

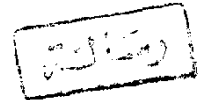
ROLE OF DUPLEX ULTRASONOGRAPHY IN DIAGNOSIS OF CASES OF DEEP VEIN THROMBOSIS OF THE UPPER EXTREMITY

An Essay
Submitted in Partial
Fulfilment of Master Degree in
DIAGNOSTIC RADIOLOGY

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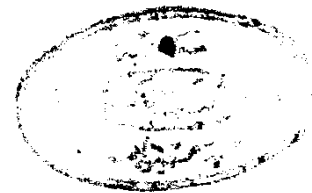
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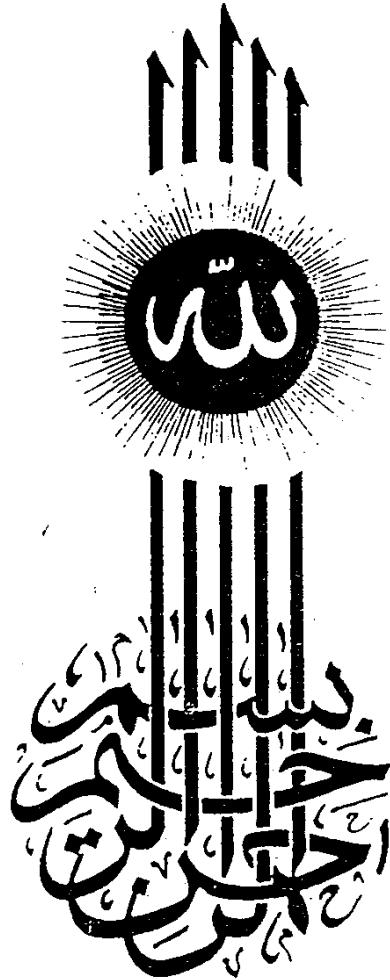


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Acknowledgement

I wish to express my sincere gratitude and deep appreciation to Professor Dr. Mohamed Abu-Alhoda, Assistant Professor of Radio-Diagnosis for his valuable help, great interest and continuous encouragement throughout the progress of this work.

I am indeed thankful to Dr. Hana Nassef, Lecturer of Radio-Diagnosis, Ain Shames University, who gave me a lot of her time, assistance and encouragement.

I should also like to express my thanks to all the staff members, my colleagues and to every person in the Radio-Diagnosis unit for their continuous support, co-operation and help.

Indeed I shall not forget them all my life.

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Contents

	Page
I. Anatomy of the venous system of the upper limb	1
II. Pathology of thrombus formation Clinical characteristics of DVT of the upper limb	10
III. Physics of Doppler	20
Pulsed Doppler	28
Color Duplex	36
IV. A) Indications of duplex examination of the venous system of the upper limb	40
B) Technique of duplex examination	42
V. Characteristics of duplex examination of the normal veins	50
VI. Appearance of thrombosed vein on duplex examination	59
VII. Discussion	66
VIII. Summary	80
XI. References	84
X. Arabic Summary	95

List of Figures

Chapter 1:

Fig 1 : veins of the dorsum of the hand

Fig 2 : superficial veins of the arm

Fig 3 : superficial veins of the arm & forearm

Fig 4 : axillary artery and veins

Fig 5 : superficial veins of the arm

Chapter II:

Fig 6 : pathogenesis of thrombosis.

Fig 7 : method of propagation in thrombophlebitis.

Chapter III :

Fig 8 : Doppler principle.

Fig 9 : Doppler angle.

Fig 10 : continuous wave Doppler.

Fig 11 : Pulsed Doppler.

Fig 12 : Operation of pulsed Doppler.

Fig 13 : Aliasing.

Fig 14 : Spectrum analysis.

Fig 15 : Sample volume.

Fig 16 : Laminar flow.

Fig 17 : Disturbed flow.

Fig 18 : Color duplex.

List of Figures (Cont.)

Chapter IV

- Fig 19: Examination of subclavian vein .
- Fig 20: Doppler findings of normal subclavian vein
- Fig 21: Size of jugular vein changes with respiration
- Fig 22: Cephalic vein
- Fig 23: Axillary and brachial Veins examination.
- Fig 24: Brachial vein
- Fig 25: Basilic vein.
- Fig 26: Examination of the forearm veins
- Fig 27: Duplicated radial vein.

Chapter VI

- Fig 28 : Free floating thrombus.
- Fig 29: The thrombosed vein is not compressable.
- Fig 30: Chronic thrombosis.

Chapter VII

- Fig 31: Numerical and graphic location of thrombi
- Fig 32: Subclavian vein examination shows no flow

List of tables

	Page
Protocol for upper extremity venous examination.	48,49
Table 1 : Findings in upper extremity scans.	68
Table 2: Location of thrombosis in 85 extremity .	70
Table 3: Axillary subclavian venous thrombosis.	70
Table 4: Jugular vein thrombosis.	73
Table 5: Summary of findings in patients with suspected venous thrombosis	

Introduction

Upper extremity venous thrombosis is becoming more common because of the frequent use of indwelling catheters. When the catheters are excluded malignancy is the commonest predisposing factor.

The administration of intravenous solution and dialysis operations in renal failure played a great role in increasing the incidence of the upper limb phlebitis. As in the leg, the thrombosed veins of the upper limb may give off pulmonary emboli.

This study focuses light on the principle application of the duplex ultrasound in detection of deep venous thrombosis of the upper limb.

The value of duplex examination is discussed and a comparison with other modalities of examination as venography is also focused upon to highlight the benefits of duplex in that subject.

