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Computed Tomography / Tomodensitométrie

Managing Incidentalomas Safely: Do Computed Tomography Requisitions Tell Us What We Need to Know?

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Abstract

Purpose: Technological advancements and the ever-increasing use of computed tomography (CT) have greatly increased the detection of incidental findings, including tiny pulmonary nodules. The management of many ''incidentalomas'' is significantly influenced by a patient's history of cancer. The study aim is to determine if CT requisitions include prior history of malignancy.
Methods: Requisitions for chest CTs performed at our adult tertiary care hospital during April 2012 were compared to a cancer history questionnaire, administered to patients at the time of CT scan. Patients were excluded from the study if the patient questionnaire was incomplete or if the purpose of the CT was for cancer staging or cancer follow-up.
Results: A total of 569 CTs of the chest were performed. Of the 327 patients that met inclusion criteria, 79 reported a history of cancer. After excluding patients for whom a history of malignancy could not be confirmed through a chart review and excluding nonmelanoma skin cancer, dysplasia, and in situ neoplasm, 68 patients were identified as having a history of malignancy. We found 44% (95% confidence interval [0.32-0.57]) of the chest CT requisitions for these 68 patients did not include the patient's history of cancer. Of the malignancies that were identified by patient questionnaire but omitted from the clinical history provided on the requisitions, 47% were malignancies that commonly metastasize to the lung.
Conclusions: A significant number of requisitions failed to disclose a history of cancer. Without knowledge of prior malignancy, radiologists cannot comply with current guidelines regarding the reporting and management of incidental findings.

Résumé

Objectif : Les progrès technologiques et l'utilisation toujours plus répandue de la tomodensitométrie (TDM) ont permis d'améliorer grandement la détection des constatations fortuites, y compris de minuscules nodules pulmonaires. La gestion de nombreux « fortuitomes » dépend largement des antécédents de cancer du patient. L'étude vise à déterminer si les demandes de TDM comprennent les antécédents de malignité.
Méthodes : Les demandes correspondant aux TDM thoraciques effectuées à notre hôpital de soins tertiaires aux adultes en avril 2012 ont été comparées à un questionnaire sur les antécédents de cancer soumis aux patients au moment de l'examen de TDM. Les patients dont le questionnaire était incomplet ou dont la TDM visait la stadification ou le suivi d'un cancer ont été exclus.
Résultats : Un total de 569 TDM thoraciques ont été effectuées. Sur les 327 patients qui correspondaient aux critères d'inclusion, 79 avaient des antécédents de cancer. Après avoir exclu les patients pour lesquels il a été impossible de confirmer les antécédents de malignité par un examen du dossier ainsi que ceux qui souffraient de cancers de la peau autre qu'un mélanome, de dysplasie et d'une tumeur in situ, 68 patients ont été définis comme ayant des antécédents de malignité. Nous avons découvert que 44 % (intervalle de confiance de 95 % [de 0,32 à 0,57]) des demandes de TDM thoracique pour ces 68 patients ne comprenaient pas leurs antécédents de cancer. Sur les malignités déclarées dans les questionnaires des patients, mais omises dans les antécédents cliniques fournis avec les demandes, 47 % étaient des malignités qui métastasent couramment au poumon.
Conclusions : Un nombre important de demandes n'indiquaient pas les antécédents de cancer. S'ils ne connaissent pas les malignités antérieures, les radiologistes ne peuvent pas se conformer aux lignes directrices sur la déclaration et la gestion des constatations fortuites.

Key Words: Guidelines; Incidental; Medical error; Pulmonary nodules; Reporting; Requisitions

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Diagnostic imaging requisitions with insufficient, inaccurate, or illegible clinical information is a long-standing and well-documented concern [1–3]. Several studies have shown that incomplete or absent clinical history reduces sensitivity for detecting disease and that accurate focused clinical information on requisitions does not deteriorate specificity [4–6]. The impact on medical error is clear; radiologists are better able to detect and interpret imaging findings when aware of the clinical context. But how do requisitions affect reporting of asymptomatic imaging findings? Do radiologists have enough past medical history information to safely interpret asymptomatic incidental findings?

