

Follow-up of Adrenal Incidentalomas – are we overdoing it?

Follow-up of 145 patients from a single centre

Dr E Austin, Dr B Miller, Sister L. Shepherd, Dr A Bates
Department of Diabetes and Endocrinology, Heart of England Foundation Trust



INTRODUCTION

The core objectives when investigating adrenal incidentalomas are to exclude functionality and malignancy via radiological and biochemical investigations. Routinely, these lesions are then followed-up with repeat investigations in case of progression as per the AACE guidelines¹.

Several studies have suggested that this is unnecessary given the low conversion rates to functional or malignant lesions². Current guidelines for monitoring adrenal incidentalomas are therefore under review by the ESE³.

Following research presented in 2015, we suggested that in asymptomatic patients with imaging features consistent with a benign adenoma, further investigation was unrewarding⁴. To support this conclusion, further radiological data for the same cohort was collected to assess the frequency of conversion of presumed benign lesions to malignant ones.

METHODS

145 consecutive cases of adrenal incidentalomas referred to Endocrinology from January 2013 to January 2015 were reviewed.

Data collected:

- Age, gender, blood pressure
- Imaging results of first and last scan
- Biochemistry results (plus repeat results if available)
- Time interval between first and last scan
- Diagnosis
- Outcome

Cohort Demographics:

- Mean age 65 years (21-95)
- M:F = 51:94

The incidentalomas were then categorised as benign adenomas if they were <20HU (on plain CT) and <4cm in size; all others were deemed indeterminate or malignant.