Chapter 1

Anatomy

Anatomy of Veins of the Upper Limb

Veins are conveniently grouped as superficial and deep, but these are widely interconnected. The superficial veins are subcutaneous in the superficial fascia; deep veins accompany arteries among the muscles of the limb. Both groups have valves, which are more numerous in the deep veins (Williams et al., 1989).

Superficial Veins of the Upper Limb

Superficial veins include the cephalic, basilic, median cubital, antebrachial veins and their tributaries.

Dorsal digital veins pass along the sides of fingers, joined by oblique branches; they unite from the adjacent sides of digits into three dorsal metacarpal veins, which form a dorsal venous network over the metacarpus; this is joined laterally by

a dorsal digital vein from the radial side of the index finger and both dorsal digital veins of the ullex and is prolonged proximally as the cephalic vein (Williams et al., 1989).

Medially, a dorsal digital vein from the ulnar side of minimus joins the network, which drains proximally into the basilic vein. A vein often connects the central parts of the network to the cephalic near mid-forearm. Palmar digital veins connect to the dorsal by oblique inter-carpal veins passing between metacarpal heads; they also drain to a plexus superficial to the palmar aponeurosis, extending over both thenar and hypothenar regions (Fig. 1)(Williams et al., 1989).

The Cephalic Vein

The Cephalic vein commonly formed over the anatomical snuff box, curves proximally from the radial end of the dorsal plexus round the forearm's radial side to its ventral aspect, receiving veins from both aspects. Distal to the elbow, a branch, the median

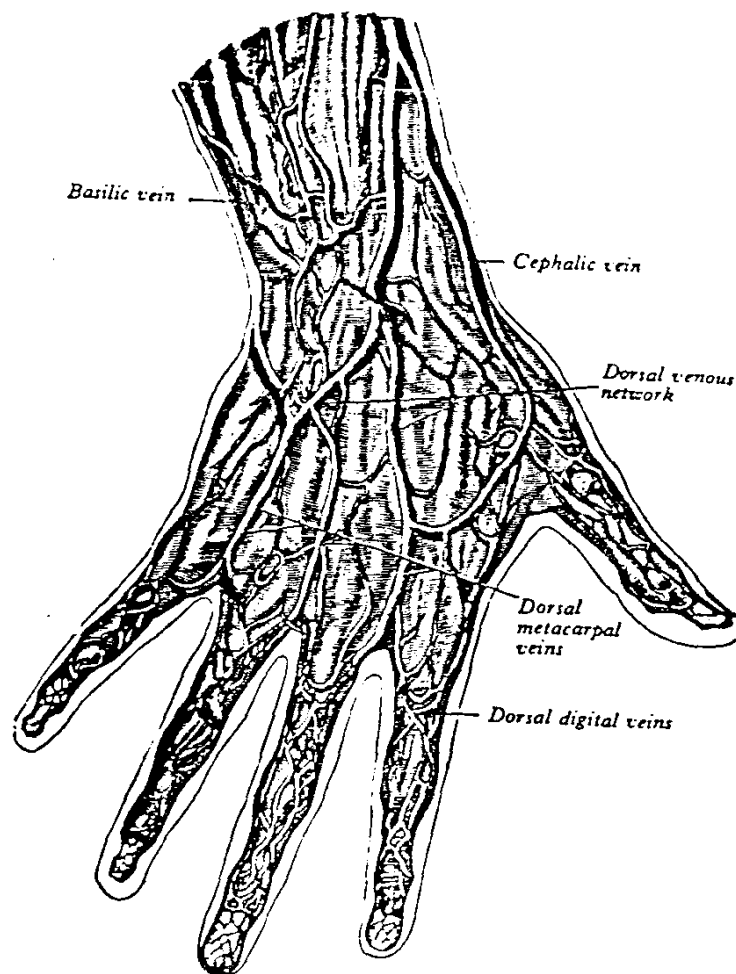


Fig. (1) Veins of the dorsum of the hand

cubital vein joined by a ramus from the deep veins, diverges proximally to reach the basilic vein. The cephalic ascends in front of the elbow superficial to a groove between the brachio-radialis and biceps, crosses superficial to the lateral cutaneous nerve of the forearm, ascends lateral to the biceps and between pectoralis major and deltoid, where it adjoins the deltoid branch of the thoraco-acromial artery. Entering the infraclavicular fossa to pass behind the clavicular head of pectoralis major, it pierces the clavi-pectoral fascia, crosses the axillary artery and joins the axillary vein just below the clavicular level. It may connect with the external jugular by a branch anterior to the clavicle (Williams et al.,1989).

Sometimes, the median cubital vein is large, transferring most of blood from the cephalic to the basilic vein, the proximal cephalic vein, then being absent or much diminished.

An accessory cephalic vein, arising in a dorsal forearm plexus or from the ulnar side of the dorsal venous network in the hand, joins the cephalic distal

to the elbow. It may spring from the cephalic proximal to the carpus and rejoins it later. A large oblique vein often connects the basilic vein dorsally in the forearm (Fig. 2)(Williams et al., 1989).

The Basilic Vein

The basilic vein begins medially in the hand's dorsal venous network, ascending postero-medially in the forearm and inclining forwards to the anterior surface distal to the elbow. Joined by the median X cubital vein, it ascends superficial to and between the biceps and pronator, teres, filaments of the medial cutaneous nerve of the forearm pass here, in front of veins. The basilic vein ascends medial and perforates the deep fascia about midway in the arm, continuing medial to the brachial artery to the lower border of the teres major, there becoming the axillary vein (Fig.5)(McMinn, 1990).