

Biomechanics
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Lecture – 30
Finger Muscles

When I come welcome to this video on biomechanics we have been looking at the biomechanical analysis of the joints of the upper limb. In the previous videos we looked at the shoulder joint elbow joint and wrist joint.

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In this class...

1. Finger Muscles

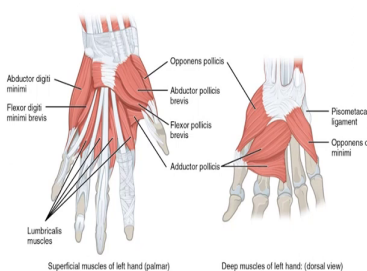


Biomechanics

In this video we will be looking at the muscles that supply and span the joints of the fingers.


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Finger Muscles



- Thenar eminence -**
 - Base of the thumb
 - Made up of 3 muscles control the movements of the thumb
- Hypothenar eminence -**
 - Base of the fifth digit (little finger)
 - made of 4 muscles which contract to manifest motion through the little finger

https://upload.wikimedia.org/wikipedia/commons/0/0e/1121_Intrinsic_Muscles_of_the_Hand.jpg, CC-BY-4.0



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So, finger moments themselves are made possible through muscles that supply the joints through long tendons that span across the wrist these are the so-called extrinsic finger muscles but then there are also muscles that are present within the hand these muscles are called as the intrinsic muscles. So, within these we have two major types of muscles to measure classification one is the set of muscles that supply the thumb they are located in the thinner eminence at the base of the thumb right.

At the base of the thumb they are made up of three muscles that control the movements of them very crucial function thumb moment for dexterity. Then you have the hypotenar eminence base of the fifth digit here base of the fifth digit. This is the base of the fifth digit this is the first digit second third fourth fifth is the fifth digit base of the fifth digit the little finger. And this is made up of four muscles that contract to produce movement of the little finger.

Often overlooked is the contribution of little finger to hand dexterity because we think it is a baby finger it is a little finger it is a pinky it is this important to note that only the little finger and the thumb have their own special muzzle supply. Of course part of this is due to the fact that they have the extra space in which you could house these muscles because the other three muscles because the other three fingers are located between these two fingers and so, there is not enough space to host individual finger movement muscles that is understood.

But the little finger also has special muscles just like the thumb. So, when it comes to dexterity when it comes to special nature I would say this is arguable I would say that the little finger is arguably the second most dexterous finger in terms of kinematics and in terms of articulation movement and muscle supply controversial statement.

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Finger Muscles

Flexor digiti minimi brevis

Origin	Insertion	Actions
From the hook of <u>hamate</u> and flexor retinaculum	The medial side of base of the <u>proximal phalanx</u> of the <u>little finger</u>	<u>Flexion of the MCP joint of the little finger</u>
This muscle lies laterally to the abductor digiti minimi		

https://upload.wikimedia.org/wikipedia/commons/0/0e/1121_Intrinsic_Muscles_of_the_Hand.jpg, CC-BY-4.0

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So, what are these muscles abductor pollicis brevis. So, this originates on the flexor retinaculum tubercles of the scaphoid which is a carpal bone trapezium tendon of the abductor pollicis is longest. So, it receives Supply from a different muscle which is abductor pollicis longus and then it inserts on the radial side of the base of the proximal phalanx of the thumb which is this is the proximal phalanx of the thumb.

It attaches here right radial side of the base of the proximal Phalanx of the thumb what is its function. It abducts the thumb at right angles to the plane of the palm this is the plane of the palm that updates the thumb at right angles to the plane of the pump and rotates the thumb medially. So, some important contributions to dexterity here then you have flexor digiti minimi brevis. From the name we can try and guess where is it supplying because the name includes the word minimi.

Minime means a muscle that supplies the little finger from the hook of the Hammett and fluxor retinocular column Hammett is a carpal bone. So, again originates within the hand. The insertion is on the medial side of the base of the proximal Phalanx of the little finger. So, just like you have this for the thumb you also have a supply close to the proximal Phalanx of the little finger responsible for flexion of the MCP joint of the little finger.

Remember that the little finger also has supply from the extrinsic muscle to do the same function.

