

Heelkundige behandeling van pathologieën van endocriene organen:

ENDOCRIENE HYPERTENSIE



Prof Dr Randon C
Thoracale en Vasculaire Heelkunde
UZ Gent



Prevalentie

Secundaire oorzaak	Prevalentie ^a	Prevalentie ^b
Obstructief slaapapnoesyndroom	>5-15%	>30%
Renale parenchymale ziekte	1,6-8,0%	2-10%
Arteria renalis stenose	1,0-8,0%	2,5-20%
Primair aldosteronisme	1,4-10%	6-23%
Schildklierlijden	1-2%	1-3%
Cushing syndroom	0,5%	<1%
Fechromocytoom	0,2-0,5%	<1%
Coarctatio aortae	<1%	<1%



▶ 28,6% hypertensie bij volwassenen (USA)

▶ 15% secundair

▶ Hypertensie kan de initiële klinische presentatie zijn van 15 endocriene afwijkingen

Table 1. Endocrine Causes of Hypertension

Etiology

Adrenal-dependent causes	
1.	Pheochromocytoma and sympathetic paraganglioma
2.	Primary aldosteronism
3.	Hyperdeoxycorticosteronism
a.	Congenital adrenal hyperplasia
i.	11 β -Hydroxylase deficiency
ii.	17 α -Hydroxylase deficiency
b.	Deoxycorticosterone-producing tumor
c.	Primary cortisol resistance
4.	Cushing syndrome
Apparent mineralocorticoid excess/11 β -hydroxysteroid dehydrogenase deficiency	
1.	Genetic
2.	Acquired
a.	Licorice or carbenoxolone ingestion
b.	Cushing syndrome
Parathyroid-dependent causes	
1.	Hyperparathyroidism
Pituitary-dependent causes	
1.	Acromegaly
2.	Cushing syndrome
Secondary hyperaldosteronism	
1.	Renovascular hypertension
Thyroid-dependent causes	
1.	Hypothyroidism
2.	Hyperthyroidism
Complex effects	
1.	Obstructive sleep apnea

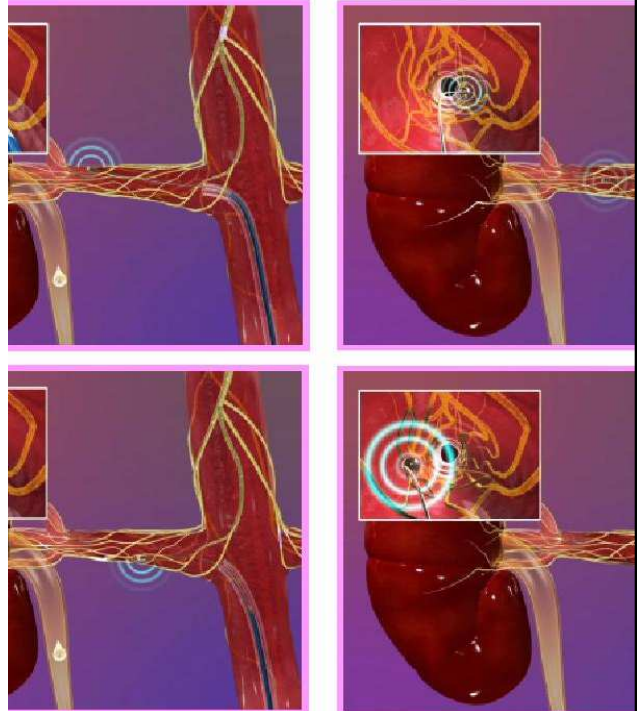
1. Art renalis stenose en arteria renalis denervatie

- ▶ ARAS
- ▶ Fibromusculaire dysplasia

- ▶ Normale nierarteries

Art renalis denervatie

- ▶ RF / US ablatie
- ▶ Op 6 plaatsen



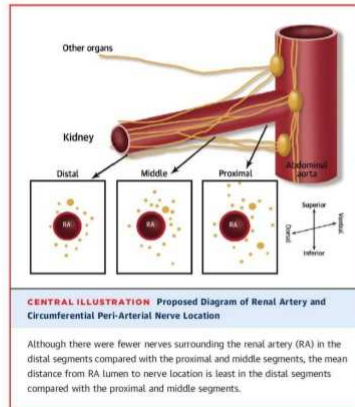
Resultaten

- ▶ low quality evidence voor verandering renale en cardiovasculaire functie
- ▶ moderate quality evidence dat RR “niet” veranderd
- ▶ low quality evidence voor bradycardia postop
- ▶ Nieuwe studies nodig



Cochrane Database Syst Rev, 2017 Feb 21;2:CD011499.

