





INCIDENTAL ADRENAL MASS ON COMPUTED TOMOGRAPHY

- The adrenal 'incidentaloma' is a finding made serendipitously on a CT scan performed for an indication other than the evaluation of the adrenal glands
- Incidental adenomas are found in up to 4-5% of CT scans [28](#), [30](#)
- Adenomas are the most common cause of an adrenal lesion accounting for 75%, followed by myelolipoma 6% and haematoma 4% [30](#)
- Does not include patients with a known malignancy
- Increased incidence with age
- Further investigation of an incidentally found adrenal mass will depend on clinical suspicion based on patient characteristics and clinical background
- Imaging phenotype and mass size are the two major predictors of malignancy in incidental adrenal lesions [1](#)
- Myelolipomas, haematomas and cysts can be accurately diagnosed on their specific imaging appearance
- A study of patients with no known malignancy and no suspicion for a hyperfunctioning adrenal mass found that imaging provided a specific diagnosis in 87% of all adrenal masses, of which 62% were diagnostic on the original CT [30](#)

HORMONAL SCREENING FOR INCIDENTAL ADRENAL MASSES

- Subclinical Cushing syndrome has been shown to be the most common hormonal abnormality in patients with incidental adrenal masses found on CT. A multi-centre trial of 1096 cases of adrenal incidentaloma showed that 85% were non-functioning, 9% secreted cortisol and caused subclinical Cushing Syndrome, 4% were pheochromocytomas (less than half caused hypertension) and 2% were aldosteronomas. [24](#)
- All patients with an adrenal incidentaloma should have a urinary free cortisol and measurement of plasma-free metanephrines or 24-hr urinary catecholamines. In addition, measurement of serum potassium and plasma aldosterone concentration-plasma renin activity ratio should be done in hypertensive patients. [25,26,29](#)
- Patients with subclinical Cushing Syndrome have been shown to have adverse cardiovascular profiles with increased waist:hip ratios, systolic and diastolic hypertension, impaired fasting glucose measurements, elevated total cholesterol, triglycerides and fibrinogen and more developed carotid atherosclerotic disease on duplex scanning compared with age, weight and sex controls. [27](#)





MASS GREATER THAN 4cm

- In a study that involved 887 patients who had adrenal incidentalomas, a diameter greater than 4cm was shown to have 90% sensitivity for the detection of adrenocortical carcinoma but low specificity [17](#)

IMAGING CHARACTERISTICS

- Primary imaging modality for the characterisation of an adrenal mass is a CT scan [1](#)
- Unenhanced CT attenuation values are useful in distinguishing between benign and malignant lesions [4,5](#)
- Contrast enhanced CT can be performed if non-contrast CT is indeterminate, with adrenal adenomas usually exhibiting greater washout of contrast material than do adrenal non-adenomas. There is some debate about the "cut-off point", one study used a value of 60% washout at 15 minutes, reporting a sensitivity and specificity of 88% and 96% respectively. [8,22](#)
- Follow up CT can be used to monitor lesions that are at low risk of malignancy based on their small size and absence of known primary malignancy. [3](#)
- Lesions that are unchanged or smaller in size on CT are left alone, whereas lesions that increase in size are excised. [3](#)

FEATURES SUGGESTIVE OF A BENIGN ADRENAL MASS

- Unenhanced CT attenuation of less than 10 Hounsfield Units (71% sensitivity and >99% specificity) [6-8,19-21](#)
- Rapid CT contrast enhancement and washout greater than 60% at 15 minutes on imaging (98% sensitivity and specificity of 92%) [22](#)
- The presence of negative pixels on contrast enhanced CT was found to have 100% specificity and sensitivity of 52.9% that the lesion was benign in one study [23](#)

FEATURES SUGGESTIVE OF SUSPICIOUS LESION

- Unenhanced CT attenuation of greater than 10 Hounsfield Units [6-8,19-21](#)
- Rapid CT contrast enhancement and washout less than 60% at 15 minutes on imaging [22](#)





SUGGESTED FOLLOW-UP OF A BENIGN LESION

- The optimal frequency and duration of follow-up for patients with adrenal masses remains uncertain. A suggested regimen includes repeat imaging at 6, 12 and 24 months to ensure the mass is not progressing in size. [16](#)
- It is also suggested that patients undergo annual biochemical screening for four (4) years as some lesions that were non-functioning at diagnosis, may subsequently become active [9](#)

SUGGESTED MANAGEMENT OF A SUSPICIOUS LESION

- The further management of a lesion that is suspicious for a malignancy is based on local expertise as well as due consideration of the clinical circumstance; [16](#)
 - 1. Biopsy Greater than 90% accurate for malignant lesions when adequate sample available [12,13](#)
 - Most use-full in patients with known extra-adrenal malignancies who are risk of adrenal metastases (particularly carcinoma of the lung, pancreas, liver and stomach) [14,15](#)
 - Potential complications include pneumothorax, bleeding, tumour tracking, infection, adrenal abscess formation
 - 2. Surgery
 - 3. Close Follow-Up (repeat imaging at 3 months)

FURTHER IMAGING MODALITIES

- Magnetic Resonance Imaging (Chemical Shift)
 - Useful for imaging of CT-indeterminate adrenal lesions
 - 93% accuracy for differentiating benign from malignant adrenal masses [10](#)
 - Benign adrenal cortical adenomas lose signal on out-of-phase images but appear relatively bright on in-phase images [11](#)
- NP59 Scintigraphy
 - Adrenal gland scintigraphy using ¹³¹I-6b-iodomethyl-norcholesterol (NP59) can be used to characterise adrenal masses on the basis that benign adrenal adenomas take up cholesterol esters, while malignant lesions do not [1,5](#)
 - Limited Availability
- Positron Emission Scintigraphy
 - PET may have a role in evaluating adrenal lesions in patients with proven extra-adrenal malignancy but there is limited evidence for its utility in differentiating between benign and malignant primary adrenal masses [15,18](#)



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Website

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