

Case Report

A CASE REPORT ON HIGH ORIGIN OF RADIAL ARTERY

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ABSTRACT

Background: The use of radial artery (RA) as an access to heart and for other procedures and surgeries make it significant.

The context and purpose: The RA is a common access port for coronary angiography (CAG), percutaneous coronary intervention (PCI), and coronary artery bypass graft Surgery (CABG), RA cannulation, along with others.

Results: In this case report, we want to present a case of unilateral high origin of RA arising as branch of brachial artery in the proximal 1/3rd of arm.

Conclusions, brief summary and potential implications: Misdiagnosis, complications during medical procedures and increased possibility of injury are the most common dangers of having a superficial RA.

KEYWORDS: Coronary artery, High origin, Radial Artery (RA).

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INTRODUCTION

The literature has evidence of similar variation reported as early as 1600. Still we report a case of unilateral high origin of RA for the reason that its frequency of occurrence makes it noteworthy. The clinical implications of variation in origin and course of RA are of concern to clinicians, cardiologist and cardiothoracic surgeons, and in particular to vascular and plastic surgeons. It can lead to not just mistaken radiological diagnosis and anaesthetic application, complications in trauma surgeries, heavy bleeding in the least expected situations not only during medical intervention but even in common day today

personal activities [1].

It is the most common variation of all the vascular anomalies in upper extremity. Variation in the origin and course of RA is reported as high as 15.6% in a study conducted on Cadavers (249) & Embryos (159) by Weatherby et al in 1956 [2]. It is reported 24.4% in the angiographic images studied by Janevski et al in 1982 [3].

METHODS

During routine dissection of upper extremity at the Department of Anatomy, Grant Medical College, Mumbai, a RA was dissected showing high origin in proximal 1/3rd of arm. The variation was noted in right upper limb of male cadaver,

whose approximate age was 60 years. The variation was unilateral. The RA in left arm had origin at lower part of cubital fossa with usual course.

The dissection was done as per Cunningham's Dissection Manual Vol.1. The procedures followed were in accordance with ethical standards of handling of cadaver for learning and teaching.