New insights on renal nerve anatomy



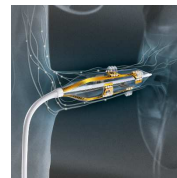
Sakurai et al., J Am Coll Cardiol 2014;64:635-43



At the same time three major clinical trials will soon be reported.

- ▶ 1. The **Symplicity Spyral** clinical trial programme¹⁵ is studying the use of a multielectrode renal denervation system in patients with uncontrolled hypertension in the absence (SPYRAL HTN OFF-MED; n=100, NCT02439749) and presence (SPYRAL HTN ON-MED; n=100, NCT02439775) of antihypertensive drugs. These trials use the change in systolic blood pressure measured by 24-hour blood pressure from baseline to three months as an efficacy endpoint. The control groups receive sham treatment with renal angiography.
- ▶ 2. The **RADIANCE-HTN** (NCT02649426) trial compares ultrasonic renal denervation (Paradise®System; ReCor Medical, Palo Alto, CA, USA) to a sham procedure with the primary endpoint change in average daytime ambulatory systolic blood pressure from baseline to two months. Two cohorts are being investigated, namely patients without antihypertensive medication (SOLO, n=146) and patients treated with a fixed-dose triple antihypertensive drug regimen (TRIO, n=146). **REQUIRE** (NCT02918305, n=140) is designed to evaluate resistant hypertension patients on standard of care medication in Japan and Korea.
- ▶ 3. **REDUCE HTN: REINFORCE** (NCT02392351, n=100) studies the performance of the bipolar renal denervation system (Vessix™; Boston Scientific, Marlborough, MA, USA) over eight weeks compared to the sham effects of percutaneous renal angiography on mean reduction in daytime ambulatory systolic blood pressure in patients not treated with antihypertensive medication.

There is widespread consensus that renal denervation can affect blood pressure in specific settings but there is similarly universal appreciation that the clinical evidence in support of renal denervation in resistant hypertension is mixed.



vessix



2. Atherosclerotic renal artery stenosis (ARAS)

- ▶ In a population of veterans with hypertension referred for coronary angiography more than 20% of patients were found to have hemodynamically significant RAS (>70%)
- ▶ The current AHA/ACC guidelines and the SCAI Appropriate Use Criteria for renal artery stenting recommend PTRAS for patients with :
 - ischemic nephropathy if they have progressive chronic kidney disease (CKD) due to bilateral ARAS (Class IIa, LOE B)
 - progressive CKD with ARAS to a solitary functioning kidney (Class IIa, LOE B)
 - CKD with unilateral ARAS (Class IIb, LOE C).
- ▶ Major contemporary clinical trials such as the Cardiovascular Outcomes for Renal Artery lesions (CORAL) and Angioplasty and Stenting for Renal Atherosclerotic lesions (ASTRAL) have failed to show significant benefit of revascularization over medical management in controlling blood pressure and preserving renal function

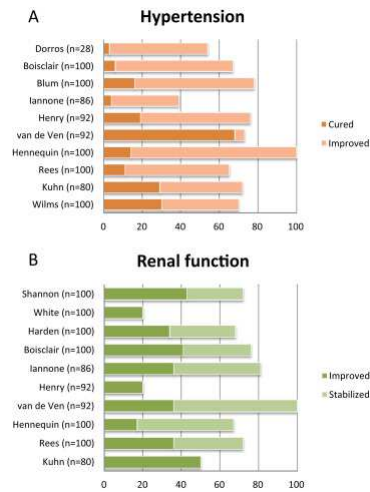


Revascularization, usually by percutaneous angioplasty with stenting, is reasonable in patients who have a **high likelihood** of benefitting from intervention. The following scenarios identify such patients:

- ▶ A short duration of blood pressure elevation prior to the diagnosis of renovascular disease, since this is the strongest clinical predictor of a fall in blood pressure after renal revascularization
- ▶ Failure of optimal medical therapy to control the blood pressure
- ▶ Intolerance to optimal medical therapy (eg, deterioration of renal function during antihypertensive drug therapy)
- ▶ Recurrent flash pulmonary edema and/or refractory heart failure
- ▶ Otherwise unexplained progressive renal insufficiency



