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## UNILATERAL HIGHER TRIFURCATION OF BRACHIAL ARTERY- A CASE REPORT

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### ABSTRACT

**Introduction:** The brachial artery is the principal artery of the arm. Variations in course and branching patterns of brachial artery are important for physicians, plastic and vascular surgeons and radiologists.

**Case Report:** In the present case, unilateral trifurcation of brachial artery into radial, ulnar and superior ulnar collateral artery was observed in the right upper limb of an adult female cadaver.

**Conclusion:** Our case appears to be unique in that the brachial artery was trifurcating at a higher level into ulnar, radial and superior ulnar collateral arteries. Health specialists must be aware of the possible variations of the brachial artery as it has several clinical applications.

**Keywords:** Trifurcation, Brachial artery, Superior ulnar collateral artery.

### INTRODUCTION

Arteries are muscular and or elastic cylindrical tubes that conduct blood away from the heart. Arteries emit terminal and collateral branches. Terminal branches appear when the main artery divides and no longer exists, for instance, as the brachial artery divides into the radial and ulnar arteries. Collateral branches occur when the main artery gives off other vessels but still continues ahead as the same vessel<sup>1</sup>.

The brachial artery is the principal artery of the arm. It is a continuation of the axillary artery, begins at the distal (inferior) border of the tendon of teres major and ends about a centimetre distal to the elbow joint (at the level of the neck of the radius) by dividing into radial and ulnar arteries<sup>2</sup>. At first it lies medial to the humerus, but gradually spirals anterior to it until it lies midway between humeral epicondyles. It is superficial in its course and is related to important nerves; median, ulnar and radial nerves<sup>3</sup>. Collateral branches of brachial artery are profunda brachii, nutrient, superior, middle and inferior ulnar collateral, deltoid and

muscular arteries. Radial and ulnar arteries are the terminal branches.

One of the several clinical applications of the brachial artery, besides blood pressure monitoring and arterial puncture for gasometry, is the measure of its flow mediated dilation (FMD). Another invasive procedure using brachial artery is ventriculography, when femoral access is not possible<sup>1</sup>. Hence, the awareness of the variations in course and branching patterns of brachial artery are important for physicians, plastic and vascular surgeons and radiologists.

### CASE REPORT

Unilateral trifurcation of brachial artery was observed during routine dissection of an adult female cadaver in the dissection hall of anatomy department, Shri B M Patil Medical College, Bijapur. In this case it was observed that in the right upper limb the brachial artery divided into radial, ulnar and superior ulnar collateral artery in the middle third of the arm. The part of the brachial artery proximal to this division gave

origin to the profunda brachii artery and the branches to the neighbouring muscles. The radial artery so formed had a superficial course in the arm and crossed the median nerve few centimetres below its formation to the lateral side of arm. It then entered the cubital fossa and ran deep to the brachioradialis where it gave off the radial recurrent artery before continuing into the forearm.

The main trunk of brachial artery continued down superficially as the ulnar artery and was crossed by the median nerve from lateral to medial side in the

arm just before entering the cubital fossa. The inferior ulnar collateral artery began 4 cm proximal to the elbow from this ulnar artery. In the cubital fossa it was deep to the deep head of pronator teres and gave off the common interosseous artery and continued into the forearm. The superior ulnar collateral artery normally arises a little distal to the mid-level of the upper arm from the brachial artery. But in our case it began at a little higher level along with the ulnar and radial artery. It accompanied the ulnar nerve and had a normal course in the arm.



### Trifurcation of Brachial Artery

1) Brachial artery 2) Radial artery 3) Ulnar artery 4) Superior ulnar collateral artery 5) Median nerve 6) Ulnar nerve.

### DISCUSSION

Variations in the arterial patterns of upper limb in adult human body have been frequently observed either in routine dissections or in clinical practice<sup>4</sup> and have been reported by several authors. Our case appears to be unique in that the brachial artery was trifurcating at a higher level into ulnar, radial and superior ulnar collateral arteries whereas the cases reported earlier are mostly

related with higher bifurcation of brachial artery into radial and ulnar artery or trifurcation of brachial artery into ulnar, radial and radial recurrent or common interosseous artery.

In 2012 Shewale SN *et al* reported a case of unilateral bifurcation of brachial artery at its commencement into radial and ulnar artery in a male cadaver<sup>5</sup>.

In 2011C K Reddy et al reported bilateral trifurcation of brachial artery in an adult female cadaver into radial, ulnar and common interosseous artery near the neck of the radius<sup>6</sup>.

In 2010 Harbans Singh et al reported a case of higher bifurcation of brachial artery 7.5 cm above the cubital fossa with superficial course of radial artery in forearm in the right upper limb of an adult male cadaver<sup>4</sup>.

In 2002 Patnaik et stated that there were 26% variations in the branching pattern of brachial artery in a study done on 50 upper limbs but only one case of trifurcation of brachial artery was reported<sup>7</sup>.

In 2001 Patnaik et al reported a case of unilateral trifurcation of brachial artery in a male cadaver into radial, ulnar and radial recurrent artery near the neck of radius<sup>8</sup>.

## CONCLUSION

Anatomical variations are quite common, due to the several influences during human body formation. Health specialists must be aware of the possible variations of the brachial artery.

- The present variation may cause difficulties in recording blood pressure.
- These arteries may be injured during orthopaedic and plastic surgeries.
- Being superficial, (i) they may be mistaken for a vein and (ii) are more susceptible to trauma and thus bleeding.

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