



Anomalous Origin of Profunda Brachii Artery- A Cadaveric Study

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ABSTRACT

Aim: To study the variations in the origin of Profunda Brachii artery.

Material and method: The study was conducted at Department of Anatomy ,Andhra Medical College , Visakhapatnam and Gitam Institute of Medical Sciences and Research on 30 embalmed cadavers.

Results: During our study we noticed anomalies in origin of profunda brachii artery in two cases.

Conclusions: Knowledge of anomalous origin is important for surgeons who operate on patients of fracture in the mid-shaft region & surgical neck of humerus. Variations in the vasculature of upper limb are of clinical importance particularly to the vascular surgeons and those performing angiographic procedures. Lack of the knowledge about these anatomical variations can lead to iatrogenic damage to the vessels while performing any interventional and surgical procedures of upper limb

KEYWORDS

Profunda brachii artery, posterior circumflex humeral artery, axillary artery, brachial artery

INTRODUCTION

The profunda brachii is a large branch from the posteromedial aspect of the brachial artery , distal to teres major. It follows the radial nerve closely and enters the radial groove along with it. It supplies muscular branches, the nutrient artery of humerus and finally divides into terminal radial and middle collateral branches which take part in the anastomoses around the elbow [1].

The posterior circumflex humeral artery is a branch from the third part of axillary artery and runs along with the axillary nerve in the quadrangular space.

In 55% of the cases [2], the profunda brachii is the larger branch issued from the brachial artery (BA). Several variations in the branching pattern of brachial and axillary arteries have been described, mainly related with vessels of the third part [1,3].

In the present study the profunda brachii arise in common trunk along with the posterior circumflex humeral artery from the third part of axillary artery above the tendon of teres major muscle.

AIM:- To study the variations in the origin of profunda brachii artery.

MATERIALS AND METHODS:

During routine dissection process for the undergraduate students in the Department of Anatomy, Andhra Medical College , Visakhapatnam and Gitam Institute of Medical Sciences and Research , Visakhapatnam the variations in the origin of artery profunda brachii were recorded in 30 embalmed cadavers i.e., 60 upper limbs.

OBSERVATIONS:

During the routine dissection process for undergraduate students the following anomalies were observed in the origin of profunda brachii artery.

Two out of 60 dissected upper limbs have shown this anomalous origin of profunda brachii in common with posterior circumflex humeral artery from the third part of axillary artery .

In the first case the anomaly was observed unilaterally in the right

upper limb. The profunda brachii arised as a common trunk with the posterior circumflex humeral artery from the third part of axillary artery. The common trunk has given rise to the posterior circumflex humeral artery and the Profunda Brachii artery. In this case the profunda brachii artery is very thin when compared to the posterior circumflex humeral artery. After origin the posterior circumflex humeral artery ran a normal course along with the axillary nerve in the quadrangular space (**Image 1**). The profunda brachii coursed along with the radial nerve in the spiral groove (**Image 1**). Its relation with the median nerve was normal. The brachial artery has given few muscular braches and its remaining course and termination was normal. The remaining branches of axillary artery were normal in their course.

In the second case the anomaly was observed in the left upper limb. The profunda brachii had a common origin with the posterior circumflex humeral artery. The common trunk passed between the two roots of median nerve and gave posterior circumflex humeral artery and the Profunda brachii artery which were of equal caliber(**Image 2**). Thereafter the profunda brachii coursed normally along with the radial nerve in the spiral groove.. The remaining course, branches and termination of brachial artery and axillary artery were normal. In this case the median nerve crossed posterior to brachial artery as seen in **Image 2**.

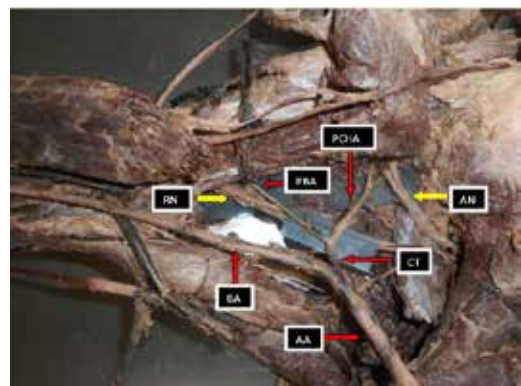


Image – 1

AA- Axillary artery

CT – Common Trunk giving rise to Posterior circumflex humeral artery and Profunda brachii artery