ARAS na stenting



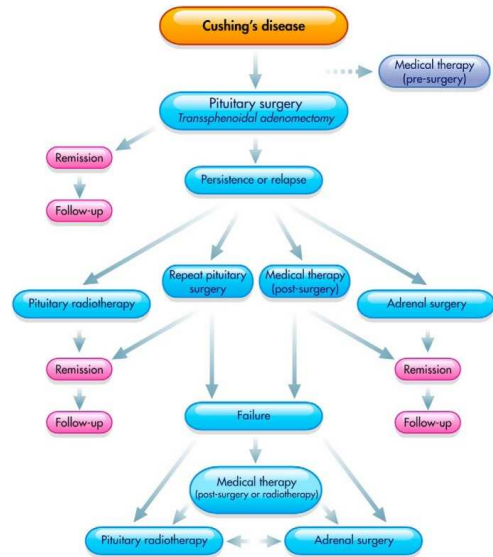
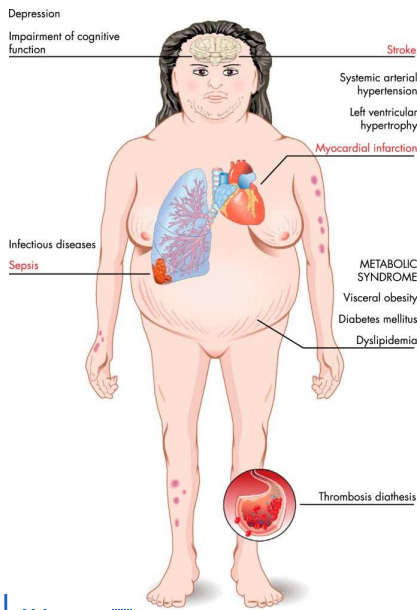
Complicaties (5-15%)

- ▶ Punctie plaats hematoom (lies , arm)
- ▶ Art renalis dissectie
- ▶ Art renalis trombose of perforatie (heelkunde)
- ▶ Contrast probleem
- ▶ Cholesterol embolen (45-60%)
- ▶ Dood

- ▶ Longoedeem
- ▶ AMI
- ▶ Aneurysma a renalis (pseudo)

3. Cushing syndrome

- ▶ Hypofyse chirurgie
- ▶ Bilateraal bijnierresectie : laparoscopisch > open



First Author, Year (Ref.)	No. of Patients	Follow-Up, yr, no.	Approach	Resolution Rate, %	Reoperation Rate, %	Time to Reoperation, mo	Postoperative Mortality, %	Postoperative Hospitalization, %	Complications, %
Fernandez-Chaz, 1996 (10)	6	M:3 F:3	L.A.	100	0	na	0	R:2.0	13.3 ^a
Chapuis, 1997 (11)	10	NA	L.A.	100	0	na	0	R:4.4, M:4	10
Ferrero, 1997 (12)	3	NA	L.A.	100	0	na	0	R:3.4	25 ^a
Leck, 1998 (13)	4	R:3 F:1	L.A.	100	0	na	0	R:4.5	0
Alcala, 1999 (14)	23	NA	L.A.	100	0	na	4.8	R:3.17	21.7 ^a
Nagamine, 2000 (15)	44	R:12 F:32	O.A.	95.5	4.8	NA	0	NA	0
Yoshida, 2004 (16)	12	R:4 F:8	L.A.	100	0	na	0	R:2.0, M:2.7	0
Prasad, 2004 (17)	10	NA	L.A.	100	0	na	0	M:1.0, M:2.0	20
Mohr, 2009 (18)	42	M:31 F:11	O.A./L.A.	100	0	na	0	M:1.0, M:2.0	7.1 ^a
Chen, 2008 (19)	42	NA	L.A.	100	4.8	NA	0	R:3.2	20.5 ^a
Smith, 2009 (20)	40	R:24 F:16	L.A.	100	0	na	0	R:3.04	17.5
Shih, 2010 (21)	43	R:14 F:29	O.A.	100	0	na	0	R:3.27	13.0
Tajima, 2011 (22)	6	R:5 F:1	L.A.	NA	NA	NA	11.1	NA	44.4
Palau, 2011 (23)	35	NA	L.A.	NA	NA	NA	0	R:4.12	NA
Chen, 2014 (24)	34	R:18 F:16	L.A.	100	0	na	0	R:3.0	0 ^a
Kapur, 2015 (25)	17	R:10 F:7	L.A.	100	0	na	0	R:2.02, M:1.9	23.5 ^a
Total	719	R:348 F:371	L.A.	97.8%	R:0.12	M:0.4	R:0.01	M:0.10	R:0.46

Table 8.

