Palm Of Hand Anatomy

Palm of Hand Anatomy is a complex and intricate structure that plays a vital role in the functionality of the human hand. The palm, located on the inner side of the hand, is not only responsible for a wide range of movements but also serves as a critical area for sensory perception and grip strength. Understanding the anatomy of the palm is essential for both medical professionals and anyone interested in the biomechanics of the hand.

Overview of the Palm

The palm of the hand is distinguished by its unique anatomical features, which comprise bones, muscles, tendons, ligaments, nerves, and blood vessels. The palm is crucial for performing everyday activities, such as grasping objects, writing, and typing. Its anatomy can be categorized into several key components:

- Bones: The skeletal structure of the palm.
- Muscles and Tendons: The tissues that facilitate movement and grip.
- Nerves: The pathways that provide sensory feedback and motor control.

- Blood Vessels: The circulatory components that supply nutrients and oxygen.

Bones of the Palm

The palm consists of a variety of bones that provide structure and support. These bones can be categorized into three main groups:

Carpals

The carpal bones form the wrist and the base of the palm, comprising eight small bones arranged in two rows:

1. Scaphoid
2. Lunate
3. Triquetrum
4. Pisiform
5. Trapezium
6. Trapezoid
7. Capitate
8. Hamate

These bones articulate with the radius and ulna of the forearm, facilitating wrist movement and serving as the foundation for the hand's structure.

Metacarpals

The five metacarpal bones extend from the carpal bones to the base of the fingers. They are

numbered one to five, starting from the thumb (first metacarpal) to the little finger (fifth metacarpal). Each metacarpal consists of a base, shaft, and head, contributing to the palm's overall shape and function.

Phalanges

Each finger comprises three phalanges—proximal, middle, and distal—except for the thumb, which has only two (proximal and distal). The phalanges allow for flexion and extension, contributing to the dexterity of the fingers.

Muscles and Tendons

The muscles responsible for the movements of the palm can be divided into two primary categories: intrinsic and extrinsic muscles.

Intrinsic Muscles

Intrinsic muscles originate and insert within the hand itself. They are primarily responsible for fine motor control and dexterity. The main intrinsic muscles of the palm include:

- Thenar Muscles: Located at the base of the thumb, these muscles allow for thumb opposition, which is essential for grasping and pinching.
- Hypothenar Muscles: Located at the base of the little finger, these muscles enable movements like abduction and flexion of the little finger.
- Lumbricals: These four muscles arise from the tendons of the flexor digitorum profundus and flex the metacarpophalangeal joints while extending the interphalangeal joints.
- Interossei Muscles: Located between the metacarpal bones, these muscles are divided into dorsal

(abduct fingers) and palmar (adduct fingers) interossei.

Extrinsic Muscles

Extrinsic muscles originate in the forearm and extend into the hand through tendons. They are primarily responsible for gross movements of the hand and include:

- Flexor Muscles: These muscles (e.g., flexor digitorum superficialis and flexor digitorum profundus) allow for the flexion of the fingers and thumb.
- Extensor Muscles: These muscles (e.g., extensor digitorum, extensor pollicis longus, and extensor pollicis brevis) enable the extension of the fingers and thumb.

Nerves of the Palm

The palm of the hand is richly supplied with nerves that are essential for both sensory perception and motor control. The major nerves involved are:

Median Nerve

The median nerve innervates the thenar muscles and the first two lumbricals. It provides sensory innervation to the palmar aspect of the thumb, index finger, middle finger, and half of the ring finger. Compression of the median nerve can lead to conditions like carpal tunnel syndrome.

Ulnar Nerve

The ulnar nerve innervates the hypothenar muscles, the third and fourth lumbricals, and all the

interossei muscles. It provides sensory innervation to the palmar aspect of the little finger and half of the ring finger. Damage to the ulnar nerve can result in a claw hand deformity.

Radial Nerve

While the radial nerve primarily supplies the back of the hand, it does provide some sensory innervation to the area around the base of the thumb. It is less involved in the motor control of the palm compared to the median and ulnar nerves.

Blood Supply

The blood supply to the palm is primarily provided by the radial and ulnar arteries, which branch off from the brachial artery in the forearm.

Radial Artery

The radial artery supplies blood to the lateral aspect of the palm and helps form the deep palmar arch, which provides additional blood supply to the fingers.

Ulnar Artery

The ulnar artery supplies blood to the medial aspect of the palm and contributes to the superficial palmar arch, supplying the fingers with oxygenated blood.

Functions of the Palm

The palm is essential for a variety of functions, including:

- Gripping: The unique combination of muscles and tendons allows for a strong grip on objects.
- Manipulation: The dexterity of the fingers enables complex movements, such as typing or playing musical instruments.
- Sensory Feedback: The numerous nerve endings in the palm provide valuable sensory feedback, allowing for precise movements and interactions with the environment.

Conclusion

Understanding the anatomy of the palm of the hand reveals the complexity and functionality of this vital component of the human body. The interplay between bones, muscles, nerves, and blood vessels allows for a wide range of movements and sensory experiences. Whether in medical practice or daily life, an appreciation of palm anatomy can enhance our understanding of hand function and health. As research and technology advance, further insights into palm anatomy and its implications will continue to emerge, benefiting both healthcare professionals and the general public.

Frequently Asked Questions

What are the main components of the palm of the hand?

