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VARIATION OF SUPER FACIAL PALMAR ARCH

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ABSTRACT

Introduction: Palmar arch is an arterial arch in the palm formed by Branches of terminal part of ulnar and radial arteries. In more than 95 percent case found the complete palmar arch is found but in $5 \leq$ Percent cases ulnar artery fail to complete the arch. **Method:** In routine Post Graduate Dissection of 48 year old male formalin fixed cadaver with unknown history in J.S. Ayurveda Mahavidhyalaya, Nadiad, Gujarat, India, a variation in the right superficial plamar arch was found. The dissection carried out by following a cunighams manual of practical anatomy. **Result:** There are five types of incomplete palmer arch have been identified. In the present study we observed an incomplete arch belonging to the type B variation of superficial palmer arches of coleman and ansons classification. **Conclusion:** Anatomical Knowledge of Variation of superficial palmer arch is most necessary for hand surgery as well as myocardial revascularization

KEYWORD: Superficial palmar arch, variation, branches.

INTRODUCTION

Superficial palmar arch is an arterial arcade which is dominant vascular structure of palmar, it is also known as volar arch or ulnar arch or arcus palmaris or arcus volaris.

The convexity of the arch is directed towards the fingers, and its most distal point is situated at the level of the distal border of the fully extended thumb. The Superficial palmar arches plays important role in blood supply of the hand. Knowledge of various pattern, size and diameter of the palmar arch is necessary for surgeon for reconstructive surgery of the hand, it is also important during the harvesting for the myocardial revascularization and grafting. Various surgical procedures may produce ischemia of the hand due to absence of collateral circulation from palmar artery[1.]

Allen's test and Doppler ultra sound can be done to assess blood circulation. But they are not reliable method for every case. So anatomical knowledge of course and caliber of branches of palmar arch is necessary in surgical procedure of hand and harvesting of vessels.

MATERIAL

Following instrument were used for dissection.
- Scalpel
- Blunt forceps, pointed forceps and toothed forceps
- Straight scissors and curved scissors
- Marker pen
- Cotton

A CASE REPORT

In routine Post Graduate Dissection of 48 year old male formalin fixed cadaver with unknown history in J.S. Ayurveda Mahavidhyalaya, Nadiad, and Gujarat, India. a variation in the right superficial plamar arch was found. The dissection carried out by following the cunighams manual of practical anatomy. The skin was incised, palmar apponeurosis and Flexor retinaculum were reflected, and the variation of superficial plamar arch was identified.