Results of the Studies Evaluating the Outcome of Bilateral Adrenalectomy in Patients With CD

0-25% complications
0-6% mortality



Endocr Rev. 2015 Aug; 36(4): 385-486. Published online 2015 Jun 11. doi: 10.1210/er.2013-1048

Table 2.
Main complications of laparoscopic adrenalectomy. ³

Intraoperative
1. Bleeding due to vascular injury
2. Organ injury:
- Liver
- Kidney
- Spleen
- Pancreas
- Bowel
- Diaphragm
- Specimen fragment
Postoperative
1. Bleeding
2. Wound
3. Infectious
4. Cardiovascular
5. Pulmonary
6. Gastrointestinal
7. Urinary
8. Thromboembolic
9. Endocrine



Outcome

- ▶ 60% geen hypertensive medicaite nodig

4. Feochromocytoom en paraganglioma

Pheochromocytomas and paragangliomas (PPGLs) are rare neuroendocrine chromaffin-cell tumors that usually produce catecholamines and arise from the adrenal medulla (80% to 85%) or from paravertebral ganglia of the sympathetic chain (15% to 20%),

CLASSIFICATIONS

- ADRENAL
 - PHEOCHROMOCYTOMA
- EXTRA-ADRENAL
 - BRANCHIOMERIC
 - AORTICOPULMONARY
 - CORONARY
 - INTERCAROTID
 - JUGULOTYMPANIC
 - LARYNGEAL
 - NASAL
 - ORBITAL
 - PULMUNARY
 - SUBCLAVIAN
 - INTRAVAGAL
 - AORTICOSYMPATHETIC
 - VISEROAUTONOMIC

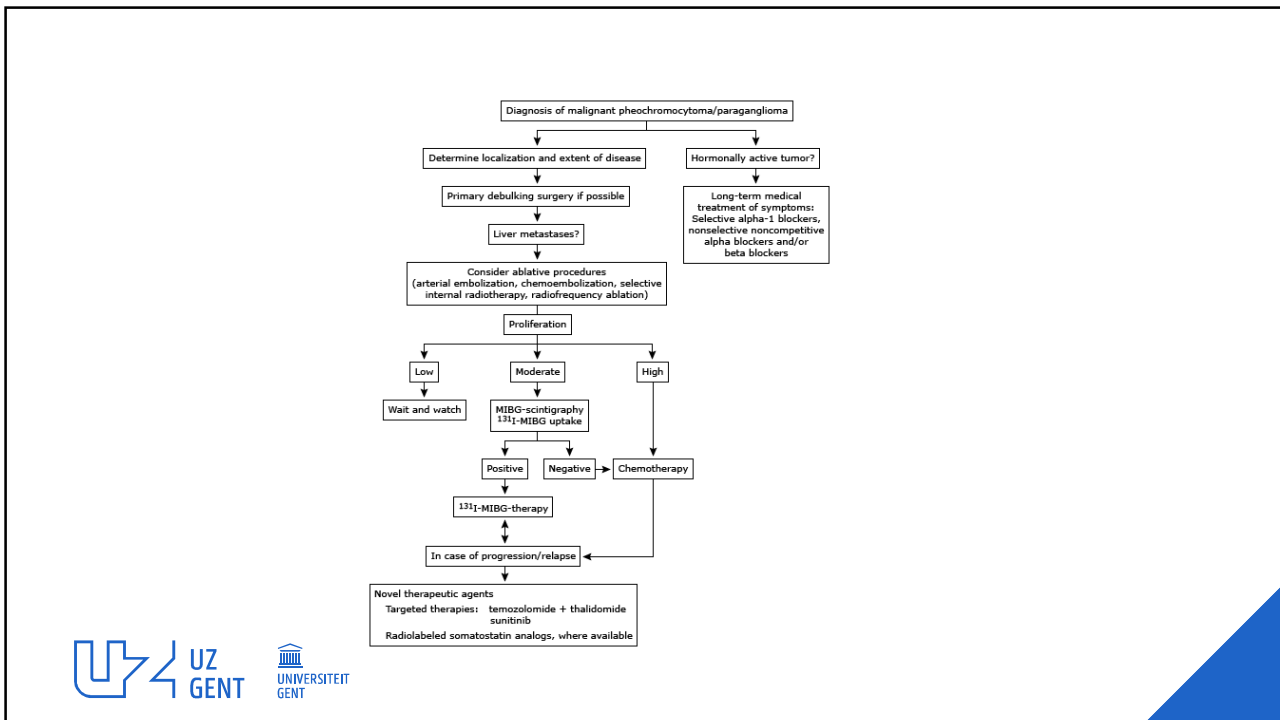
Feochromocytoom en paraganglioma

- ▶ Voorkomen : 2- 8/1 000 000
- ▶ 4% van bijnier massa
- ▶ 10% feochromocytomen maligne
- ▶ 20-25% paraganglioma maligne
 - 2-4 % maligniteit als thv hoofd/hals
 - 4-6% glomus caroticum tumors maligne
 - 10-19% maligniteit als paraganglioma langs N Vagus
- ▶ Unilateraal bijnier
- ▶ Kan bilateraal in bijnier
- ▶ Maligne?

