ROLE O

ROLE OF COLOUR DOPPLER IN DIAGNOSIS
OF RENAL ARTERY STENOSIS

ESSAY

SUBMITTED IN PARTIAL FULFILLMENT FOR MASTER DEGREE OF RADIODIAGNOSIS

BY
HABIBA TAREK AHMED Helmy
(M.B.B.CH.)

54

UNDER SUPERVISION OF

DR. MOHAMED ZAKI EL HEDEK

ASSISTANT PROFESSOR OF RADIODIAGNOSIS
DEPARTMENT OF RADIODIAGNOSIS
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

DR. MERVAT TAWFIK MOHAMED

LECTURER OF RADIODIAGNOSIS
DEPARTMENT OF RADIOLAGNOSIS
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

1997

707



Acknowledgment

I would like to express my deepest gratitude to Dr. MOHAMED 'ZAKI EL HEDEK, Assisstant professor of Radiodiagnosis, Ain Shams university, for his wise guidance and valuable supervision.

I would like to record my utmost appreciation to **Dr. MERVAT TAWFIK MOHAMED**, lecturer of Radiodiagnosis, Ain Shams university, for her expert guidance, continuous help and encouragment.



List of figures

Number	Subject	Page
1.	Course and relations of renal artery	3
2.	Segments of kidney	4
3.	Branches of renal artery	5
4.	Segmental arteries	6
5.	Corrosion cast of postcrior Segmental artery of kidney	8
6.	Renal arteriogram	9
7.	Accessory renal arteris	10
8.	Renal artery with primary intimal hyperplasia	15
9.	Renal artery with medial hyperplasia	16
10.	Renal artery dysplasia	17
11.	Aortogram	18
12.	Perimedial fibroplasia of Renal artery	18
13.	Aliasing problem	25
14.	Normal Renal artery frequency spectrum	27
15.	Coronal scan through LV.C and aorta	32
16.	Transverse plane through renal vessels	33
1 7.	Normal intra renal arterial Doppler signals	35
18.	Normal Renal artery Doppler signals	36
19.	CASE 1: Right Renal artery stenosis	37
20.	CASE 2: Normal and tardus - parvus Doppler waveform from Segmental arteries	38
21.	CASE 3: Tardus - parvus waveform distal to sever stenosis	39
22.	CASE 4: Three Doppler tracings with varying degrees of stenosis	40
23 .	CASE 5: Right Renal artery sever stenosis	41
24 .	CASE 6: Left Renal artery moderat stenosis	42
25.	CASE 7: Doppler spectral pattern of Renel artery of moderate to sever stenosis	43
2 6.	CASE 8: Doppler tracings from right kidney of hypertensive woman	44
27.	CASE 9: Doppler waveform from hilum of right kidney of hypertensive man	45



28.	CASE 10: Normal Doppler tracings of both kidneys of	46
	hypertensive man	
29 .	Normal low pulsatility tenal artery Doppler spectrum	48
30.	Doppler signals show spectral window in systole	49
31.	Normal Doppler wave of renal artery	50
32 .	77 77 77	50
33.	Abnormal Doppler waveform	51
34.	Doppler waveform from aorta and main renal artery	58
	List of Tables	
Number	Subject	Page
1.	Distribution of Doppler parameters based on degree of	54
	stenosis in hypertensive patients	
2.	Threshold values for renal artery stenosis in	55

hypertensive patients



CONTENTS

- I. Introduction.
- II. Anatomy of renal arteries.
- III. Pathology of renal artery stenosis.
- IV. Doppler principle.
- V. Methods of examination.
- VI. Illustrative (demonstrative) cases.
- VII. Discussion.
- VIII. Summary and Conclusion.
- IX. References.
- X. Arabic Summary



Role of Color Doppler in Diagnosis of Renal Artery Stenosis



Introduction

The incidence of renal artery stenosis as a cause of hypertension varies from 1% to 10% of the hypertensives, although the most widely used figureure is less than 1%.

Radionuclide renography has been proposed as a screening tool for renal artery stenosis with a sensitivity of between 75% and 100%. However it suffers from low specificity and similar appearance may be recorded in chronic renal disease of non-vascular aetiology.

Arteriography is clearly the investigation of choice in renal artery stenosis and it is by this technique that all other non invasive studies must be judged. (Robertson et al. 1995)

Doppler ultrasound is a suitable method for evaluation of renal artery stenosis. Considering the whole population of hyperstensives the number of patients likely to be helped by surgery or angioplasty is likely to be small and therefore any screening test employed to identify renal artery stenosis should be non-invasive and cheap.

Doppler U/S equipment fulfils these criteria absolutely. (Victor et al. 1996.

Aim of the work

The aim of our study is to evaluate the Doppler ultrasound as a screening, non invasive technique for diagnosis of renal artery stenosis.