



A Cadaveric Study Of High Bifurcation Of Brachial Artery

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Abstract

The brachial artery, which continues in the axillary artery, is a vital blood vessel in the upper arm. It is necessary to supply oxygen-rich blood to the arm and forearm. Beginning at the lower border of the teres major muscle, the brachial artery travels distally down the medial surface of the humerus before dividing into the radial and ulnar arteries near the cubital fossa. Because of its physical placement, the artery is crucial for several clinical procedures, such as blood pressure monitoring and venipuncture. Its importance includes understanding traumatic injuries, vascular diseases, and upper limb surgery. Medical professionals need to understand the anatomical landmarks and variations of the brachial artery in order to ensure accurate diagnosis and effective treatment approaches.

Understanding its physiological function and pathological conditions can enhance clinical outcomes in cardiology, surgery, and emergency medicine.

Keywords: brachial artery, ulnar artery, venipuncture, cubital fossa, pulse, blood pressure, median nerve, axillary artery, teres major muscle, higher bifurcation, radial artery,

Introduction

The brachial artery is one of the primary blood vessels that supplies blood to the hand and arm. It is an extension of the axillary artery that runs down the upper arm from the bottom margin of the teres major muscle. The artery descends along the medial portion of the arm into the bicipital groove, which is deeper than the biceps brachii muscle. The radial and ulnar arteries, which divide at the elbow at the level of the radius's neck, provide blood to the hand and forearm.

The brachial artery releases the muscular branches and humeral nutritional artery as it travels. The deep brachial artery leaves the brachial artery's back, descends, and runs via the radial humeral groove along the radial nerve. Before dividing into the middle and radial collateral arteries, which aid in the formation of the anastomosis around the elbow joint, it supplies blood to the triceps. Both the superior ulnar collateral artery and the ulnar nerve, which both anastomoses in the vascular network of the elbow, go from the middle of the arm to the posterior part of the medial epicondyle.

The inferior ulnar collateral branch is part of the arterial anastomosis of the elbow joint. It begins above the elbow and extends medially to the medial epicondyle. The brachial artery is extensively used in many medical procedures, such as coronary artery approaches, endovascular treatments, peripheral vascular procedures, and vascular shunts for hemodialysate. The brachial artery is easily accessible due to its covering by skin and superficial and deep fasciae. The bicipital aponeurosis crosses it close to the elbow, anteriorly separating it from the median antecubital vein.

The median nerve crosses the artery from the lateral to the medial side near the middle of the arm at the distal junction of the coracobrachialis. Blood pressure can be monitored in the middle third of the arm before the radial and ulnar arteries separate since the brachial artery pulse is easily detectable there.

Case report

When a 55-year-old male cadaver was routinely dissected, the brachial artery was found to bifurcate at an abnormally high height, around 15 cm above the cubital fossa. Figure 1 illustrates how the brachial artery splits into the superficial brachioradial artery (brachioradial artery) and the brachial artery, which are situated around 15 cm above the cubital fossa and 9 cm below the lower border of the teres major.

The primary brachial artery travels deep and medial to the median nerve in the middle of the arm, while the brachioradial artery flows superficially and medially to the median nerve. The superficial brachioradial artery continues to ascend, passing over the median nerve in the lower portion of the arm before ending laterally in the cubital fossa. The brachial artery runs lateral to the median nerve in the cubital fossa after running deep and below to the median nerve in the lower arm.

As seen in figure 1, the radial artery traveled superficially over the anterior side of the forearm, resting above the muscle fascia but beneath the skin. The vascular pathway was meticulously traced and measured in order to establish this variance.

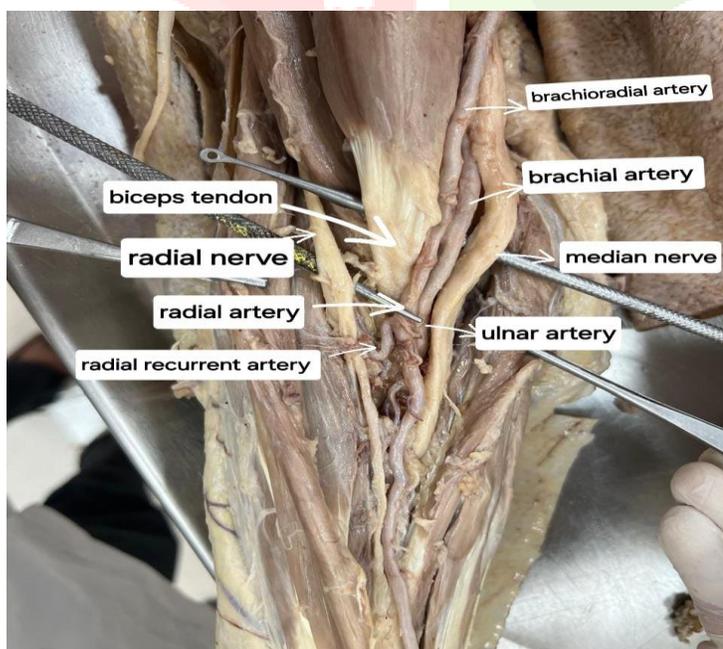


Figure 1: Anterior view of Axilla- black encircled area shows highly bifurcated Brachial Artery, course of Brachial Artery (BA), Brachioradial Artery (BRA), Median Nerve (MN), Radial Artery (RA).