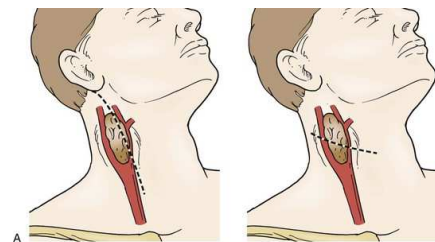


- ▶ Familiale paraganglioma meer kans op maligniteit (mutatie in de B subunit van het succinaat dehydrogenase (*SDHB*) gen)
- ▶ •Bij MEN II zijn 3 tot 5 percent van de feochromocytomen / paragangliomen maligne
- ▶ 5j overleving van gemetastaseerd feochromocytoom / paraganglioom varieert afh van de studie tussen 12 en 84%
- ▶ Er zijn geen curatieve behandelingen behalve heelkundige resecties , ook van metas





- ▶ 10% van de feochromocytomen worden gevonden als incidentaloma
- ▶ Sympathische ganglia vnl gelokaliseerd prevertebraal and paravertebraal in de thorax , abdomen, en pelvis.



Bijnierresectie voor feochromocytoom

- ▶ Voorkeur voor laparoscopisch (zeker als < 6 cm)
- ▶ 10% complicaties
- ▶ 16% recidief als benigne , bijna 50% recidief als maligne
- ▶ Tot zelfs na 53j mogelijkheid van meta

- ▶ Evt selectieve catheterisatie preop

- ▶ 80% postop geen hypertensie



Complicaties bijnierresectie voor feochromocytoom

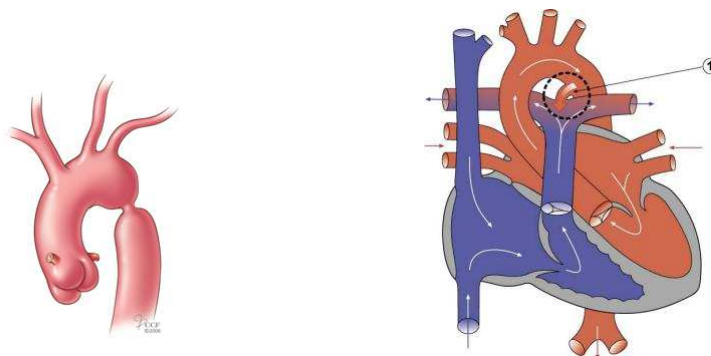
- ▶ Open heekunde 32% complicaties
- ▶ 25% peroperatieve hypertensive (zeker als niet goed voorbereid)
- ▶ Minder complicaties als laparoscopisch en kortere opname



Management — Treatment options for hypertensive crises include intravenous sodium nitroprusside, phentolamine, or nicardipine.

- ▶ •Sodium nitroprusside is an ideal vasodilator for intraoperative management of hypertensive episodes because of its rapid onset of action and short duration of effect. It is administered as an intravenous infusion at 0.5 to 5.0 mcg/kg of body weight per minute and adjusted every few minutes for target blood pressure response; to keep the steady-state thiocyanate concentration below 1 mmol/L, the rate of a prolonged infusion should be no more than 3 mcg/kg per minute.
- ▶ •Phentolamine is a short-acting, nonselective alpha-adrenergic blocker available in lyophilized form in 5 mg vials. An initial test dose of 1 mg is administered and, if necessary, followed by repeat 5 mg boluses or continuous infusion. The response to phentolamine is maximal in two to three minutes after a bolus injection and lasts 10 to 15 minutes.
- ▶ •Nicardipine can be started at an infusion rate of 5 mg/hour and titrated for blood pressure control (the infusion rate may be increased by 2.5 mg/hour every 15 minutes up to a maximum of 15 mg/hour).
- ▶ Other complications
 - ▶ •Cardiac arrhythmias should be managed with lidocaine (50 to 100 mg intravenously) or esmolol (50 to 200 mcg per kg per minute intravenously).
 - ▶ •Postoperative hypotension can be avoided by adequate fluid replacement and hypoglycemia (which can occur in 10 to 15 percent of patients due to removal of catecholamine suppression of insulin secretion [56]) by glucose infusion. After tumor removal, catecholamine secretion should fall to normal in approximately one week.

5. Coarctatio aorta



6. Schildklierlijden

- ▶ Hyperthyreoidisme
- ▶ hypothyreoidisme