Double superficial palmar arch - a case report

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Abstract

The superficial palmar arch is formed predominantly by the ulnar artery with a contribution from the superficial palmar branch of the radial artery. However, the arch formation is highly variable. The knowledge of the relationship, course and variations of the arch are important in various surgical procedures. Incomplete ligation of vessels in cases of variable arterial arch can lead to serious secondary hemorrhage in the depth of the wounds of hand. In the present study, a case of double superficial palmar arch is reported in the right hand of a male cadaver. The radio-ulnar type of arch had a proximal and a distal part from where the common palmar digital arteries arose.

Key words: double superficial palmar arch, radio-ulnar, palmar digital artery.

Introduction

The superficial palmar arch is formed predominantly by the ulnar artery and is completed in one third of the instances by the superficial branch of radial artery (radio-ulnar type), in a further one third of the cases by the arteria radialis indicis or by the median artery (mediano-ulnar type) and the rest by the ulnar artery alone (ulnar type)1,2,3. The arch formation is highly variable regarding the size of the arteries that make it up and due to the existence of branches coming from other arteries and adding up as tributary to it4. Understanding the variations of superficial palmar arch is important in microvascular repair and re-implantation5. Wounds of palmar arch can be troublesome as even after ligation of both ulnar and radial artery, there can be recurrent hemorrhage due to free anastomosis between the palmar carpal arches and interosseous vessels6,7. The knowledge regarding the variable pattern of superficial palmar arch is therefore important to ensure complete ligation of vessels in surgical procedures of hand.

Case Report

A case of double superficial palmar arch was found in the right hand of a male cadaver during dissection in the department of Anatomy at Gian Sagar Medical College. The arch was formed by the ulnar artery and completed by the superficial branch of radial artery. The double superficial palmar arch had a proximal and a

\[\text{Fig. 1. Proximal part of superficial palmar arch (PROXIMAL SPA)}\]
\[\text{Distal part of superficial palmar arch (DISTAL SPA); Ulnar artery (UA); Radial artery (RA); Superficial branch of radial artery (sup branch of RA); Common palmar digital artery (CPDA); Proper palmar digital artery (PPDA).}\]
distal part. Both, the proximal and distal parts of the arterial arch were complete. The two lateral common palmar digital arteries arose from the distal part of the arch while the medial common palmar digital artery arose from the proximal part of the arterial arch. (Fig 1)

Discussion

A case of double superficial palmar arch of the radio-ulnar type having complete proximal and distal parts is presented here. Previously Patnaik and Singla4 have reported a double superficial palmar arch of mediano-ulnar type with complete proximal and incomplete distal part. Another case of mediano-ulnar type has been reported by Jyoti 9.

The explanations for the arterial variations are based on classical outline of arterial development10. Arey11 is of the view that the anomalies of blood vessels may be due to the choice of unusual paths in the primitive vascular plexuses, the persistence of vessels normally obliterated, the disappearance of vessels normally retained, incomplete development or fusion and absorption of the parts usually distinct.

The relationship, courses and variations of major arteries is of surgical importance in the conduct of reparative surgery in the arm, forearm and hands12, 13. Extensive arterial anastomosis in hands leads to profuse bleeding from its wounds14. A serious secondary hemorrhage can occur in the depths of a wound when the operator has successfully identified and ligated only those vessels which are normally encountered in the area12.

Conclusion

The superficial and deep palmar arches account for a rich anastomosis between arteries of the palm. Wounds of the palm bleed profusely but heal rapidly because of this anastomosis. In cases of grafting of radial artery in the hand surgery, plastic surgery of hand and reconstruction in acute trauma of hand, the vessels need to be ligated to arrest bleeding. Variation of the arterial arches can result in incomplete ligation and secondary hemorrhage from the wounds. The anatomic knowledge of the variability in the arch formation becomes important in the application of surgical techniques that can help in the treatment pathologies of the hand.

References


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