

RENOVASCULAR HYPERTENSION

(RVH)

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Definition:

- High blood pressure secondary to Renal artery stenosis (Ischaemia)
- Clinical practice – Retrospective diagnosis if blood
- pressure improves after repair of renal artery stenosis

What does improvement mean?

Previously elevated blood pressure becomes normal without anti-hypertensive medication / Less medication is required to control blood pressure.

- * Hypertension need not be cured to make the diagnosis of RVH

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How severe must stenosis be to cause RVH?

- Some authors – 50% lumen narrowing
- Perfusion pressure in large arteries preserved until lumen is reduced by 70%
- Over / under estimation obstruction to blood flow depends on length and configuration of stenosis
(two-dimensional view of three dimensional process)

• What can cause the stenosis?

- Any process that narrows a main renal artery.
- Stenosis of branch / accessory artery.

What Pathology causes most of stenosis?

1. Fibromuscular dysplasia (young women)
2. Atherosclerosis
3. Neurofibromatosis
4. Radiation fibrosis
5. Extrinsic compression
6. Embolism
7. Congenital anomaly
8. Takayasu's disease

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What is critical in RVH?

- Degree to which stenosis interferes with perfusion (ischaemia) and stimulates renin release.
- Significant stenosis = 50% / more

Pathophysiology

1. Decreased perfusion → Renin release

- Renin promotes conversion Angiotensinogen to angiotensin I
- Angiotensin converting enzyme converts Angiotensin I to Angiotensin II (A II)
- * A-II 1. = potent vasoconstrictor
 2. increase release of Aldosterone (salt and water retention)
 3. Sustained hypertension

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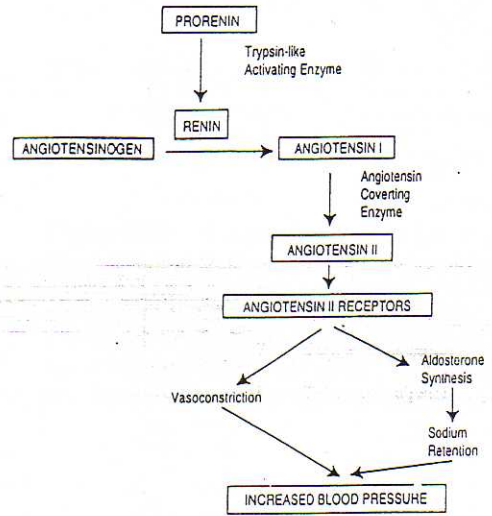
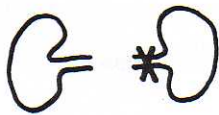


FIGURE 1 Renin-angiotensin-aldosterone axis.

Goldblatt – Animal model (rat)



Two kidney one clip

Fig 2

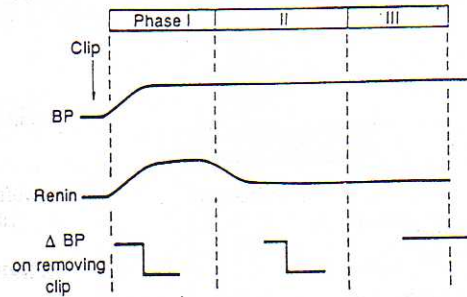


FIGURE 2 Phases of renovascular hypertension in the two-kidney, one-clip Goldblatt rat.

TABLE 2
Diagnostic and Screening Tests for
Renovascular Hypertension

Conventional renal arteriography
Intravenous digital subtraction renal angiography
ACE inhibitor-stimulated peripheral renin activity
ACE inhibitor-stimulated renography
Duplex ultrasound
Magnetic resonance angiography

Diagnostic Tests

1. Retro spective diagnosis – after correction
2. Gold standard = Renal Arteriography
3. Intravenous digital subtraction angiography

Treatment

- Aim: 1. Correct or decrease blood pressure – less drugs
2. Preserve Renal function

Methods

- Revascularization
- Percutaneous transluminal angioplasty (PTA)
- Renal artery stenting
- Medical treatment

$\frac{2-2}{2} = \frac{0-0}{2} = 0$

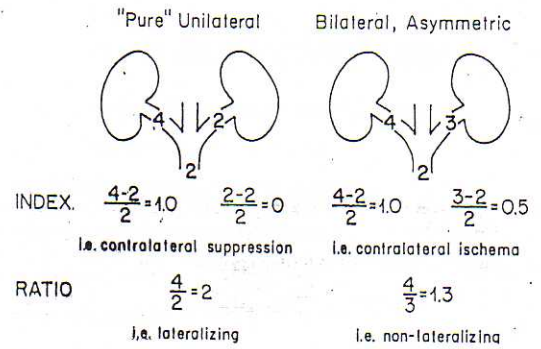


Figure 9.12. A representation of the renal vein renin levels in patients with "pure" unilateral renovascular hypertension (left) and bilateral but asymmetrical renovascular hypertension (right). The *index* = renal vein renin – systemic renin/systemic vein renin. The *ratio* = ischemic renal vein renin/contralateral renal vein renin.

