

A Study of Muscle Morphology of Anterior Group of Forearm Muscles

Sharma¹, M., Chhabra², U., Kaushal², S., Patnaik³, V.V.G., Prashar², R.

¹Deptt. of Anatomy, Gian Sagar Dental College, Rampur, Banur, Punjab, India,

Email: *rprashardr1195@rediffmail.com*

²Govt. Medical College, Patiala-147001, Punjab, India.

³Maharishi Markendeshwar Institute of Medical Sciences, Mullana-Ambala, Haryana, India.

Abstract

The study was done on 60 upper limbs (56 males and 4 females) of embalmed adult human cadavers obtained from the department of anatomy, govt. Medical college, patiala. The muscle fibre length, tendon length and total muscle length of the anterior group of forearm muscles were measured in all the 60 upper limbs. Amongst wrist flexors Flexor Carpi Ulnaris had the longer muscle belly than Flexor Carpi Radialis. In Flexor Digitorum Superficialis (FDS), FDS-Index had the longest muscle belly. In Flexor Digitorum Profundus (FDP), FDP-Middle had the longest muscle belly. The Pronator Quadratus had the smallest muscle belly with no tendon. Ratio of Muscle Fibre Length and Total Length for Flexor Carpi Ulnaris was more than Flexor Carpi Radialis. In FDS it was maximum for FDS-Index and in FDP it was maximum for FDP-Ring. As muscle length is related to the isokinetic strength, it is believed that the isokinetic strength of FCU is more than FCR and among FDS it is higher for FDS-Index and in FDP for FDP-Ring.

Keywords: Isokinetic Strength, Muscles, Muscle-Fibre-Tendon Ratio, Tendon Compliance

Introduction

Motions are the result of co-ordination by a number of muscles and tendons, some of them causing most of the motion, other deviating the direction of the motion and still other holding back the motion to make it slow and controlled (*Bunnel, 1948*).

The functional effect of a long, compliant tendon in series with muscle fibres was to increase the functional operating range of the muscle- tendon unit. The tendon compliance had its greatest functional effect in muscle- tendon unit with high tendon length/fibre length ratios. Thus in addition to muscle architecture, tendon length and tendon properties can also be

considered important design criteria, which should be considered in transfer procedure (*Zajac, 1989*).

Tendon injuries are one of the most problematic in hand surgery with respect to the restoration of normal function. To deal with these problems adequately, it is also essential to know certain facts about flexor tendon anatomy, function and physiological behaviour (*Kleinert et al, 1986*).

Tendon transfers are used primarily to improve function following damage to major nerve trunks, the brachial plexus or the cord and the brain and to substitute for motion lost through trauma to muscles in the forearm and the hand (*Boyes, 1970*).