AN – Axillary Nerve

PCHA - Posterior circumflex humeral artery

PBA - Profunda brachii artery

RN – Radial nerve

BA – Brachial artery

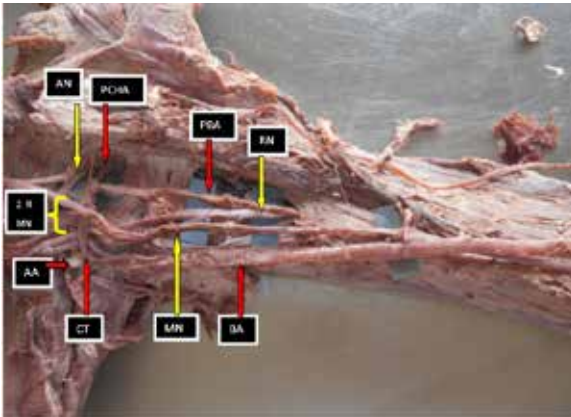


Image – 2

AA- Axillary artery

2R MN- Two roots of median nerve.

CT – Common Trunk giving rise to Posterior circumflex humeral artery and Profunda brachii artery

PCHA - Posterior circumflex humeral artery

AN – Axillary Nerve

PBA - Profunda brachii artery

MN – Median Nerve

BA – Brachial artery

RN – Radial nerve

DISCUSSION:

According to Charles et al there are 7 types of origins for profunda brachii artery. In Type I the profunda brachii artery is the branch of brachial artery, Type Ia the profunda brachii artery originates by 2 separate branches, Type Ib the profunda brachii artery originates by 3 separate branches, In Type II the profunda brachii artery arises as a common trunk with superior or ulnar collateral artery, In Type III the profunda brachii artery arises at lower border of teres major so can be considered to be arising from axillary or brachial, In Type IV profunda brachii artery is the branch of 3rd part of axillary artery. In Type V profunda brachii artery arises as a common trunk with posterior circumflex humeral. In Type VI profunda brachii artery arises as a common trunk with subscapular and both circumflex humerals from axillary artery and in Type VII profunda brachii artery is absent [4].

In the present study the anomaly in both cases falls into type V as per the classification of Charles et al.

According to Arey LB 1957 [5], the unusual blood vessels may be due to

a. The choice of unusual paths in primitive vascular plexuses

b. The persistence of vessels which are normally obliterated

c. The disappearance of vessels which are normally retained

d. Incomplete development and fusion and absorption of the parts which are usually distinct.

Axis artery of upper limb develops from lateral branch of seventh inter segmental artery [6]

Variations in branching pattern of axillary artery are due to defects in embryonic development of the vascular plexus of upper limb bud. This may be due to an arrest at any stage of development of vessels followed by regression, retention or reappearance, thus leading to variations in the arterial origin and course of major upper limb vessels[7,8,9,10,11]. Such anomalous branching pattern may represent persisting branches of the capillary plexus of the developing limb buds and their unusual course may be a cause for concern to the vascular radiologists and surgeons, and may lead to complications in surgeries involving the axilla and pectoral regions. [8,9]

In the second case the median nerve crossed the brachial artery posteriorly. After that its course was normal. In such cases the brachial artery is termed as superficial brachial artery and can be of clinical importance [12,13,14]. Brachial artery, while crossing over the median nerve, can lay over it for some distance and compress the nerve. The diagnosis of this condition could be confusing because the symptoms resemble radiculopathy or carpal tunnel syndrome [12]. The superficial position of the brachial artery renders it vulnerable to trauma, however it is easily accessible for cannulation when required. Also SBA may be mistaken for a vein and accidental intra arterial injection of drugs may result in serious consequences [13,14].

CONCLUSIONS:

Knowledge of anomalous origin is important for surgeons who operate on patients of fracture in the mid- shaft region & surgical neck of humerus [15].

Variations in the vasculature of upper limb are of clinical importance particularly to the vascular surgeons and those performing angiographic procedures. Lack of the knowledge about these anatomical variations can lead to iatrogenic damage to the vessels while performing any interventional and surgical procedures of upper limb .

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