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Extensor System Injury of the Hand

Thesis

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Master Degree in **General Surgery**

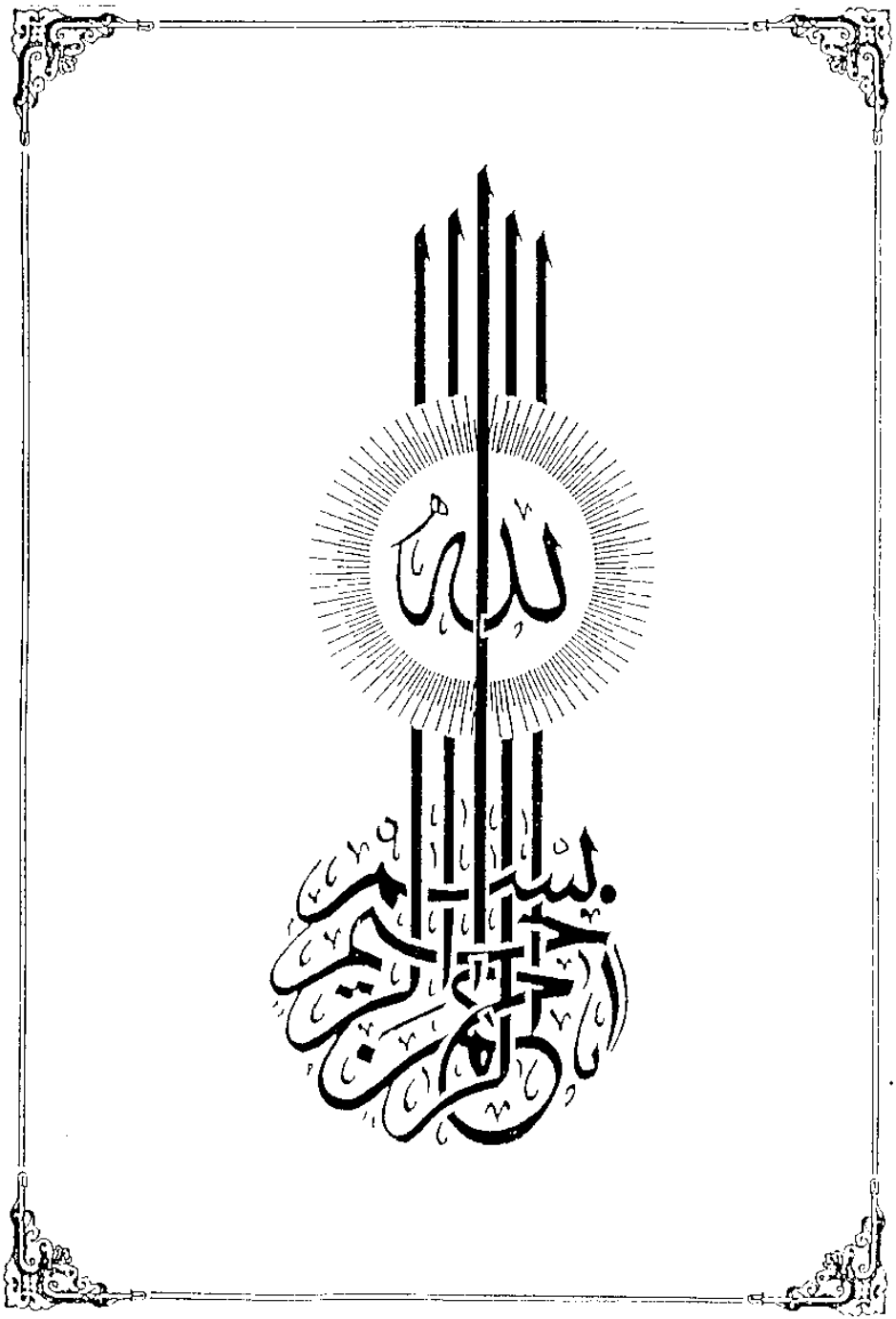
By
Bahaa Safwat Khalaf
M.B., B.Ch.

Supervised by

Prof. Dr. Amr Ali Salah Mahmoud
Professor of Plastic Surgery
Faculty of Medicine
Ain Shams University

Dr. Mahmoud Magdy Sherif
Assistant Professor of Plastic Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University
1999



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Introduction and aim of the work

INTRODUCTION

Extension of the fingers is a complex act and is considered to be more intericate than finger flexion. This mechanism is composed of two separate and neurologically independent systems namely, the radial nerve innervated extrinsic extensors and the intrinsic system supplied by the ulnar and median nerves (Doyle, 1988).

The extensor mechanism has been divided into zones as described by Verdan in 1975. Ten zones have been delineated and although the thumb is included in this zoning scheme, zones 2 and 3 are excluded in the thumb as it lacks a third phalanx. It is helpful to know that the odd numbered zones are located over the joint (Wehbe, 1984).

