ABSTRACT

The superficial palmar arch and its contributing arteries are highly variable. In this present case, we found the following variations: (a) Persistence of median artery which is contributing in the completion of superficial palmar arch. (b) Existence of 4 common palmar digital branches. 1st common palmar digital artery is supplying the ulnar side of the thumb and radial side of index finger by dividing into proper palmar digital branches. (c) Absence of proper palmar digital branch to the ulnar side of fifth finger. The knowledge of frequency of anatomical variations of arterial pattern of hand is very important for safe and successful hand surgeries.

KEY WORDS: Median artery, Ulnar artery, Common palmar digital artery, Mediano-ulnar arch.

Introduction

The superficial palmar arch, a dominant vascular structure of the hand, is localized just deep to the palmar aponeurosis[1]. This arterial arch is variable. Normally, it begins as terminal branch of the ulnar artery on the flexor retinaculum distal to the pisiform bone. It then crosses the hook of the hamate bone and turns laterally deep to the palmar aponeurosis to join one or other of the branches of the radial artery [2].

It gives off four palmar digital arteries; the medial most supplies the medial side of the little finger and is called the proper palmar digital artery. The other three are common palmar digital arteries which pass to the medial three interdigital clefts [3]. Although the radial and ulnar arteries provide most of the blood supply of the hand, additional circulation may come from the median artery or the interosseous arterial system [4].

Case Report

During routine dissection of a formalin fixed adult male cadaver for medical students in Rama Medical College, Kanpur a variation of superficial palmar arch was found. The dissection was carried out carefully according to Cunningham’s manual; the formation
of superficial palmar arch is observed and recorded.

It was observed that, in the left upper limb, the superficial palmar arch was formed by superficial palmar branch of ulnar artery but it was completed by the median artery. The median artery was arising from the anterior interosseus artery. It passed deep into the flexor digitorum superficialis, accompanying the median nerve medially, and passed deep to the flexor retinaculum and palmar aponeurosis to complete the superficial palmar arch by anastomosing with the superficial palmar branch of ulnar artery. As such there was no anomalous course and branching pattern of the median nerve. The arch was giving four common palmar digital branches which were passing towards the corresponding four web spaces and dividing into proper palmar digital branches to supply the contiguous sides of the corresponding fingers.

The first common palmar digital branch, after reaching the first web space divided into proper palmar digital branches to supply the ulnar side of the thumb and radial side of the index finger. However, the second one, after reaching the second web space, supplied the ulnar side of the index finger and radial side of the middle finger by dividing into proper palmar digital branches.

The third common palmar digital branch reached the third web space and supplied the ulnar side of the middle finger and radial side of the ring finger while the fourth one reaches the fourth web space and supplying the ulnar side of the ring finger and radial side of the little finger by dividing into proper palmar digital branches.

It was observed that, there was absence of proper palmar digital branch from superficial palmar arch to supply the ulnar side of the little finger.

We found that, the princeps pollicis artery to supplied the radial side of thumb.

**Discussion**

A classical superficial palmar arch an anastomosis along the palmar aspect, fed by direct continuity between the ulnar artery and the superficial palmar branch of radial artery [5]. In the present case, the median artery (arteria nervi mediana) & contributed to the formation of superficial palmar arch.

Colemen and Anson, classified the superficial palmar arch as group (I) complete arch and Group (II) incomplete arch. The present case belonged to group (I) and type C (mediano-ulnar arch) [6].

According to Rodriguez-Niedenfuhr et al the median artery may persist in adult life in two different patterns: palmar type and antebrachial type. The palmar type represents the embryonic pattern and is large long and reaches the palm whereas antebrachial type which represents a partial regression of embryonic artery is slender short and terminates before reaching the wrist [7]. In the present case, median artery was palmar type.

According to Balakrishnan et al., The median artery takes its origin from common interosseus, anterior interosseus and ulnar artery [8]. Acarturk et al found that, the median artery arising from the radial artery [9]. In the present case, median artery was arising from anterior interosseus artery which coincided with the study of Balakrishnan et al.

According to Coleman and Anson 1961, the common palmar digital arteries were recorded to have 7 different patterns which applied to the present case and it was noted to be of type 1. This type showed that the 1st common palmar digital artery which supplied the ulnar side of the thumb and radial side of the index finger. The rest 3 common palmar digital arteries supplied 2nd, 3rd and 4th inter-spaces [6]. Ikeda et al also described the artery arising
from the superficial palmar arch to supply the
first web space as the first common palmar
digital artery [10].

coronary artery bypass graft (CABG) favor
the use of an arterial graft, in particular the
radial artery as compared to saphenous vein.
The radial artery contributes greatly to the
circulation of the hand but in many cases it
can be removed as a non-essential vessel, with
adequate circulation being provided by the
remaining ulnar and in some cases persistent
median artery.

**Fig.No.1:** SPA- Superficial palmar arch; MA:
Median artery; UA: Ulnar artery; MN:
Median nerve

**Fig.No.2:** SPA- Superficial palmar arch; MA:
Median artery; UA: Ulnar artery

**Conclusion**

Presence of the median artery is important
as it may be involved in the carpal tunnel
syndrome, pronator teres syndrome and
anterior interosseous syndrome. In considering
radial artery harvesting for coronary artery
bypass graft (CABG) the least number of
complications may be expected when the
median artery forms the superficial palmar
arch with ulnar artery. Precise knowledge on
the branching pattern of the arch provides
valuable source of information to the vascular
surgeon.

1: First common palmar digital artery
2: Second common palmar digital artery
3: Third common palmar digital artery
4: Fourth common palmar digital artery

**References**

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