The main components of the palm include the skin, muscles, tendons, nerves, and blood vessels. The palm has a unique structure that allows for dexterity and grip, featuring the thenar and hypothenar muscles that control thumb and little finger movement, respectively.

How does the anatomy of the palm contribute to grip strength?

The anatomy of the palm, including the arrangement of muscles, tendons, and the palmar aponeurosis, plays a crucial role in grip strength. The flexor tendons allow for bending of the fingers, while the intrinsic muscles help stabilize the fingers for a secure grip.

What is the significance of the palmar fascia in hand anatomy?

The palmar fascia is a fibrous tissue that provides support to the skin of the palm and helps in the function of grip. It also protects the underlying structures and is involved in conditions such as Dupuytren's contracture, where the fascia thickens and causes finger deformities.

Which nerves are primarily involved in the sensation of the palm?

The primary nerves involved in the sensation of the palm are the median nerve, ulnar nerve, and radial nerve. The median nerve supplies sensation to the thumb, index, middle, and part of the ring finger, while the ulnar nerve supplies the little finger and the other part of the ring finger.

How does the anatomy of the palm change with age?

As people age, the anatomy of the palm can change due to a loss of fat and elasticity in the skin, degeneration of muscles, and reduced blood flow. These changes can lead to decreased grip strength and increased vulnerability to injuries and conditions like arthritis.

Palm Of Hand Anatomy

Anatomy of the Hand - Doctor 2020
The medial and lateral borders are continuous with the thinner deep fascia covering the hypothenar and thenar muscles. - Each borders give fibrous septa pass posteriorly into the palm and take part in the formation of the Palmar Pascial Spaces

“The clinical anatomy of the Han - USMF
“The clinical anatomy of the Hand” The distal part of the upper limb is divided in to three regions: The wrist (carpus) The hand (metacarpus) The digits (fingers)

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The skeleton of the hand, wrist and forearm consists of 29 bones (diagram 1). The 2nd and 3rd metacarpals (MC) and the distal row of the carpus are the fixed elements of the hand.

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It is important to understand the normal anatomy of the hand in order to learn about diseases and conditions that can affect our hands. The wrist is comprised of 8 bones called carpal bones. …

Hand - University of Utah
- Curves dorsally around the scaphoid and trapezium in the floor of the anatomical snuff box; enters the palm between the heads of the 1st dorsal interos-seous m.; turns medially and …

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Images from The Hand: Examination and Diagnosis, 3rdEdition Written by American Society for Surgery of the Hand Published by Churchill Livingstone . No part of these images may be …

Functional And Surgical Anatomy Of The Hand Second Edition
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FRONT OF FOREARM & PALM OF HAND
MOVEMENTS OF THE HAND: Functional division of the hand when holding an object is not the midline, but: Thenar eminence and thumb on one side Fingers, palm and hypothenar …

Hand Anatomy - Hong Kong Polytechnic University
The hand-vein biometric represents the uniqueness in the anatomy of hand-veins while the palmprint represents epiderm on the palm. The behavioral biometrics like signature is also …

Anatomy - Hand - vompti.com
• Deep fascia that covers the palm. Anchored to skin distally • Apex is continuous w/ Palmaris longus tendon/flexor retinaculum • Distal fibers to base of each digit • Function: Protection of …

Anatomy and Radiography of the Wrist, Hand, and Fingers
The objective of this home study course is to provide the learner with a computer based tutorial that will give them the means to learn the anatomy and radiography of the wrist, hand and …

The Anatomy and Mechanics of the Human Hand
Of course whole volumes have been written on hand anatomy, and it is not pos sible in a short article to describe all elements in detail. It is helpful, however, to review the basic construction …

Bones of the Hand
The hand includes the carpals (wrist), metacarpals (palm) and phalanges (fingers and thumb). The hand has 27 bones; 8 carpels in the wrist, 5 metacarpels in the palm and 14 phalanges …

Palm Of Hand Anatomy (book) - interactive.cornish.edu
Hand and Wrist Anatomy and Biomechanics Bernhard Hirt,Harun Seyhan,Michael Wagner,2016-10-12 Hand and Wrist Anatomy and Biomechanics A Comprehensive Guide There is a

saying …

The Fascinating Functional Anatomy of the Human Hand
In this article, we will explore the functional anatomy of the human hand and appreciate the incredible biomechanics that underlie our ability to perform a wide variety of tasks.

Palm Tendons - medicine.nus.edu.sg
The muscles of the hand can be divided into those forming the thenar eminence, the hypothenar eminence, the adductor muscle of the thumb, the long flexor tendons and the atached …

FASCIAL SPACES IN HAND
Aknowledgements Human Anatomy by BD Chaurasia Gray's Anatomy Essentials of Human Antomy: Upper Limb and Lower Limb by Asimkumar Dutta

PowerPoint Handout: Lab 11, Anterior Forearm & Palmar Hand
Carpal Tunnel The carpal tunnel is a confined passageway consisting of firm walls through which some structures pass to enter the palm of the hand. The boundaries of the carpal tunnel …

FOREARM, WRIST, HAND & DIGITS
Δ ulnar bone takes no part in formation of wrist joint. NOTE the lower end of the radius is set obliquely, sloping palm downwards.

Clinical Anatomy of the Hand - reumatologiaclinica.org
Look at this region, known as region V or metacarpophalangeal by hand surgeons, from the palm, the radial side and the dorsum to get an idea of its complexity. More distally in the palmar side …

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