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Original Research Article

Variations in the Origin of Ulnar Artery –A Cadaveric Study

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Abstract

The knowledge of the anatomy of a region becomes very important for doctors of different specialties both in making accurate diagnosis and to give a proper treatment for an individual. Radiologists need to understand the existence of variations in an artery in order to reduce the error in making diagnosis. The ulnar artery is the major artery of the front of forearm and the knowledge of its anatomy and variations in its origin is necessary in all specialties. The study was conducted in Department of Anatomy, Government Stanley Medical College, Chennai and 50 upper limbs comprising from 25 adult human cadavers preserved by embalming with formalin were studied by conventional dissection method. The ulnar artery arises as the terminal branch of brachial artery in significant proportion. The ulnar artery may arise proximal to the elbow or high up in the axilla. 96% of the specimens the ulnar artery arises from the brachial artery as a terminal branch. High origins, the origin of ulnar artery from lower third brachial artery was seen in 2% and from the axillary artery in 2%.

Keywords: Ulnar Artery, Brachial Artery, Axillary Artery.

INTRODUCTION

The ulnar artery arises from the brachial artery. It is the larger of the two terminal branches of the brachial artery, the other being radial artery. It extends from the level of neck of radius, first it runs downwards and medially in a oblique course in the front of upper third of the forearm, then it descends downwards in a vertical course in the lower two-third of medial part of forearm. It pierces the deep fascia just above the wrist and then runs superficial to flexor retinaculum to reach the palm where it divides into a superficial and deep branch at the level of pisiform bone. Normally the hand is supplied by blood from the both ulnar and radial arteries. Both the arteries undergo considerable anastomosis in the hand. So if the blood supply from one of the two arteries is cut off, the other artery should supply adequate blood to the hand. Few people lack this dual blood supply. Sometimes the diameter of the ulnar artery may be large enough to use it for cannulation. The anatomical knowledge of both radial and ulnar artery and their anastomoses becomes important in cases of coronary artery bypass grafting. The ulnar artery is used in plastic surgery. The fasciocutaneous perforators from the ulnar artery used in many forearm flaps on the ulnar side while filling the raw areas. The anatomic knowledge must be applied from the surgeon's point of view.

Aim of the study

To study the source of origin of ulnar artery in 50 upper limb specimens from 25 adult human cadavers.

MATERIALS AND METHODS

The study was conducted in the Department of Anatomy, Government Stanley Medical College and Hospital, Chennai. 50 upper limb comprising from 25 adult human cadavers (18 male and 7 female) preserved by embalming with formalin were studied by conventional dissection method.

RESULTS

The ulnar arteries in 50 specimens comprising of 25 adult human cadavers are studied. Out of the 50 specimens studied in 48 (96%) specimens the ulnar artery arises as a terminal branch of brachial artery (Fig-1). In 1 (2%) specimen the ulnar artery shows higher origin and it arises from the lower 1/3 of the brachial artery above the level of the elbow or in the lower arm (Fig-2). In 1 (2%) specimen the ulnar artery shows higher origin from the axillary artery in the axilla (Fig-3).

Fig-1: Origin of Ulnar artery from Brachial artery

Fig-2: High origin of ulnar artery from lower third of brachial artery

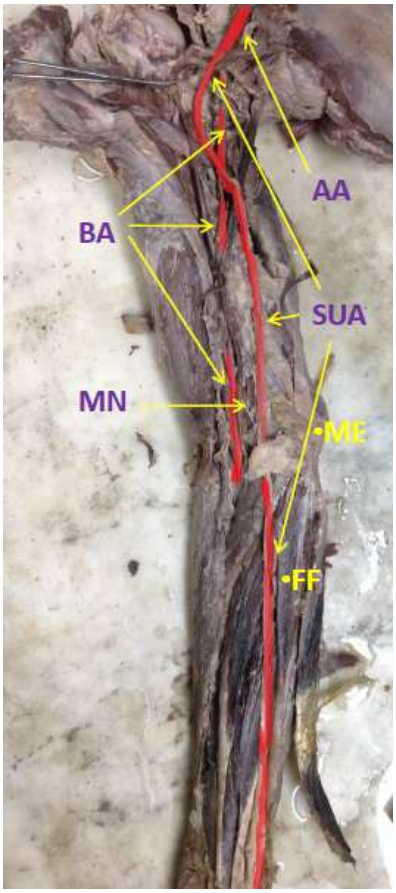

Fig-3: High origin of ulnar artery taking origin from axillary artery

(BA- Brachial Artery, AA- Axillary Artery, UA- Ulnar Artery, SUA- Superficial Ulnar Artery, MN- Median Nerve, RA- Radial Artery, PTDH- Pronator Teres Deep Head, OP- Olecranon Process)

DISCUSSION

In the present study in 96% of the specimens the ulnar artery arises from the brachial artery as a terminal branch at the level of neck of radius (Fig-1).

High origin of ulnar artery

McCormack *et al*., [5] in the 750 upper extremities studied, they found a high origin of ulnar artery in 17 cases. It accounts to about 2.26%. The present study shows high origin of ulnar artery in 4%.

High origin of ulnar artery from brachial artery

R. Quain [7] stated that among high origins, the origin of ulnar artery from brachial artery is more than its origin from the axillary artery. In the present study among high origins, the origin of ulnar artery from brachial artery is 2% (Fig-2) and from the axillary artery is 2%. Karlson and Niechajev [4] studied the ulnar artery and found its high origin from the brachial artery in 0.43%.

High origin of ulnar artery from axillary artery

In the present study among high origins, the origin of ulnar artery from axillary artery is 2% and it runs superficial to the flexor muscles and deep to deep fascia as superficial ulnar artery (Fig-3).

The reported incidence of ulnar artery originating from axillary artery is given in the table below.

Study	Sample	Incidence	Percentage
Gruber (1867) [2]	700	4	0.57
Muller (1903) [6]	100	1	1
Adachi (1928) [1]	1198	2	0.17
Hazlett (1949) [2]	188	3	1.6
Mccormack *et al*., (1953) [5]	750	7	0.93
Rodriguz *et al*., (2001) [8]	384	4	1.04
Present study (2018)	50	1	2

CONCLUSION

The ulnar artery arises as the terminal branch of brachial artery at a level of the neck of the radius in significant proportion. The ulnar artery may arise proximal to the elbow or high up in the axilla.

REFERENCES

1. Adachi, B. (1928). Das Arterien System der Japaner. Kyoto, Maruzen, 1: 285-356.
2. Gruber, W. (1867). Archiv fur Anatomie. Physiologie und Wissenschaftliche Medizin, 668-687.
3. Hazlett, J. W. (1949). The superficial ulnar artery. *Canadian Medical Association Journal*, *61*(3), 289-293.
4. Karlsson, S., & Niechajev, I. A. (1982). Arterial anatomy of the upper extremity. *Acta Radiologica. Diagnosis*, *23*(2), 115-121.
5. McCormack, L. J. (1953). Brachial and antebrachial arterial patterns. *Surg Gynecol Obstet*, *96*, 43-54.
6. Muller, E. (1903). Beitrage zur Morphologie des Gefassystems. I. Die Armarterien des Menschen. *Anatomische Hefte*, 22: 377-575.
7. Quain, R. (1844). The anatomy of the arteries of the human body. *Taylor and Walton*.
8. Rodríguez-Niedenführ, M., Vazquez, T., Nearn, L., Ferreira, B., Parkin, I., & Sanudo, J. R. (2001). Variations of the arterial pattern in the upper limb revisited: a morphological and statistical study, with a review of the literature. *The Journal of Anatomy*, *199*(5), 547-566.