MANAGEMENT OF NON UNITED FRACTURE OF THE SCAPHOID

THESIS

In Partial Fulfilment Of The Requirements
Of Master Degree Of Orthopaedics

BY

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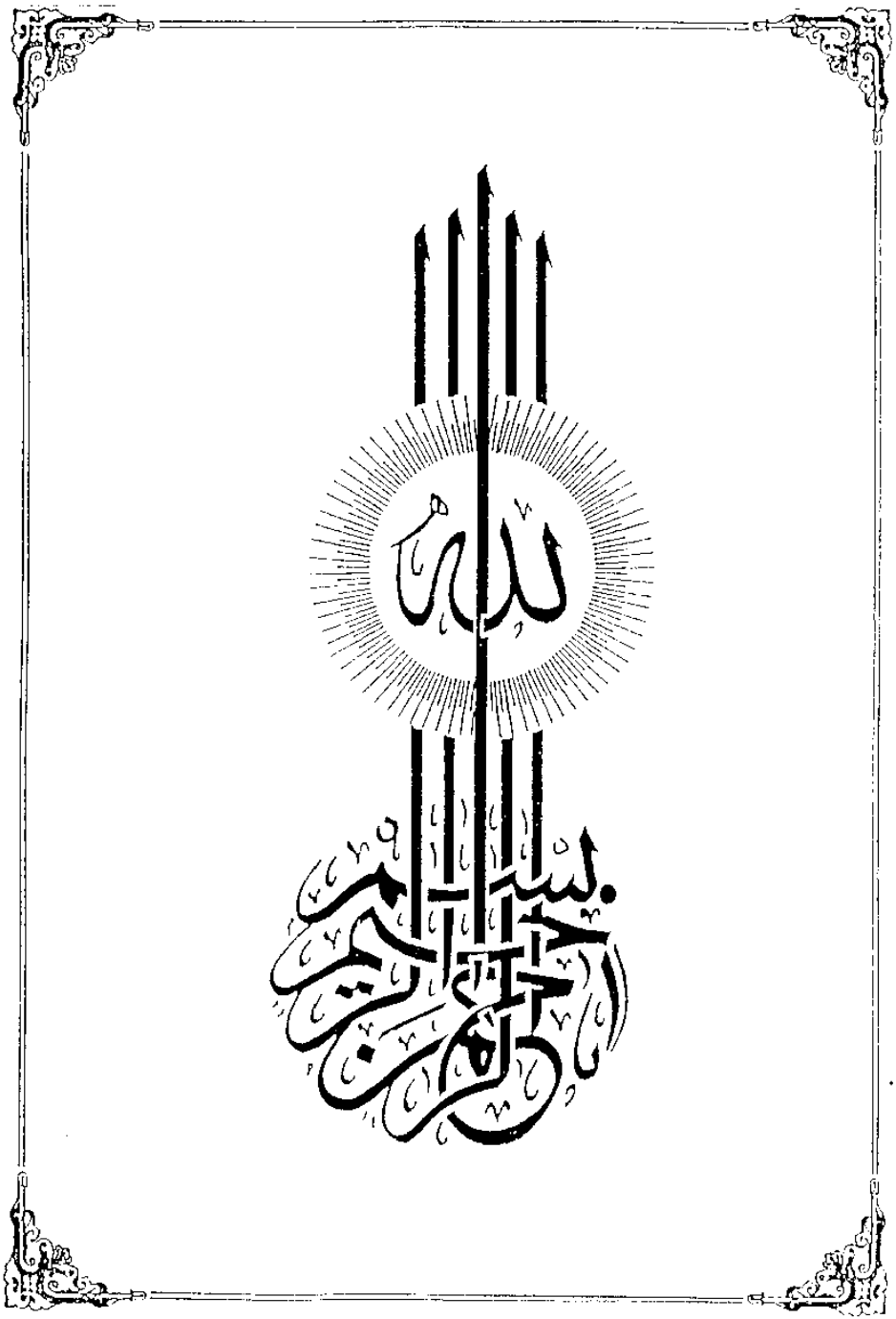
ALY YOUNES MAHRAN
"1985"



Contents.

CHAPTER 1

INTRODUCTION

INTRODUCTION

This thesis is presented to discuss the nonunited fractures of the scaphoid regarding their causes, pathology, clinical picture and the treatment.

The scaphoid nonunion occurs approximately in 5% of treated fractures scaphoid and unknown numbers of unrecognised fractures "Cooney 1984"

The fracture scaphoid is next to fracture involding the lower end of radius at wrist and nonunited fracture of the scaphoid is second to nonunited fracture neck of the femur "Edelstein 1939".

