

Management of Incidental Pituitary Findings on CT, MRI, and ¹⁸F-Fluorodeoxyglucose PET: A White Paper of the ACR Incidental Findings Committee

SA-CME

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Abstract

The ACR Incidental Findings Committee presents recommendations for managing pituitary findings that are incidentally detected on CT, MRI and ¹⁸F-fluorodeoxyglucose PET. The Pituitary Subcommittee, which included radiologists practicing neuroradiology and an endocrinologist, developed this algorithm. The recommendations draw from published evidence and expert opinion and were finalized by informal iterative consensus. Algorithm branches successively categorize pituitary findings on the basis of imaging features. They terminate with an ascertainment of an indolent lesion (with sufficient confidence to discontinue follow-up) or a management recommendation. The algorithm addresses most, but not all, pathologies and clinical scenarios. The goal is to improve the quality of care by providing guidance on how to manage incidentally detected pituitary findings.

Key Words: pituitary lesion, Rathke’s cleft cyst, incidental, pituitary adenoma

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OVERVIEW OF THE ACR INCIDENTAL FINDINGS PROJECT

The core objectives of the incidental findings project are to (1) develop consensus on patient characteristics and

imaging features that are required to characterize an incidental finding, (2) provide guidance to manage such findings in ways that balance the risks and benefits to patients, (3) recommend reporting terms that reflect the

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This study was approved by the institutional review board of the institution that provided the sonograms. Dr Hoffman is a consultant to Ascendis, Ono, GeneScience, Genexine, Sandoz, and Versartis. Dr Wintermark is a member of the advisory board of GE-BFL and holds equity in More Health and Magnetic Insight. Dr Pandharipande received research funding from the Medical Imaging and Technology Alliance, outside the submitted work. Dr Berland receives consulting fees from Nuance Communications. Dr Seidenwurm is a consultant for RASMG Medical Group, The Alliance, HSAG, the National Quality Forum, ACR. All other authors have no conflicts of interest related to the material discussed in this article.

level of confidence regarding a finding, and (4) focus future research by proposing a generalizable management framework across practice settings.

THE CONSENSUS PROCESS: MANAGEMENT OF INCIDENTAL PITUITARY FINDINGS

The current report presents the ACR Incidental Findings Committee's (IFC) recommendations regarding incidental pituitary findings detected on CT, MRI, or ^{18}F -fluorodeoxyglucose (FDG) PET. The process of developing this algorithm included naming a subcommittee chair, who appointed four radiologists (who interpret neuroimaging examinations) and an endocrinologist to the Pituitary Subcommittee. The subcommittee then developed and gained consensus on preliminary recommendations. The subcommittee used published evidence as its primary source. When evidence was not available, the subcommittee invoked the collective expertise of the team. The preliminary algorithm underwent review by additional members within the IFC, including the Body Commission chair and the IFC chair. The revised algorithm and corresponding white paper draft were submitted to additional ACR stakeholders to gain input and feedback. Consensus was obtained iteratively after successive reviews and revisions. After completion of this process, the algorithm and white paper were finalized.

The IFC's consensus processes meet policy standards of the ACR. However, they do not meet any specific, formal national standards. This algorithm and set of recommendations does not represent policy of the ACR Practice Guidelines or the ACR Appropriateness Criteria. Our consensus may be termed "guidance" and "recommendations" rather than "guidelines," which has a more formal definition.

ELEMENTS OF THE FLOWCHARTS: COLOR CODING

The algorithm is summarized in two flowcharts. Within each flowchart, yellow boxes indicate using or acquiring clinical data (eg, lesion size), green boxes describe recommendations for action (eg, follow-up imaging), and red boxes indicate that imaging workup or follow-up may be terminated. To minimize complexity, each algorithm addresses most, but not all, imaging appearances and clinical scenarios. Radiologists should feel comfortable deviating from the algorithm in circumstances that are not represented in the algorithm, on the basis of the specific imaging appearance of the finding in question and patient characteristics: the algorithm content must be

viewed as recommendations and should not be considered as "standard of care."

NATURE AND SCOPE OF THE PROBLEM

Incidental pituitary lesions are common, estimated to occur in 11% to 23% of the population in postmortem studies [1-3]. The observed prevalence depends on the imaging protocol. They are detected in 0.1% to 1.2% of patients undergoing MRI head examinations [4-6] and in 10% of normal subjects on MRI pituitary examinations [7].

The two most common pathologies responsible for incidental pituitary lesions are Rathke's cleft cysts and pituitary adenomas. Other diagnoses are rare and include pituitary metastases, infarctions, hemorrhage, epidermoid cysts, and abscesses. In addition, pituitary glands can be heterogeneous on imaging, resulting in small "pseudolesions" [8-12]. Suprasellar and parasellar masses, such as craniopharyngioma and meningioma, may mimic pituitary lesions when large. The literature includes a combination of studies that encompass all these diagnoses (pituitary incidentalomas) or focus specifically on solid lesions that are assumed to be pituitary adenomas. Lesions are categorized as macro- versus microadenomas (or incidentalomas) using a 10-mm size threshold.

Macroincidentalomas of the pituitary gland that are large enough to cause compression and invasion of surrounding structures require endocrine or neurosurgical consultation. However, they are rarely incidentally detected. In consecutive postmortem cohorts, fewer than 1% of incidental pituitary lesions were >10 mm [3]. Incidental pituitary lesions are usually small at imaging. In 100 normal patients, a total of 10 incidental pituitary lesions were detected on MRI pituitary examinations, all measuring 3 to 6 mm [7]. In retrospective surgical cohorts, the proportion of pituitary macroincidentalomas will be higher, reflecting referral bias.

When left untreated, a small percentage of patients will have pituitary adenomas that grow or hemorrhage. This can lead to hypopituitarism or visual field deficits (from compression of optic nerves or chiasm) or ophthalmoplegia (from invasion into the cavernous sinus or orbital apex). Even fewer will have subclinical hypersecreting pituitary adenomas that could result in morbidity if left undiagnosed in the long term. Misperceptions about the likelihood of these rare outcomes commonly prompt unnecessary and repeated examinations for patients with incidental pituitary lesions, leaving them vulnerable to anxiety, avoidable medical expenses, and risks associated with unnecessary treatment.

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