The superficial palmar arch given three digital branches which supply two and half fingers. Lateral two fingers received their supply from radial artery (fig.1). The lateral half of middle finger was found receiving blood supply from the palmar metacarpal branch of deep palmar arch (fing.2).
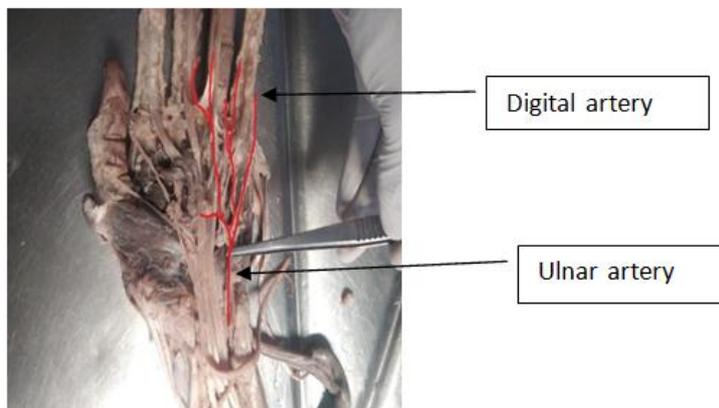
The superficial palmar arch was not completed as there was no anastomosis between radial and ulnar artery (fig.3).
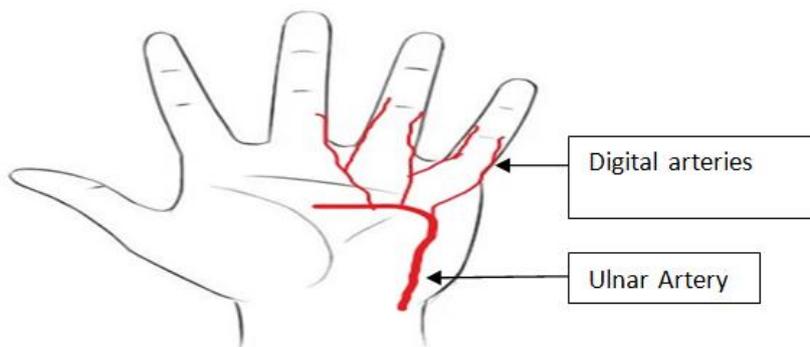
Incomplete superficial palmar arch (fig.1)
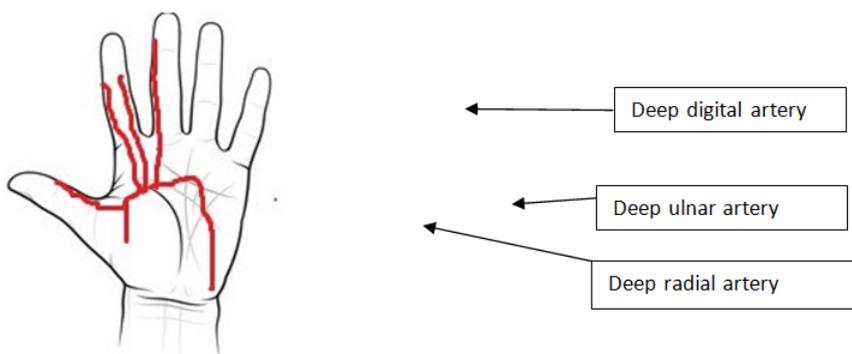
Deep complete plamar arch (Fig.2)

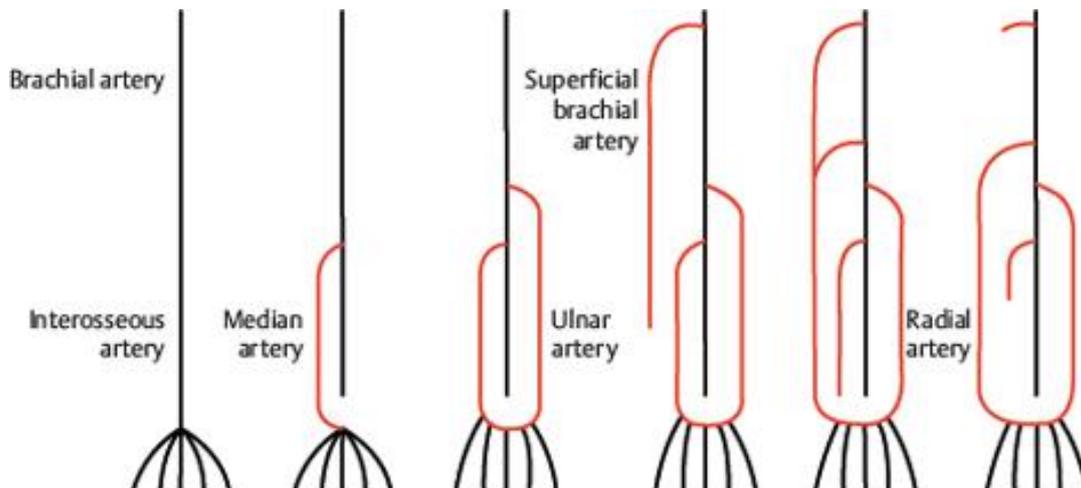

Incomplete superficial palmar arch (FIG.3)

