Review Article

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A REVIEW ON HAST AND PARVSANDHI (PALM AND PHALANGEAL JOINTS): AN AYURVEDIC AND MODERN PERSPECTIVE

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ABSTRACT

Ayurveda is called the science of life. It teaches us not only to deal with disease but also how to improve and maintain health. Along with modern anatomy, terms like marma, kurcha, and asthisamghat gave precise information about sharir rachana. The knowledge about the structural part of hast and parv pradesh helps the treatment. The human body is designed for grasping, precise movements and for serving as a tactile organ. There is a big area in the brain's motor cortex for muscles. Sandhi is formed by more than one bone, ligament and other structures. They are essential for locomotion and various movements of the body. There are two hundred and ten sandhi's in body, and they play various movements. Small sandhi is called khuda sandhi. They are fifteen in number, according to Acharya Sushruta.

Keywords: Hand, Parvsandhi, Marma.

INTRODUCTION

The hand is made up of an association of carpals, metacarpals and phalanges. The carpals are made up of eight bones arranged in two rows. Each hand has fourteen phalanges, three for each finger and two for the thumb. Each phalanx has a head, shaft and base. Sesamoid bones are also present there.

The interphalangeal joints of the hand are synovial hinge joints, and radiocarpal joints are synovial ellipsoid joints. The metacarpal bones of the hand are five miniature long bones numbered from lateral to medial side. Each bone has a head placed distally shaft and a base set at the proximal end. The function of the hand is to grip, grasp and form precise movements, for example, writing and sewing.[1]

Bones of hand
Carpals – 8
Metacarpal – 5
Phalanges – 14
Each finger has three phalanges, and the thumb has two phalanges. [2]

Joints of hand
There are four main joints in hand they are as follows [3]
Interphalangeal joints are the hinge joint between the finger bones.
Metacarpophalangeal joints are the joint between the finger and the palm.
Intercarpal articulation is the joint between the heads of metacarpals and proximal phalanges.

The wrist joint is a synovial joint of the ellipsoid variety between the lower end of the radius and articular disc of the inferior radioulnar joint proximally and three lateral bones of the proximal row of carpus that is, scaphoid, lunate and triquetral distally.

In the wrist joint, the carpal bones form the joint with radius, intercarpal joints (the joint between the carpals). The carpometacarpal joint (the joint between the carpals and metacarpals). Here exclusive movements are permitted. Each second to fifth digit moves at the metacarpophalangeal proximal and distal interphalangeal joints.[4]

Muscles of hand
Thenar muscles form thenar eminence of the palm. [5]
Lumbricals are four in number.
Palmar and Dorsal interossei.

Each muscle group has four tendons.
Thenar eminence consists of the muscles abductor pollicis brevis, flexor pollicis brevis, opponens pollicis, and adductor pollicis. The median nerve supplies all these muscles except adductor pollicis, which is supplied by the deep branch of the ulnar nerve.
Hypothenar eminence consists of abductor digiti minimi, flexor digiti minimi and palmaris brevis. Deep and superficial branches of the ulnar nerve supply all these muscles. The hypothenar muscle functions are abduction and adduction of the thumb, flexion of metacarpal phalangeal joints and pulls of the thumb medially and forward across the palm. It also abducts and flexes the little finger, pulls the metacarpal forward as a cupping of the palm and wrinkles the skin to improve the grip.

Lumbricals, the lumbricals have four tendons of flexor digitorum profundus. They are unipinnate and bipinnate. The action of lumbricals is flexion of metacarpal phalangeal joints and extension of interphalangeal joints. The median nerve supplies

the first and second lumbrical, and the deep branch of the ulnar nerve supplies the remaining three.

Palmar interossei originated from the medial and lateral sides of the head and shaft of the metacarpal and is inserted on the proximal phalanges and base of phalanges.

Dorsal interossei originate from the metacarpal shaft and are inserted on distal phalanges. They flex and extend the metacarpal phalangeal joints and interphalangeal joints, respectively. Both the palm and dorsal interossei are supplied by the ulnar nerve.