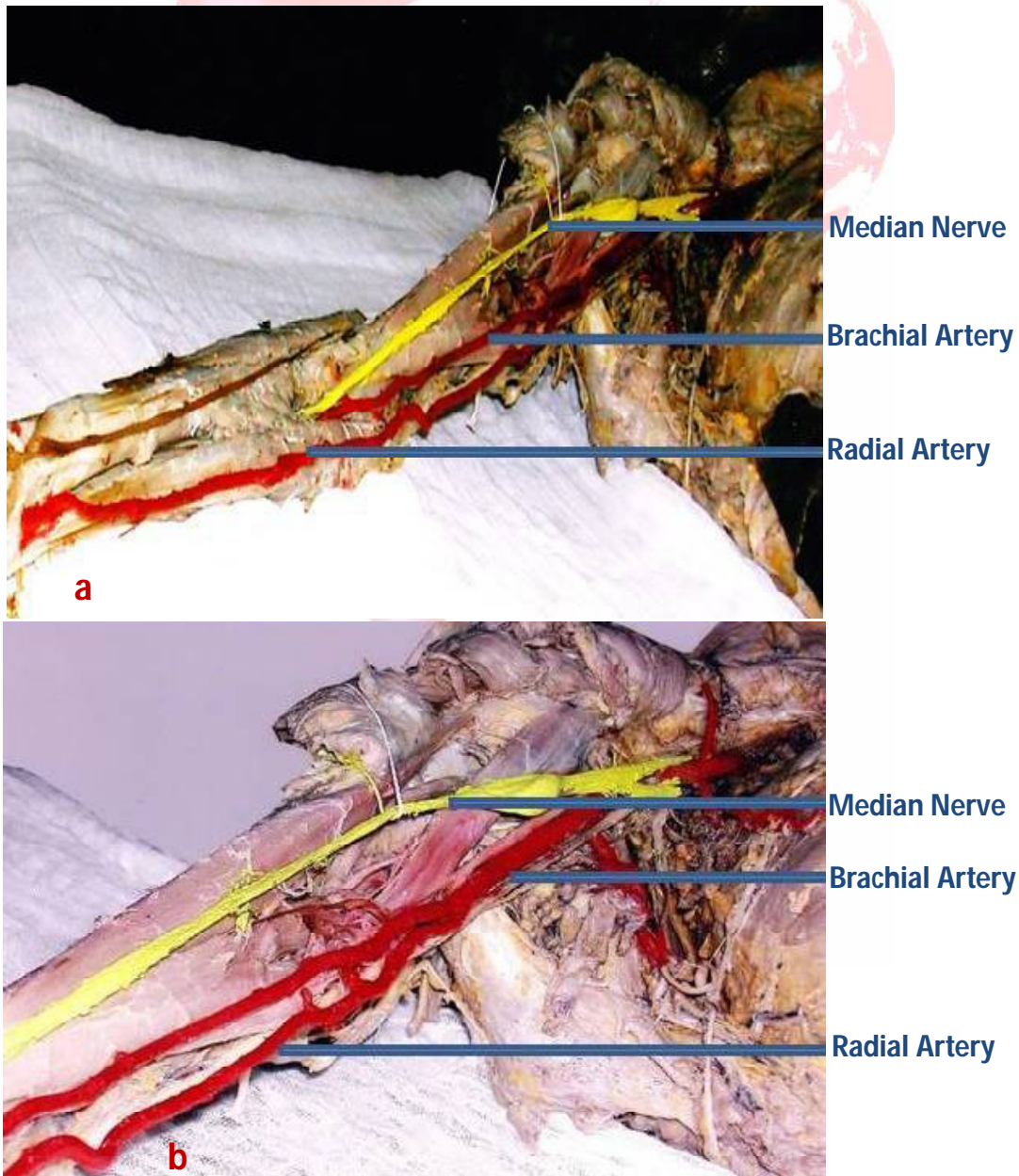
RESULTS

The normal RA was absent. The RA was a branch of brachial artery in the proximal 1/3rd of the arm. The course of RA was superficial throughout its course in the arm and forearm. It was positioned superficial to muscles of flexor compartment,

covered by deep fascia and skin. Radial recurrent artery was absent in the present case. There were no muscular branches in the forearm. The course and branches in the palm were as usual. There was no communication of the artery with others till it reached the palm. In the palm the artery followed the usual course contributing to the superficial palmar arch and continued further as deep palmar arch. (Fig.1)

No muscular or other arterial variations were observed in this cadaver. The course of RA was superficial to flexors of forearm but deep to deep fascia. It may be subcutaneous where RA runs on the deep fascia [4].

Fig. 1 a & b: High Origin of Superficial Radial Artery.



DISCUSSION

Embryo logically, at Stage 18 high origin is established for RA. Different reasons that are sought after are differentiated hemodynamic predominance of the deep arterial segments over the superficial arterial network, chemical factors, foetal position in the uterus, and developmental arrest at early stages and genetic predisposition [5]. The exact embryological interpretation of this variation is difficult. It may arise as a result of modifications to the normal pattern of capillary vessel maintenance and regression.

As per anatomy books, RA is one of the terminal branch of brachial artery at the level of neck of radius along with ulnar artery. In the cubital fossa, it passes downward and laterally resting on the tendon of biceps brachii, supinator and pronator teres. Here it gives its first branch, radial recurrent artery. Then it descends in the forearm supplying muscular branches to the flexor muscles. Then it is palpable at the anterior surface of lower end of radius. The artery course dorsally to become a content of anatomical sniff-box. In the palm it completes the superficial palmar arch laterally by arteria princeps pollicis or arteria radialis indicis branch. The RA itself continue at proximal intermetacarpal space, between two heads of first dorsal interosseous muscle to form deep palmar arch with deep branch of ulnar artery [6].

RA is useful for by-pass graft harvesting for coronary vasospasm. As compared to femoral, RA is a preferred port for coronary interventions. This makes it paramount to be alert on the possibility of vascular anomaly. A routine use of a pre-procedure arm angiogram prior to catheter advancement to identify anatomical variants is mandatory; especially so if there is resistance to either guide wire or the catheter. Inappropriate cannulation can result in dissection and rupture. RA has evidence of superior peri and post operative outcome than the saphenous vein grafts [7].

The clinical encounters include RA forearm flap (arterial or pedical graft), used to get the skin flap from forearm in reconstruction surgeries [8, 9]. RA is suitable site for arterial cannulation. Superficial course of RA can be mistaken for

peripheral vein. It can lead to accidental injection of drugs in it due to resemblance to position of vein. This can lead to tissue gangrene and amputation. The hazard of intra-arterial injection is preventable [10].

The erroneous ligation of RA instead of vein in cubital fossa is likely in the cubital fossa [1].

Median nerve compression can occur due to its relation to variant RA and can be mistaken with radiculopathy and neuropathies. Radiologic misinterpretation of a variant RA can lead to mismanagement. The ultrasonography (USG) and angiography are used to affirm the variation prior to procedure or operation [11]. In Orthopaedics the cases of supracondylar fracture of humerus and dislocation of head of humerus will involve RA. Complications due to involvement of RA are documented where the vascular surgery will be essential apart from treatment of the fracture itself [12].

The other variations known of the origin and course of RA are:

The absence of RA is documented in the literature [13]. The RA may arise as a branch of axillary artery [14] or thoraco acromial trunk [15]. The RA may not take part in the formation of superficial palmar arch [16].

Use of RA for the cardiac procedures makes its variations important. Even a physician treating simple ailments of cough and cold always palpate for RA on lateral side of wrist.

CONCLUSION

The RA assessment prior to procedure or at least when obstruction is felt is mandatory since the likelihood of such variation high [17].

List of Abbreviations:

Radial Artery -RA

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Conflicts of Interests: None

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