Repair of lacerated or ruptured tendon of the extensor system differs depending on the zone of injury (Kelly, 1959).

The extensor mechanism in the hand is extrasynovial except at the wrist where the tendons are covered with synovial sheath. Simple loss of continuity due to laceration or avulsion of the extensor tendons of the hand and fingers is usually not associated with immediate retraction of the tendon ends because of multiple soft tissue attachments and interconnections at various levels (Green and Rowland, 1991).

Injury of the extensor tendons of the hand are common. The extensors are predisposed to laceration because of their superficial location on the dorsum of the hand and minimal amount of subcutaneous tissue between the dorsum of the hand and the overlying skin. In many areas such as the distal finger joint, the tendon is very thin and subject to rupture with sufficient force. This anatomic feature also predisposes the extensor mechanism to more complex tendon injury including abrasion, crush and avulsion. Extensor tendon injuries are often associated with skin loss, fractures and intra-articular extension of the injury (Doyle, 1988).

The diagnosis of most extensor system lesions (acute and chronic) is relatively simple because of their superficial location, multiple soft tissue attachment and extrasynovial throughout most of their course. However, the thin nature of the extensor tendons and the proximity of the digital extensor to the critical joints of the hand and fingers all contribute to poor functional results following surgical treatment of the extensor lesions (Kaplan, 1959).

Because of the complex and delicate balance of the extensor mechanism in the finger, delayed or late treatment of the injury does not carry the same prognosis since it is often impossible to restore the delicate balance of the various components of the extensor mechanism, this is especially true in injuries over the proximal interphalangeal joint (P.I.P. joint) (Froelich et al., 1988).

It has been suggested that extensor system injury seen and treated early and properly usually responds well to treatment. However, a recent retrospective analysis of long term results of extensor tendon repair has suggested that this is not always true (Newport et al., 1990).

Static splinting has been the most widely used approach to the postoperative care of the extensor system injury. Static splinting is used for about 4 weeks followed by scheduled splint removal to begin protected range of motion.

Extensor system injury has gained deserved respect, because the results of treatment are not always as favorable as one assumed (Doyle, 1988).

Aim of the work:

Our aim of this work is to study extensor system injury of the hand; causes, types, pathological aspects, proper management and prognosis.

Anatomy of the extensor apparatus of the fingers

The extensor apparatus of the hand consists of two structural systems: the tendinous system and the retinacular system (Zancoli, 1968).

The tendinous system:

The tendinous system is represented by the terminal tendons of the extrinsic and intrinsic muscles (Zancoli, 1968).

Terminal extrinsic extensor tendons (Fig. 1):

The terminal extrinsic extensor tendons are represented by the extensor digitorum communis tendon (EDC), the extensor proprius of the index and the little fingers (Fig. 1), those are connected together by the juncturae tendinum (intertendinous bands), and extensor of the thumb.

The intertendinous band is the one between the extensor tendons of the index, middle, ring and little fingers. This band, studied with fingers extended, runs obliquely and distally from the extensor tendon of the ring finger to the middle finger tendon. The intertendinous band between the ring and little finger tendons is formed by the division of the extendor digitorum communis tendon of the ring finger (Fig. 1). Between the index and the middle fingers the intertendinous union is usually represented by a thin and wide fascia, condensed at

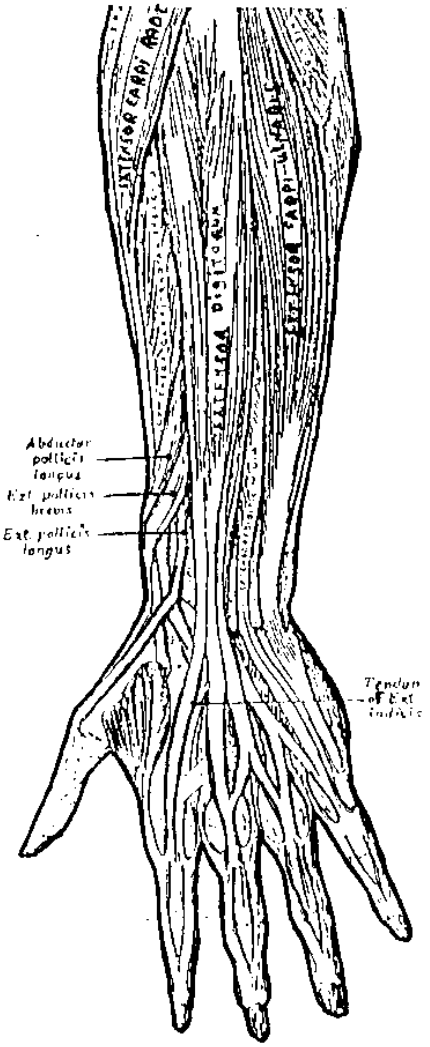

Fig. (1): Dorsal surface of the forearm superficial muscles *(MacConail and Basmajian, 1977, Gray's anatomy 38th ed.)*