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Finger Muscles

Flexor pollicis brevis

Origin	Insertion	Actions
Superficial- <u>Flexor retinaculum and tubercle of trapezium</u>	Radial side of base of proximal phalanx	Flexes the proximal phalanx of the thumb
Deep- Trapezoid and capitate bones		

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Then you have flux surpolysis brevis it is a superficial muscle or it is superficial head originates on the flexor retinol column and tubercle of the trapezium trapezium is a carpal bone remember this is trapezium. The deep muscle or the deep head originate and the trapezoid and the capitate bones trapezoid that is that and the capitate bones that is that. The insertion is on the radial set of the proximal Phalanx of the thumb what is its function of the thumb proximal phalanx of the thumb? Fraction of the proximal phalanx of the thumb is the function.

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Finger Muscles

Opponens digiti minimi

Origin	Insertion	Actions
Triangular muscle	Ulnar side of palmar surface of shaft of 5 th metacarpal bone	Flexion of the 5 th MCP
Hook of hamate and flexor retinaculum		Lateral rotation of the CMC and MCP of the 5 th digit

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Then you have a very special muzzle unique very very special muscle called opponens pollicis opponens pollicis. Again we can guess where it it is located in this function by the name opponens right. So, it originates from the flexor retinaculum in tubercles of the scaphoid and trapezium. Let us remember where is the scaphoid; that is the scaffold. This is

the trapezium and interacts with the adductor pollicis long tendon remember abductor pollicis longus is an extrinsic muscle.

Again attaches to the radial side of the base of the proximal phalanx of the thumb what is its function? Function is to rotate the thumb into opposition with the fingers rotate the thumb into opposition with the fingers like this it is a very unique function that humans can perform with a lot of finesse very unique function. While other animals can do this with some difficulty humans have the unique ability to do this partly maybe due to the presence of this well-developed opponens muscle.

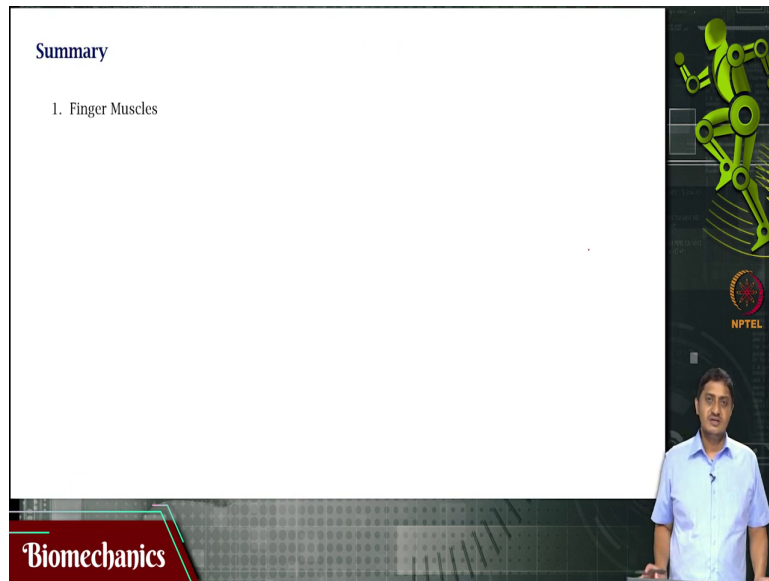
So, main function is opposition then you have opponens digiti minimi again minimum means little finger it is a triangular muscle that originates at the hook of the hamate and flexor digitorum profundus column where is the hamate remember that is the hamate originates at the hamate which is a carpal bone and attaches inserts onto the ulnar side of the palmar surface. Palmar surface the ulnar side this is the dorsal side another side the palmar surface of the fifth metacarpal.

So, very small muscle that means originates here which is the hamate right originates here and then attaches here an intrinsic muscle which is very very small. What is its function? Flexion of the fifth metacarpophalangeal joint and lateral rotation of the CMC and the MCP joint of the fifth digit or the little finger, so, flexion and lateral rotation of the little finger which is why we say that the little finger has some special ability. Not as much dexterity as the thumb definitely some slightly better dexterous supply.

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Summary

1. Finger Muscles



So, with this we come to the end of this video in this video we saw the muscles that Supply the fingers thank you very much for your attention.