

Editorial Note

Adrenal Incidentalomas or Adrenomas: The NIH state-of-the-science conference statement

In this issue of *Hormones*, Dr. Dimitrios Linos has written a comprehensive review on adrenal incidentalomas, for which he proposes the more economical term "adrenomas"^{1,2}. The management of these incidentally discovered, common masses has many controversies stemming from the fact that a minute proportion of them can be malignant². There are two known common conditions that have been associated with adrenomas: The visceral fat or insulin resistance syndrome which affects approximately 25 percent of the population over 40 years, and the carrier state of 21-hydroxylase deficiency which affects approximately one in 30 individuals^{3,4}. The remaining causes of adrenal tumors are either unknown, germ line or somatic mutations of genes involved in adrenal growth⁴.

There are three simple rules that clarify the management of a small percentage of these tumors³:

First, **all hormonally active tumors** are removed regardless of their size or imaging appearance.

Second, **all malignant- looking tumors on CT or MRI imaging** are removed, regardless of their size.

Third, **all unexplained tumors in young individuals (less than 20 years)** are also removed, as the overwhelming majority of the benign incidentalomas are seen in adults over 40 years of age.

As a result of the remaining controversy, the National Institutes of Health convened a State-of-the-Science conference in 2002 on this particular issue. The summary of the results of this conference is cited below. We would like to note that the tumor size controversy remains, even after the NIH Conference. However, one should know that as the diameter of a tumor decreases, the likelihood of it being malignant decreases to infinitesimal levels. On the other hand, laparoscopic surgery of the adrenals has decreased the immediate surgical impact of the open adrenalectomy and has lowered the size threshold for removal. The correct approach would be to present the patient with the real data and allow him or her make the decision, understanding that people have differing abilities to tolerate insecurity regarding their health.

1. Linos D, 1989 Adrenoma: A better term than incidentaloma. *Surgery* 105: 456.
2. Latronico AC, Chrousos GP, 1997 Adrenocortical Tumors (Extensive Personal Experience Article). *J Clin Endocrinol Metab* 82: 1317-1324.
3. Bornstein SR, Stratakis CA, Chrousos GP, 1999 Adrenocortical Tumors: Recent Advances in Basic Concepts and Clinical Management. *Ann Intern Med* 130: 759-771.
4. Merke DP, Bornstein SR, Avila N, Chrousos GP, 2002 Future Directions in the Study and Management of Congenital Adrenal Hyperplasia Due to 21- Hydroxylase Deficiency. *Ann Internal Med* 136: 320-334.
5. Koch C, Pacak K, Chrousos GP, 2002 The molecular pathogenesis of hereditary and sporadic adrenocortical and adrenomedullary tumors. *J Clin Endocrinol Metab* 87: 5367-5384.

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**NATIONAL INSTITUTES OF HEALTH
STATE-OF-THE-SCIENCE CONFERENCE STATEMENT**

Management of the Clinically Inapparent Adrenal Mass ("Incidentaloma")

February 4-6, 2002

This two-and-a-half-day-of-the-science conference on Management of the Clinically Inapparent Adrenal Mass ("Incidentaloma") was convened on February 4-6, 2002, to explore and assess the current knowledge regarding adrenal incidentalomas, so that health care providers and the general public can make informed decisions about this important public health issue.

After a day-and-a-half of expert presentations and questions and public discussion by members of the panel and the audience of interested attendees on incidental adrenal masses, an independent, non-Federal panel weighed the evidence and drafted a statement that was presented on the third day of the conference. Expert presentations and the panel's statement addressed the following questions:

The panel's draft statement was posted to the Consensus Program Web site: <http://consensus.nih.gov> on Wednesday, February 6, 2002.

BASED ON AVAILABLE SCIENTIFIC EVIDENCE, WHAT IS THE APPROPRIATE EVALUATION OF A CLINICALLY INAPPARENT ADRENAL MASS?

The patient with a clinically inapparent adrenal mass revealed by an imaging study requires a complete history and physical examination, a biochemical evaluation for hormone excess, and possible additional radiologic studies. The goal is to determine whether the patient has pheochromocytoma, subtle glucocorticoid excess, primary aldosteronism (Conn syndrome), or virilizing or feminizing tumors.

CONCLUSIONS

- The management of clinically inapparent adrenal masses is complicated by limited studies of incidence, prevalence, and natural history, including the psychologic impact on the patient who is informed of the diagnosis. Improvements in the resolution of abdominal imaging techniques combined with increased use of abdominal imaging suggest that the prevalence of clinically inapparent adrenal masses will continue to escalate. The low prevalence of adrenal cortical carcinomas and the relatively low incidence of progression to hyperfunction call into question the advisability of the current practice of intense, long-term clinical followup of this common condition.
- All patients with an incidentaloma should have a 1-mg dexamethasone suppression test and a measurement of plasma-free metanephrines.
- Patients with hypertension should also undergo measurement of serum potassium and plasma aldosterone concentration/plasma renin activity ratio.
- A homogeneous mass with a low attenuation value (less than 10 HU) on CT scan is likely a benign adenoma.
- Surgery should be considered in all patients with functional adrenal cortical tumors that are clinically apparent.

- All patients with biochemical evidence of pheochromocytoma should undergo surgery.
- Data are insufficient to indicate the superiority of a surgical or nonsurgical approach to manage patients with subclinical hyperfunctioning adrenal cortical adenomas.
- Recommendations for surgery based upon tumor size are derived from studies not standardized for inclusion criteria, length of followup, or methods of estimating the risk of carcinoma. Nevertheless, patients with tumors greater than 6 cm usually are treated surgically, while those with tumors less than 4 cm are generally monitored. In patients with tumors between 4 and 6 cm, criteria in addition to size should be considered in making the decision to monitor or proceed to adrenalectomy.
- The literature on adrenal incidentaloma has proliferated in the last several years. Unfortunately, the lack of controlled studies makes formulating diagnostic and treatment strategies difficult. Because of the complexity of the problem, the management of patients with adrenal incidentalomas will be optimized by a multidisciplinary team approach involving physicians with expertise in endocrinology, radiology, surgery, and pathology. The paucity of evidence-based data highlights the need for well-designed prospective studies.
- Either open or laparoscopic adrenalectomy is an acceptable procedure for resection of an adrenal mass. The choice of procedure will depend upon the likelihood of an invasive adrenal cortical carcinoma, technical issues, and the experience of the surgical team.
- In patients with tumors that remain stable on two imaging studies carried out at least 6 months apart and do not exhibit hormonal hypersecretion over 4 years, further followup may not be warranted.