The fracture of scaphoid is a serious injury, particularly in manual worker because nonunion is frequent and the resultant disability may limit the usefulness of extrimity.

Although much has been written about the causes and treatment of nonunion and while several authors have stated that nonunion to degenerative arthritis, their treatment are very difficult.

The late sequalae of their complications, the painful wrist is a disastrous end for freely mobile important joint to every body.

The various measures adopted for its management through a light in difficulties in solving the problem.

In this work, I will review the literatures about, the anatomy and blood supply of the scaphoid, biomechanics of the wrist, causes and pathology of nonunion of the scaphoid and management by various methods.

CHAPTER 2

ANATOMY

The Anatomy of the scaphoid

It is the most lateral bone of the first carpal row. It bridges the proximal and distal rows in such an inter calated segment in an inherently unstable link system It acts as a connecting rod to stabilised the mid carpal joint.

The scaphoid lies at about 45 ° to the longitudinal axis of rows directed distally, laterally and slightly forewards .

Last (1978) stated that It is named from its fancied resemblance to a boat. This is because its medial surface is hallowed out, but actually. The scaphoid bone resembles no boat ever built by human hand

Surfaces:

It has six surfaces, three of which are articular; the proximal, distal and the medial. The remaining surfaces are non articular and serve mainly as points of ligamentous and muscular attachement; the lateral , dorsal and the volar. (Fig. (1))

(A) Non articular surfaces

1) The palmar or Anterior or volar surface.

It is part of the carpal canal. It is rough and triangular in shape.

It represents a concavity or notch, below which is a prominent tuberosity . The upper part of the deeper fibres of the retinaculum is attached to the tuberosity with a groove lateral to it. It is crossed by the tendon of the flexor carpi radialis.

The abductor pollices brevis muscle, gets some slight origin from the tuberosity out side the groove for radial flexor.

The tubercle is a blunt prominence to the thumb side of the distal surface and is palpable as clinical landmark.

11) The lateral surface:

It's narrow, rough, provides insertions to the lateral ligament of the wrist. It forms the lateral free border of the tubercle.

111) Dorsal surface :

It is also rough and slightly grooved and is narrower and shorter than the opposite volar surface, being encroached upon by the lower and upper articular surfaces.

It is pierced by a number of small nutrient foramina. which may be restricted to the lower half of the bone.

When these three non articular surfaces are considered together as unit, they form a heli-cardal band, a strip of rough band with vascular perforations.

B) Articular surfaces:

They occupy about two-thrids of the external surface of the scaphoid.

1) The medial surface (lunate surface)

It articulates with both capitate (distally) with deep concavity, and lunate (proximally) by small cresentic facet:

A small rough area between radial and lunate facets is for inter-osseous ligament connecting it with lunate bone.

2) The proximal or superior facet.

It is the largest articular surface and is convex in two planes to permit the articulation with the radius.

3) The Distal or inferior surface:

It artriculates with trapezium and trapezoid and is divided into corresponding areas by a badly marked ridge.

C) The waist:

It extends from the proximal and of the dorsal surface to the base of the tubercle twisting around the

longitedinal aspect of the scaphoid. The waist is palpable in the snuffbox, distal to the radial styloid .

Attachements:

- Few fibres of the abductor pollicis brevis muscle arise from tuberosity out side the groove for the flexor carpi radials.

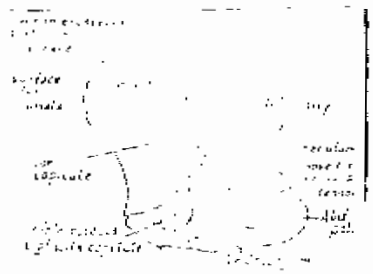
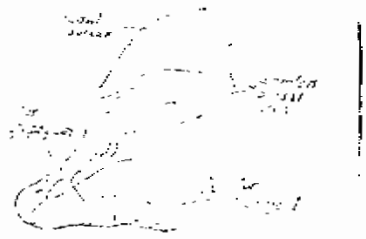


Fig. (1)

After Breathnach "1965"



- The flexor carpi radialis sometime gives a slip of attachement to the scaphoid and this tendon carries some blood supply to the bone.