DISCUSSION

The arterial system develops from a multiple and a plexiform source, by sequential pattern of development, and functional dominance followed by regression of some path. Developmentally lateral branch of seventh intersegmental artery communicates with axis artery developing in situ in upper limb bud. This axis artery is represented by axillary, brachial, and interosseous arteries. The interosseous artery continues into hand plexus, and forms deep palmer arch. The ulnar, median, and radial arteries sprout from axial artery. Median

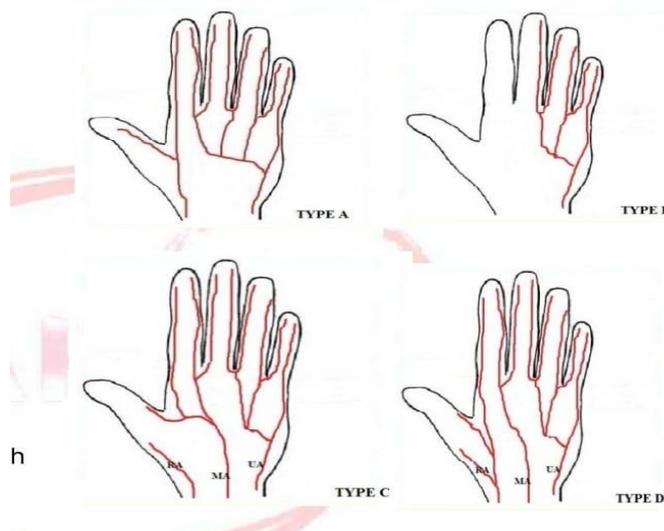arteries that sprout from axis artery usually accompany median nerve in hand and forms superficial capillary plexus Median artery regresses, loses its distal connection and superficial palmar plexus is fed by communication of the ulnar artery which the plexus to form the arch.[2]

The branch of superficial ulnar and radial arteries anastomosis and forms the superficial palmar arch. In the absence of the radial or median artery the ulnar artery form a complete arch and supplies all fingers and thumb. The research was conduct by Dr. Pooja dawani Anita mahajan et al, and observed that in 96.7% cases superficial plamar arch anastomose, where as in 3.3% case the superficial palmar arch do not anastomose.[3]

The superficial palmar arch of the hand have many various pattern. In 1961 coleman and anson studied these diver ties and classified in to five group.[4] Presently anatomist commonly classified superficial palmar arch in to four group namely type A, type B, type C, type D, In Type A there is not anastomosis between superficial branch of radial artery and ulnar artery, In Type B superficial palmar arch formed by superficial branch of ulnar artery, In type C Superficial Palmar arch formed by ulnar and median arteries without anastomosis. In Type D all the digital artery arise from ulnar, median and radial arteries without any anastomosis between them (fig.3).

In our study we observed an incomplete arch belonging to the type B variation of superficial palmer arches of coleman and ansons classification.In European country janevs found incomplete palmar arch in 25% cases among 500 hand dissected.[3] According "traditional classification" 96.4% complete plamar arch and 3.6% incomplete plamar arch were found by the Ikeda et al.[5] Loukas et al observed the 90%complete arch and 10%

incomplete arch.[6] Chandani gupta observed 77.3% complete arch and 22.6% incomplete arch.[7]

Clinical significance
For the orthopedic surgeon as well as microvescular surgeon arterial arches of the hand are very important while doing the surgeries of the hand. The latest reports on CABG(coronary artery bypass graft) favor the use of an arterial graft, in particular the radial artery, and show

benefits over the use of some other frequently selected vessels such as the saphenous vein.[8] The greatest risk associate with harvesting the radial artery for coronary bypass grafting is ischemia of the soft tissue of the hand. There may be variation of the in the formation of these arterial arches which may complicate the surgical procedure.

CONCLUSION

Anatomical Knowledge of Variation of superficial palmer arch is most necessary for hand surgery as well as myocardial revascularization. In case of absence of anastomosis, the surgeon must avoid the radial artery for revascularization as it may result ischemia of hand .Surgeon must be ruled out the possible incomplete plamar arch before radial artery grafting.

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