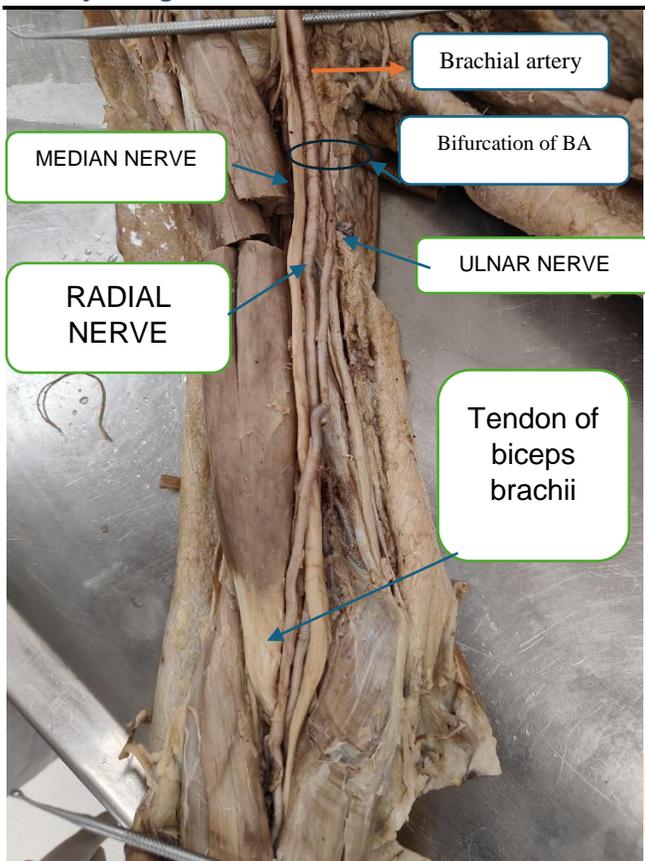


FIGURE 2. Anterior view of Axilla- figure demonstrates contents of cubital fossa viz Brachial Artery (BA), Brachioradialartery (BRA), Medial Nerve (MN), Radial Artery, tendon of Biceps Brachii, Radial Recurrent Artery, Radial nerve

RESULT:

In the area of the elbow, the brachial artery usually splits into the radial and ulnar arteries. Higher bifurcation, in which the brachial artery splits at a position closer than typical, might, nevertheless, have serious clinical ramifications.

Anatomical changes, whether inherited or the consequence of developmental processes, may lead to higher bifurcation. Medical practitioners must be aware of these differences, particularly in specialties such as interventional radiology, trauma surgery, and vascular surgery. These differences may have an impact on imaging study interpretation, catheter placement, and surgical techniques.

In clinical practice, a greater bifurcation may raise the risk of vascular problems during upper limb treatments, including hand or forearm surgeries. Additionally, it might affect collateral circulation, which would affect hand and forearm perfusion. Understanding these anatomical variances can help improve the planning and execution of surgical procedures in patients with vascular illnesses or accidents.

Additionally, some demographic characteristics, such as age, sex, and ethnicity, have been connected to differences in brachial artery bifurcation. This variance emphasizes the need of customized patient evaluations and the necessity of thorough anatomical research in order to enhance patient outcomes.

Discussion and conclusion

The upper bifurcation of the brachial artery presents important challenges for both clinical practice and anatomical study. Understanding these differences is essential for lowering surgical risks, enhancing intervention strategies, and enhancing overall management of vascular diseases in the upper extremities. Further research and detailed anatomical mapping are needed to better understand the implications of higher bifurcation and ultimately enhance

surgical techniques and patient care. The outcomes of upper limb surgeries and procedures can be significantly enhanced if medical professionals have a better awareness of these anatomical variations.

CLINICAL SIGNIFICANCE:

Blood Pressure Measurement: This widely used technique provides vital information regarding cardiovascular health by taking an arm blood pressure reading.

Pulse Assessment: The brachial pulse is easily palpable, which aids in determining circulation and identifying any vascular problems.

Vascular Access: In some medical operations, the artery serves as a location for catheterization or is frequently utilized for procedures such as arterial blood gas sampling.

Surgical Considerations: To avoid complications like ischemia or bleeding, it is essential to understand the architecture of the brachial artery during upper limb procedures.

Peripheral Vascular Disease: Disorders that impact the brachial artery may be a sign of systemic vascular problems, such as atherosclerosis, which can also impact other parts of the body.

Collateral circulation: Its function in the blood supply of the upper limbs is crucial for comprehending and treating disorders that impact limb perfusion.

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