The palmar aponeurosis is a deep fascia which is thin over the thenar and hypothenar eminence and thick over the palm. In this way, they form the palmar aponeurosis. The fibrous sheath of the fingers holds the tendons in position during the flexion of digits. The synovial sheath of long flexor tendons' fingers is a lubrication device to prevent their function while moving within the osseofibrous tunnels. Digital synovial sheaths allow the digits to move freely or smoothly with minimum friction.[6]

Nerves of hand: There are two main nerves in the hand, the ulnar nerve and the median nerve. The ulnar nerve has two branches, superficial and deep, which supply to the little finger and half part of the ring finger. The median nerve provides the sensory innervation to the medial side of the index finger, middle finger and lateral side of the index finger.[8]

The arteries of the hand are the terminal parts of the ulnar and radial arteries. The superficial arch represents an important anastomosis between the ulnar and radial arteries. 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.

Relations of the superficial palmar arch lie deep to the palmaris brevis and the palmar aponeurosis. It crosses the palm over the flexor digiti minimi and the flexor tendons of the fingers, lumbricals, and digital branches of the median nerve.

Venous drainage, mainly two veins, is supplied to the hand. They are cephalic and basilic vein branches of the dorsal venous arch. The dorsal venous arch lies on the dorsum of the hand, including a dorsal vein from the medial side of the little finger. Three dorsal metacarpal veins from the radial side of the index finger. The two dorsal digital veins from the thumb are present in most of the blood from the palm course through veins passing around the margin of the hand and perforating veins passing through the interosseous spaces.[10]

Lymphatic drainage, axillary lymph nodes drain the lymph from the hand. The axillary lymph node comprises anterior, posterior, lateral, central and apical groups. The superficial lymphatics are much more numerous than the deep lymphatics. They collect lymph from the skin and subcutaneous tissues. The lymphatics run along the main blood vessel of the limb and end in the axillary nodes.