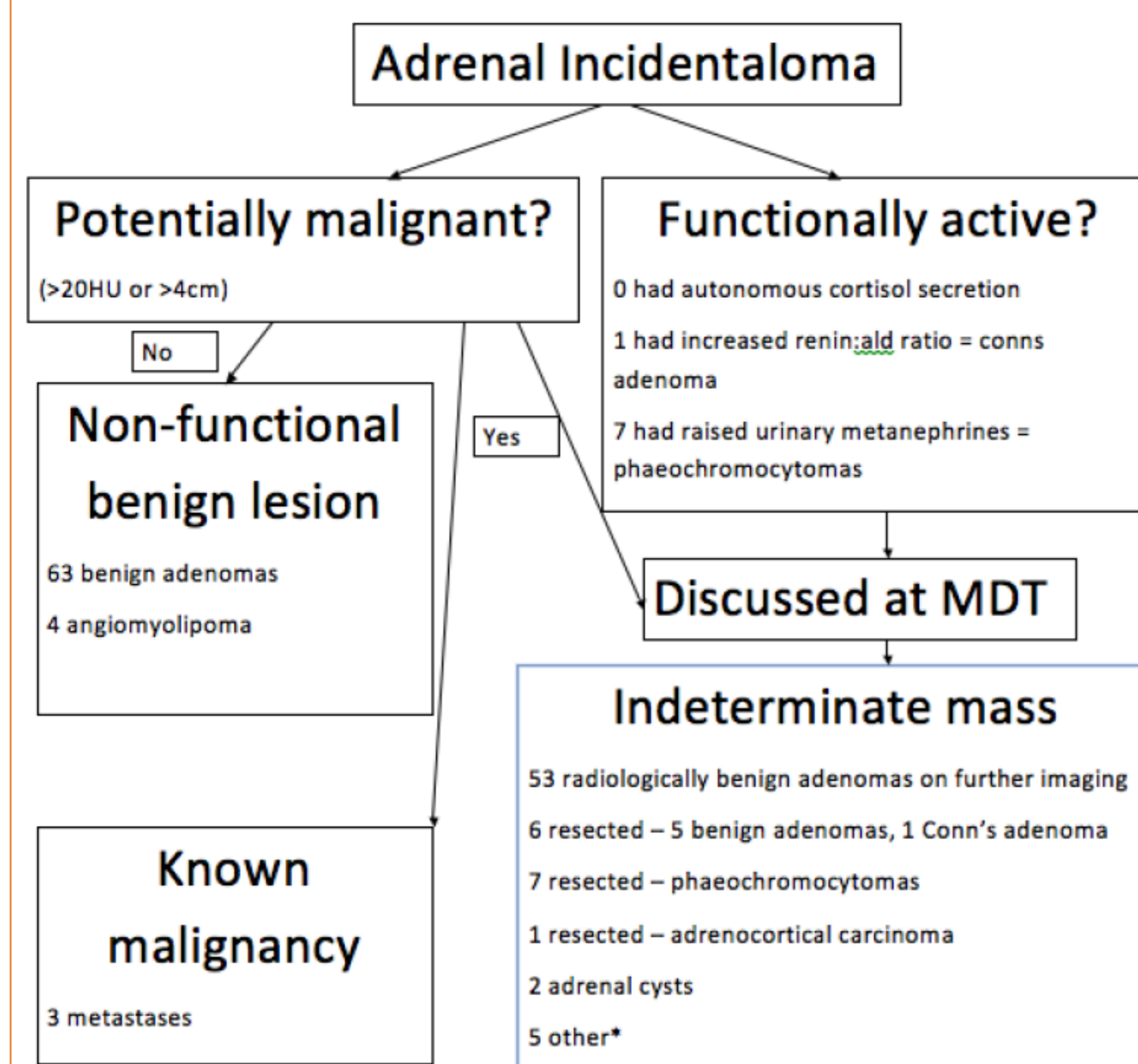
OBJECTIVES

This study was performed to:

- Review the incidence of functional or malignant lesions detected as adrenal incidentalomas
- Assess the frequency of progression of a benign adenoma to a potentially malignant lesion
- For those patients with repeat biochemistry, to review the risk of becoming functional when initially non-functional

RESULTS

Figure 1: Summary of outcomes, diagram modified from ESE Guideline³



What was the frequency of progression of benign to possibly malignant lesions?

- Of the 63 patients whose detection scan was characteristically benign, 45 (71%) had further imaging at a median time interval of 13 months. None had progressed.
- 74 patients had indeterminate detection scans. Of these, 65 (88%) had repeat scans at a median time interval of 8 months. The outcomes of the indeterminate lesions are detailed below:
 - 59 patients had benign adenomas, of which 58 had repeat scans (1 was resected as >7cm) at a median time interval of 7 months. 54 were characterised as benign on repeat imaging. 2 became larger and 2 remained indeterminate so these were resected and histologically confirmed as benign adenomas.
 - 7 patients had phaeochromocytomas – 2 of which were resected based on the initial scan, and the remaining 5 were resected following further characteristic imaging. 2 had increased in size at a median time interval of 8 months. All had raised urinary metanephrines.
 - There was a solitary ACC which had not increased in size after 10 months, however was characteristically malignant on further imaging.
- All 3 metastatic lesions had increased in size on repeat imaging at a median time interval of 5 months. All patients had a known history of malignancy.

Do non-functional benign lesions progress to functional lesions?

- In the cohort of benign lesions (see figure 2), mean duration of time from initial scan to latest biochemistry was 5 months, during which 99% of incidentalomas remained non-functional.
- 28 patients (22%) in this subgroup had repeat biochemistry; none progressed from non-functional to functional lesions.

10HU vs 20HU when defining benign lesions?

Based on the data collected, the sensitivity and specificity of using either 10HU or 20HU on a plain film CT to define a lesion as benign are shown in figure 3. No malignant lesions had a density of less than 20HU.

Figure 3: Sensitivity and specificity values

Plain film CT density	Sensitivity	Specificity
<10HU	100%	41%
<20HU	100%	52%

Figure 2: Summary of diagnoses

Benign	
Adrenal adenoma	121 (83.4%)
Angiomyolipoma	4 (2.8%)
Adrenal cyst	2 (1.4%)
Conn's adenoma	1 (0.7%)
Malignant	
Phaeochromocytoma	7 (4.8%)
ACC	1 (0.7%)
Metastases	3 (2.1%)
Other*	

*1 ganglioneuroma, 1 sarcoma, 3 not for follow-up

CONCLUSIONS

- There is no evidence that radiologically benign lesions progress to functional or malignant lesions. Therefore, it is not necessary to repeat imaging if the detection scan is considered benign.
- For indeterminate images, if repeat imaging is characteristic of a benign adenoma, no further imaging is needed.
- A cut off of <20HU on plain CT to define benign lesions may improve specificity without compromising sensitivity, therefore avoiding excessive investigation of benign lesions.

REFERENCES

- Zeiger M.A et al. American Association of Clinical Endocrinologists and American Association of Endocrine Surgeons Medical Guidelines for Management of Adrenal Incidentalomas, AACE Guidelines 2009
- Cawood T. J et al. Recommended evaluation of adrenal incidentalomas is costly, has high false-positive rates and confers a risk of fatal cancer that is similar to the risk of the adrenal lesion becoming malignant; time for a rethink? European Journal of Endocrinology. 2009; 161: 513-527
- Fassnacht et al. ESE and ENSAT guidelines on adrenal incidentaloma v.21.12.2015
- Austin E et al 2015. Outcome of patients with adrenal incidentalomas: an analysis of 145 patients from a single centre. Presented at Society for Endocrinology BES 2015, Edinburgh, UK. *Endocrine Abstracts*