery is used to describe the case when the radial artery takes up a high origin either from the axillary, upper, middle, or lower thirds of the brachial artery [8]. Such anomalous blood vessels may be due to the choice of unusual paths in the primitive vascular plexuses, the persistence of vessels that normally obliterates the disappearance of vessels normally retained, incomplete development and fusions, or absorptions of the parts usually distinct [5].

Daimi et al. [2] and Waghmare et al. [7] reported a high origin of radial artery from the second part of the axillary artery, which coursed superficially and crossed the brachial artery and median nerve from the medial to the lateral side, similarly to the present case.

Balachandra et al. [1] reported an incidence of a radial artery arising from the third part of the axillary artery proximal to the union of two roots of the median nerve, and the presence of a communicating branch between the radial and ulnar arteries in the cubital fossa.

Esfe et al. [3] reported the development of a pseudoaneurysm following the inadvertent cannulation of high origin of the radial artery from the brachial artery.

Many authors have reported a high origin of the radial artery from the brachial artery [4, 6]. The present case is distinct in its high origin, superficial course, and the fact that it pierces the bicipital aponeurosis in the cubital fossa. The superficial course may be hazardous and vulnerable to injury during venepuncture and surgical procedures. On the other hand, its superficial course is helpful for arterial grafting and cardiac catheterisation. Consequently, knowledge of the significance of both normal and variant anatomies of the artery is a must for accurate diagnosis and treatment.

ACKNOWLEDGEMENTS

Our sincere thanks to the faculty members of our university who helped and supported us during the writing of this manuscript.

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