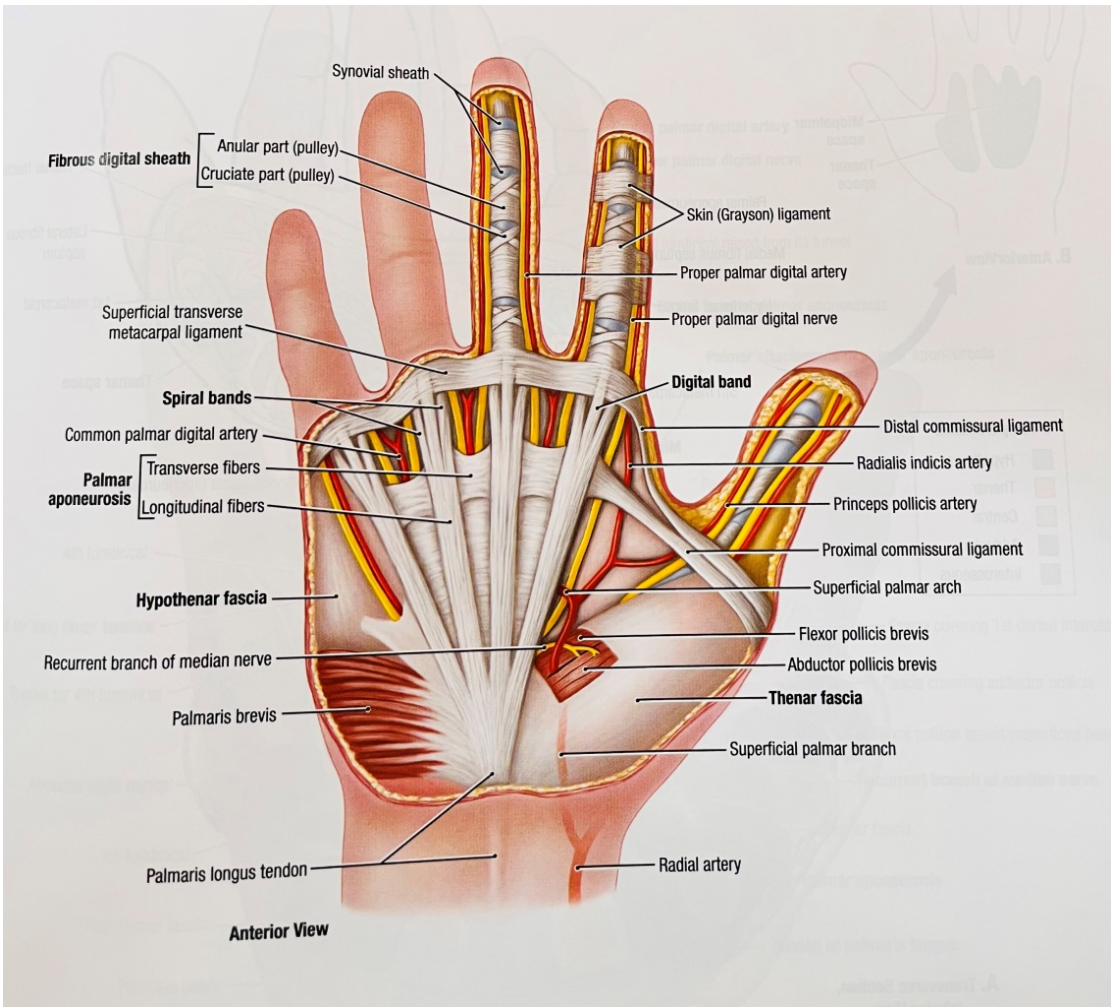

Image 1: Palmar aspect of hand thenar hypothenar fascia[7]

