Case Report

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UNILATERAL INCOMPLETE SUPERFICIAL PALMAR ARCH VARIATION

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Abstract: In this case report, we want to present a truly incomplete superficial palmar arch on right side which is not completed by any of the branches of radial or median artery. On the left side of the same individual, the SPA is classical, completed by superficial branch of radial artery. The areria nervi mediana is not participating in arch formation on both the sides. Four palmar digital branches: digital branch to medial side of little finger and three common palmar digital arteries to the adjacent sides of medial four digits are seen arising from incomplete palmar arch. Awareness of the variation among the individual patient's both hands need to be well thought-out during hand surgeries.

Keywords: Common digital artery, superficial palmar arch, ulnar artery

INTRODUCTION

Deep to the palmar aponeurosis, superficial palmar arch (SPA) or volar arch is a prominent structure. Ulnar artery cross the flexor retinaculum and run lateral to pisiform and then turn to lateral side. It exhibits a distally convex curved course known as SPA. It is completed laterally by any one of these: 1. superficial palmar branch of the radial artery; 2. Arteria princeps pollicis; 3. Arteria radialis indicis or 4. Arteria nervi mediana which accompanies the median nerve. The arteria princeps pollicis and arteria radialis indicis are branches of deep branch of radial artery.[1, 2] Variations of SPA both as complete and incomplete is extensively reported in literature. Bilateral asymmetry is common. Functionally, these variations are significant during surgery and Carpel tunnel syndrome.[3, 4] Colour Doppler ultrasonography help to visualize and map individual pattern before surgical intervention.[5]

MATERIAL AND METHODS

During routine undergraduate dissection, at Dept of Anatomy, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamilnadu the variation was noticed. A formalin-fixed male cadaver aged 60 years whose case history and cause of death is not known was dissected. Exposure of the arterial tree of the hand and forearm was done following classical incision and dissection procedures. Structures: skin, palmar aponeurosis, veins and fat were resected and sacrificed to achieve optimum exposure of the arteries. The variation was noticed on right side whereas left side was complete normal arch. All arteries and nerves were dissected and identified. The same procedure was followed on both the sides.

RESULTS

The course of ulnar and radial artery in arm and forearm on both the sides was normal. On right side the superficial brach of the ulnar artery was forming the superficial arch which is not completed by any of the usual branches of radial artery. Still the incomplete arch is fulfilling its usual role to supply the medial/ ulnar side of palm and adjacent sides of medial four fingers through three common digital branches.

On left side superficial branch of ulnar is joined by superficial branch of radial, forming a complete arch. Even here branch to medial side of hand and three common digital branches are seen. On sides, median artery/ arteria nervi mediana is not witnessed. The course and area of supply of branches from deep branch of radial artery; arteria radialis indicis and arteria princeps pollicis are usual.

DISCUSSION AND CONCLUSION

SPA is arterial arch is principally formed by superficial branch of ulnar artery.[6] The literature on variable SPA is rich and reported frequently. Comparatively, deep palmar arch is less variable and mostly complete. Coleman and Anson have studied 650 specimens to classify pattern of SPA into II main groups. Group I describes five subtypes of complete arch. Group II describes incomplete arch, which are further subdivided into four types. Almost all these subtypes are accounted in published literature.[7-12] superficial branch of radial artery may end up as a muscular branch to Abductor policies without contributing to SPA. The incidence is 14.2 % as reported by Ikeda *et al.*,[13]

The variation was unilateral and on right side. In the left palm classical radio ulnar arch formed by

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superficial palmar branch of radial artery with larger contribution from ulnar artery was documented. (Fig.1) Its incidence was 34.5 % in the study by Colman and Anson. An incomplete arch is defined as when ulnar artery fails to reach index and thumb or does not form anastomosis with any of the contributing branches. The variation described in this article belongs to group II, type B; as only the ulnar artery forms the SPA in the right palm, but the arch is incomplete as it does not supply the thumb and index finger. (Fig. 2)They have found the incidence of this type as 13.4% of the total 650 specimen studied by them.[14]

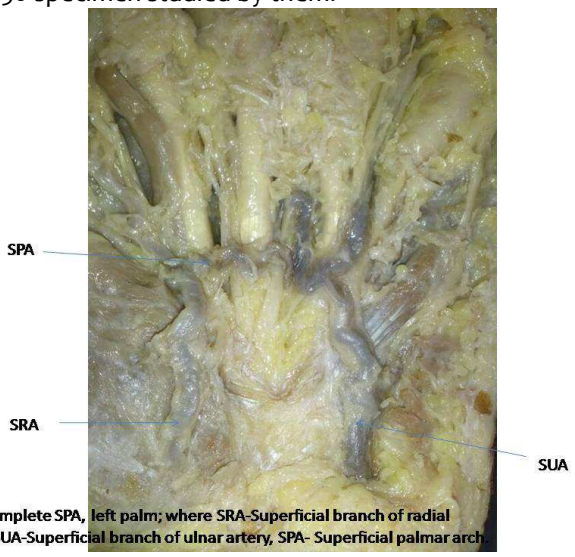

Fig 1: Complete SPA, left palm; where SRA-Superficial branch of radial artery, SUA-Superficial branch of ulnar artery, SPA- Superficial palmar arch

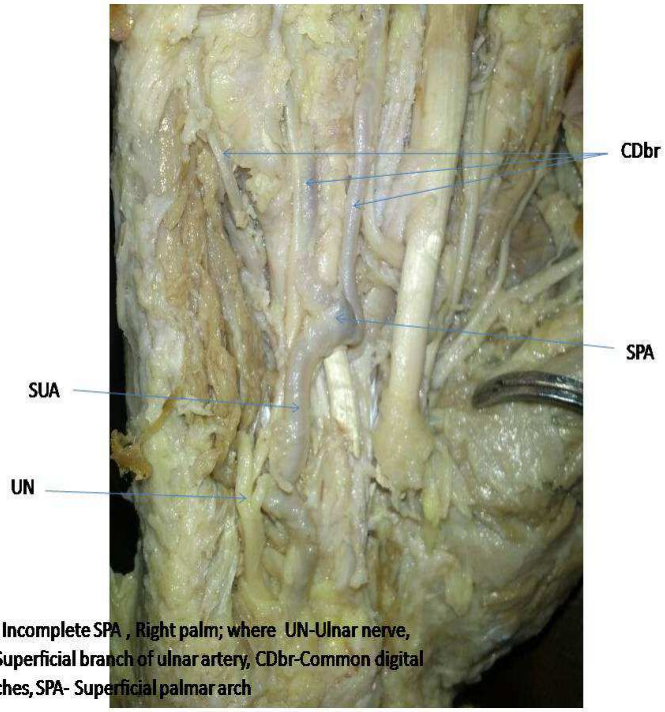

Fig 2: Incomplete SPA , Right palm; where UN-Ulnar nerve, SUA-Superficial branch of ulnar artery, CDbr-Common digital branches, SPA- Superficial palmar arch

SPA is a concern during post-trauma repairs, and pus evacuation. Existence, variation and healthy function are to be ascertained pre-operatively for finest results. Surgical procedures include arterial repairs, and vascular graft applications. Repairs using vascular graft use free or pedicle flaps depending on availability of radial and/ or ulnar artery. The goal is to maintain and not to hamper the perfusion of hands and digits. Thus making it mandatory for the surgeon to know anatomy, variations and variation in that particular limb of concerned individual.[15]

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