INVESTIGATION AND FOLLOW-UP OF THE INCIDENTAL ADRENAL MASS

It is not uncommon for a mass in the adrenal gland to be identified on a CT or MRI scan of the abdomen that has been performed for another indication. Such lesions are known as adrenal ‘incidentalomas’. They are present in up to 10% of adults and the prevalence increases with age.

Aetiology
85% of adrenal incidentalomas are non-functioning adrenal adenomas. The remainder are made up of a rag-bag of abnormalities including metastatic tumours, functional tumours of the adrenal cortex (secreting cortisol, aldosterone or androgens), nodular hyperplasia, phaeochromocyтомas, primary adrenocortical carcinomas, cysts, hamartomas and other rare disorders including granulomatous infiltrations.

Investigations
The two key issues to be resolved in a patient with an adrenal incidentaloma are:

- Is it benign or malignant?
- Is it functional?

Assessing Malignant Potential
CT and MRI are equally effective in assessing the malignant potential of an adrenal mass. The following parameters are useful in assessing malignant potential:

- **Size**: for lesions > 4cm, there is 90% sensitivity in detecting adrenocortical carcinomas; but specificity is poor in that only ~ 25% of lesions this size are malignant. In general terms though, the larger the lesion, the greater the malignant potential.

- **Configuration**: homogeneous and smooth lesions more likely to be benign; heterogenous and irregular lesions more likely to be malignant. The presence of metastatic lesions elsewhere increases risk of malignancy, but note that two-thirds of adrenal incidentalomas in patients with cancer are benign.

- **Presence of Lipid**: adenomas are usually lipid rich. Thus, if on an *unenhanced* CT, the lesion has an attenuation of <10 Hounsfield Units (HU), it is highly likely to be benign (specificity 98%). MR signal drop out on chemical shift imaging is also a marker of high lipid content. However, 30% of adenomas do not contain sufficient lipid and would be classified as suspicious or indeterminate if this criterion were used alone.

- **Enhancement**: Benign lesions demonstrate rapid washout of contrast, whereas malignant lesions tend to retain contrast. On CT, a delayed (15 min) attenuation of <30 HU, washout >60% and relative washout of >40% are all features of benign disease.
Assessment of Functionality

Patients with an adrenal incidentaloma are almost by definition asymptomatic. *Size of the lesion is not a guide to the likelihood of functionality*. Therefore, clinical signs and symptoms of glucocorticoid, mineralocorticoid and catecholamine excess and, in women, androgen excess should be sought. If present, then clearly the individual should be referred to an endocrine clinic; if not present, then clinical judgement is required as to whether an endocrine referral is made or baseline investigations performed. As a bare minimum, however, catecholamine excess should always be excluded prior to any planned surgical removal of an adrenal mass. Remember also that there are some rare familial syndromes (e.g. Multiple Endocrine Neoplasia, von Hippel Lindau syndrome) which are associated with adrenal neoplasms, and so a family history should be sought.

When patients are referred to an endocrine clinic, it is almost inevitable that investigations to assess hormone excess will be performed. The following investigations would typically be performed:

- 24 urine collection for metanephrines
- Overnight dexamethasone suppression test (for sub-clinical Cushing’s)
- Serum testosterone, DHEAS and androstenedione (in women)

Investigations for mineralocorticoid excess should also be considered in individuals with hypertension (see Investigation of Mineralocorticoid Excess protocol).

Management

The algorithm below should be followed, but clearly is not meant to be followed slavishly. Thus, for example, observation of a >5cm lesion, with radiologically features of an adenoma, may be appropriate in an elderly individual in whom surgery would be relatively high risk. Similarly, some lesions have clear-cut benign features, such as an adrenal myolipoma, and could be left alone irrespective of the age of the patient and the size of the mass.

Adrenalectomy is usually possible laparoscopically and should be undertaken by a member of the endocrine surgery team. Adrenal biopsy cannot reliably distinguish an adenoma from an adrenocortical carcinoma. CT-guided biopsy may be useful when an unusual diagnosis is suspected (either by clinical findings or on CT appearances) and in patients with known extra-adrenal malignancy, in whom it may be important to determine whether an adrenal mass is a metastatic lesion or not.

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Incidentally Discovered Adrenal Mass. Consider referral to Endocrinology

Clinical and/or biochemical evidence of hormone excess

YES  Adrenalectomy

NO

Lesion < 3cm and radiologically ‘benign’

No further imaging

Lesion 3-5cm OR lesion <3 cm and radiologically ‘indeterminate’

If radiologically ‘benign’ – repeat scan in 12 months
If no change, then no further imaging

If radiologically ‘indeterminate’, but probably benign – repeat scan in 6 months
If no change, one further scan in 12 months

Lesion >5cm

Consider adrenalectomy or biopsy

If radiologically ‘indeterminate’, but suspicious – consider repeat scan in 3 months or biopsy/adrenalectomy

If no change, liaise with radiologist regarding subsequent scanning interval