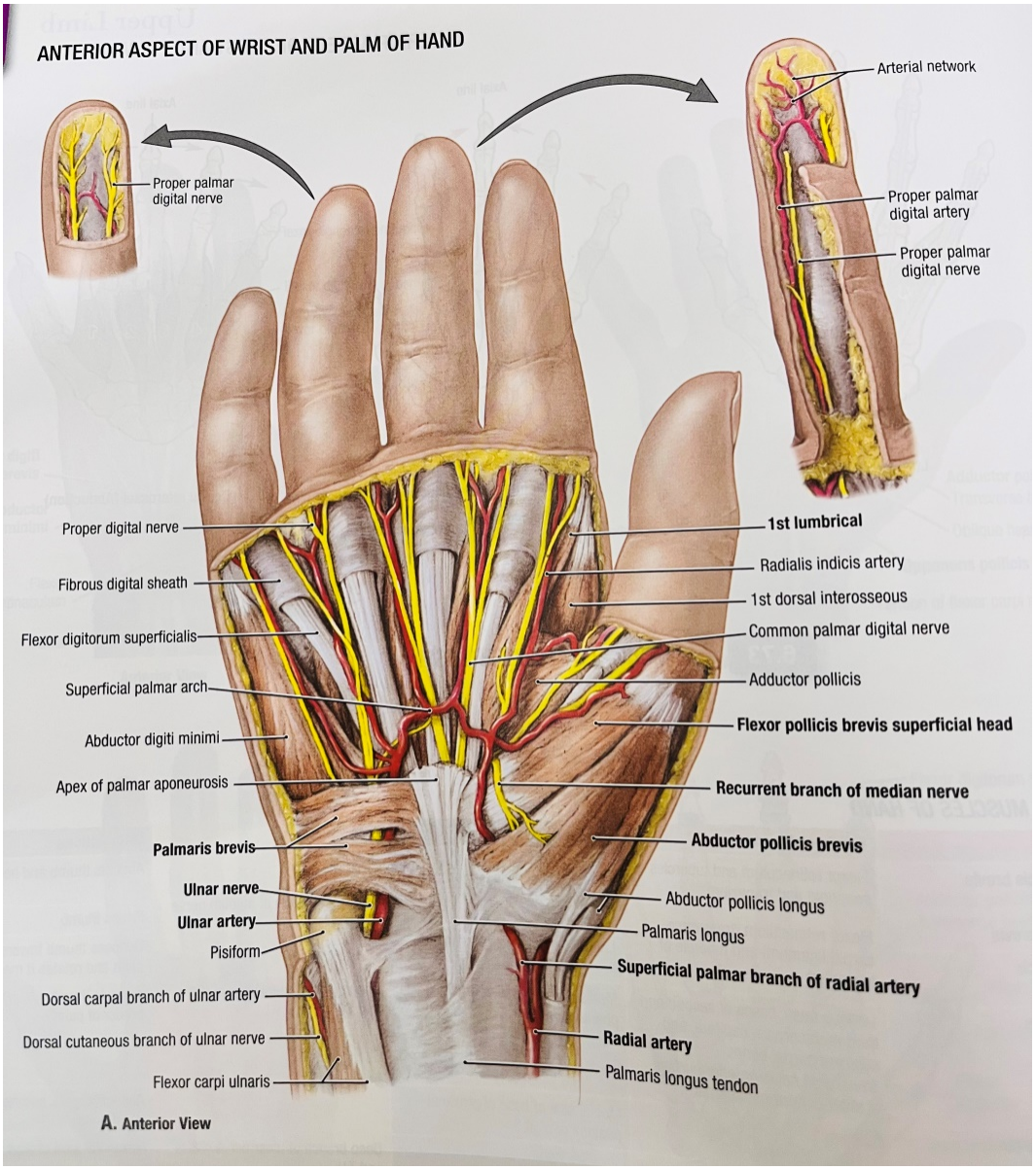

Image 2: Nerves and arteries of hand anterior view [9]

Clinical anatomy

The fracture of the scaphoid is prevalent. This fracture is happened due to a fall on an outstretched hand or the tip of the fingers. The bone fracture through the wrist at the angles to its long axis. This causes tenderness and swelling in the anatomical snuff box. It can cause pain on longitudinal percussion in the thumb and index finger.[11]

Carpal tunnel syndrome dislocation of the lunate may be produced by a fall on an acutely dorsiflexed hand with the elbow joint flexed. This displaced the lunate anteriorly. The symptoms are numbness, hand clumsiness, hand pain at night and hand weakness.

Bennett's fracture is the fracture of the base of the first metacarpal. It involves the anterior part of the base and the fracture caused by the force along its long axis. The thumb is forced into a semi-flexed position and cannot be opposed. The fist cannot be clenched.[12]

The structure of the hand (according to Ayurveda)

Jaal is the network of muscles. It is the combination of ligaments, vessels and bones in the hand. Jaal is the only structure present in the wrist and ankle region. There are three types of jaal mamsa, sira and snayu jaal.[13]

Marma: There are five marmas present in the hast region. They are kurch, kurchshir, kshipra, manibandh and talhridaya. The manibandha marma is sandhi marma. The talhridaya marma is mamsa marma and remaining marma is snayu marma.[14]

Asthisanghat: In asthisanghat, more than two bones come together. The carpals, metacarpals, lower end of the radius, and ulna come together in the hast region.[15]

DISCUSSION

The human hand is made up for grasping, for precise movements. There are unique structures present in the hast region, like jaal and asthi sanghat. According to modern science, the hast region contains bones and muscles like the thenar and hypothenar. It also

includes the joints like the metacarpophalangeal joint and the intercarpal joint. The branch of the radial and ulnar arteries supplies the blood to the hand, and tributaries of the cephalic and basalic veins drain the blood. The deep fascia of the palm, called palmar aponeurosis, contains the palmaris tendon and fixes the palm's skin, thus improving the grip. It also protects the underlying tendons, vessels and nerves. Different marma on hand is also essential to study any injuries and fractures.

CONCLUSION

An assessment of the anatomy of the hand region according to modern science and Ayurveda shows an enormous and different field of vision. Studying intrinsic muscles, blood vessels and nerves illustrates the precise structural knowledge of the hand region. According to Ayurveda, the marma is the vital point on the hands jaal and asthisanghat are unique structures. Anatomy knowledge supports the examination of a patient, the formation of a diagnosis and the communication of these findings to the patient and other medical professionals.

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