- Ligaments attached to the scaphoid:- Fig. (2 & 3)

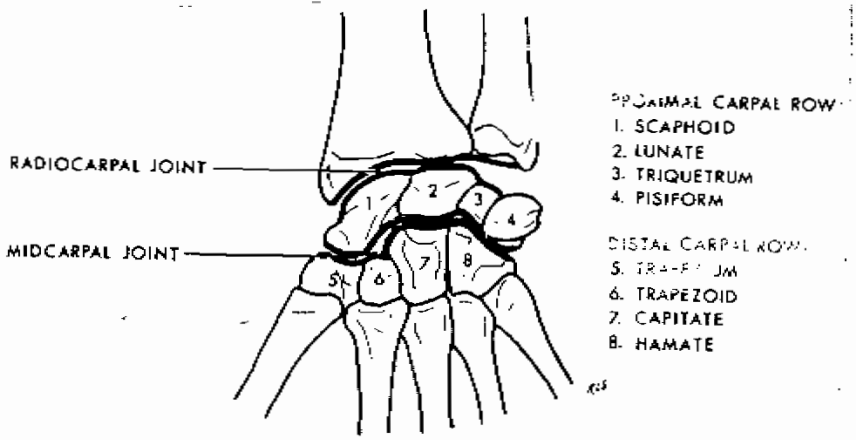
a) The ligaments of the wrist joint are attached as follows :-

= Lateral ligament to lateral surface;

= Posterior ligament to the dorsal.

= Anterior ligament to anterior surface.

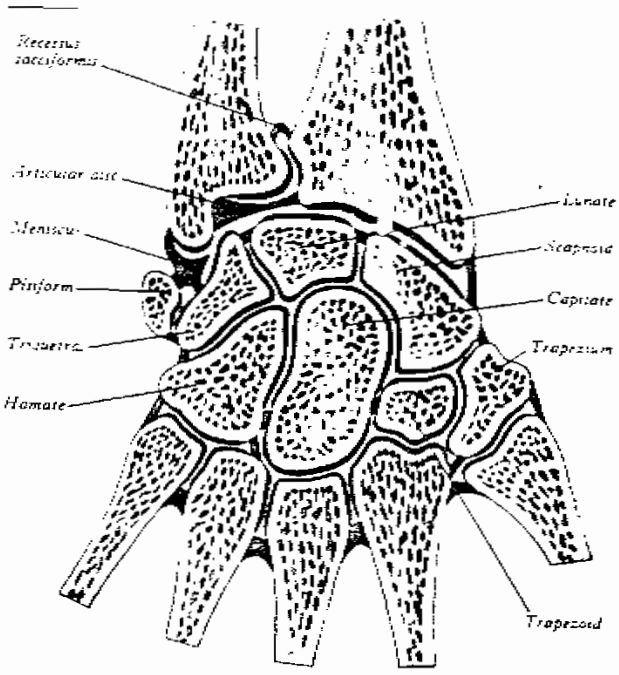
b) The flexor retinaculum is attached to the tuberosity of the scaphoid.



Radiocarpal and midcarpal joints and the relationships of the carpal bones.

Fig. (4)

After Swanson "1973"



A coronal section through the distal ends of the radius and ulna, the carpus and the proximal ends of the metacarpals, showing the general form of the articular surfaces, synovial cavities, interosseous ligaments and fibrocartilages. (Based in part on footnote reference **.)

After Grant's "1984"

Fig. (5)

3) Radiocarpal joint :-

The scaphoid and lunate together articulate with the radius. They are bounded by strong ligaments forming simple synovial joint.

Congenital Anomalies :

1) Bipartite scaphoid:-

This is due to the persistance of two centres of ossification, os central or os radial externum.

It can be distinguished from pseudo-arthrosis by the presence of a cleft smooth layer of compact bone on both sides of the cleft division of the bone in two almost equal parts and bilateral occurance.

Mulder (1966) stated that the existance of this condition "bi partite naviwlar" has been supposed by Hopf (1959), Cotta (1961) and Retting (1962).

According to Hopf, It can be distinguished from pseudo-arthrosis by the presence of smooth layer of compact bone on both side of cleft, division the bone in two almost equal parts, and bilateral occurance in his six cases, whereas one patient described by Cotta (1961) was supposed by the anthor to have a congenitally bi-partite

scaphoid in one hand and pseudo arthresis in the other, they difference being that the hand with congenital condition showed on abnormally wide seperation of the two fragments in the radiograph made in ulnar deivation .

According to Mulder (1966) the existance of congenital bi-partite scaphoid remains doubt-ful, as a signs mentioned by these authors are often found in obvious post traumatic pseudo arthrosis.

Boyes (1975) enumerated five criteria that give s support to the diagnosis of congenital bipartite scaphoid

1) Absence of history of trauma.
2) The presence of bilateral scaphoid bipartite.
3) Equal size and density of both ossicles.
4) The absence of degenerative changes in radial scaphoid (carpal articulation).
5) Clear space between the component with smooth edge at the joint surface.

Lewis and associates (1976) presented five cases that suggested the presence of congenital bipartite scaphoid but after doing microscopic section of number of embryologic specimens. They concluded that the bipartite scaphoid is of a traumatic origin .