In 2012 an estimated 4.4 million computed tomography (CT) scans were performed in Canada (126 per 1000 people), nearly double the number of such exams performed in 2003 [7]. The growth of CT coupled with continuous improvements in image quality and spatial resolution has resulted in a marked increase in incidental detection of asymptomatic abnormalities. For example, large studies of CT colongraphy have revealed incidental extracolonic findings in 41%-69% of exams [8,9].

Incidental pulmonary nodules present a particular challenge. Up to 60% of adults will have at least 1 noncalcified pulmonary nodule detectable on chest CT [10–12]. Although lung nodules are a common benign finding, they are also a common manifestation of metastatic disease.

In asymptomatic smokers and former smokers there is a malignant rate of less than 1% for patients with pulmonary nodules measuring 4 mm or less (Figure 1) [13–15]. However, similar-sized pulmonary nodules discovered in patients with pre-existing extrapulmonary cancers have been shown to have a malignant rate of 28% (Figure 2) [16]. Unfortunately tiny benign lung nodules may appear identical to early metastatic disease. Under the Mayo Clinic model the most important factor in determining the pretest probability of malignancy in small pulmonary nodules is a history of extrathoracic cancer, which independently produces an odds ratio of 3.8 [17].

The effect of prior malignancy on the significance of incidental findings is not limited to lung nodules. The American College of Radiology published a white paper on incidental abdominal CT findings to provide guidance to radiologists and to help curb unnecessary work-up. The initial step in the algorithm regarding many incidental lesions of uncertain etiology, including adrenal lesions, depends on whether the patient is known to have a malignancy [18].

Given the increased identification of incidentalomas and the critical role of prior cancer history in determining the significance of these lesions, it is important that radiologists are aware of prior cancer history when reporting CTs. The objective of this study is to determine the percentage of chest CT requisitions that have not included a patient's previous history of cancer.

Methods

We reviewed requisitions for CTs of the chest performed at our adult tertiary care hospital during the period April 1-30, 2012. The month of April was selected as a convenience sample. CTs of the chest were identified by electronic search of the picture archiving and communication system (PACS) using variables "study description includes chest" and "modality equals CT." The resultant electronic work list with cases identified by accession number served as the study group.

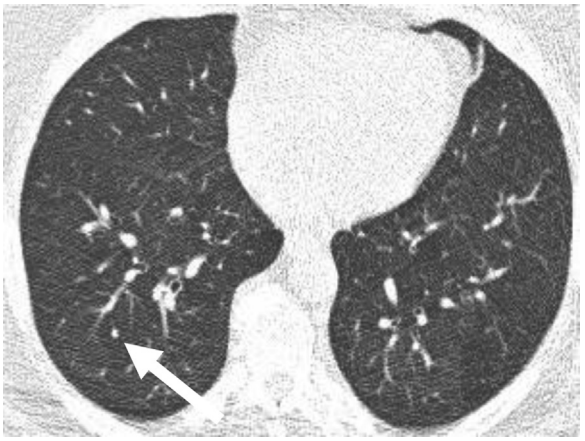

Figure 1. Incidental nodule requiring no surveillance. Axial computed tomography (CT) of the lung demonstrates a 3-mm nodule (arrow) in a 56-year-old woman without a history of cancer. This is a benign nodule. Follow-up CT (not shown) was performed 1 year later for another reason and demonstrated no growth in the nodule.

Cases in the study group were reviewed directly on PACS. At our institution CTs are ordered through a paper requisition. This requisition is then scanned into PACS. We compared the CT requisition completed by the referring physician to information obtained directly from the patient by the CT technologist. Information from the patient was obtained as part of a routine demographic risk profiling tool used clinically in our Diagnostic Radiology Department. Technologists administer a short questionnaire immediately before every CT of the chest. The questionnaire responses are then scanned and appended to the patient's electronic radiology chart. One of the questions the patients are asked is whether they have ever had cancer. If the patient reports a history of cancer, the patient is then asked to identify the type of cancer.

Requisitions were excluded if the associated patient questionnaire had not been completed or if the requisition was illegible. Additionally, patients for whom the imaging was being conducted for the purpose of cancer staging were excluded from the study because any pulmonary nodules detected by these scans would not be incidental findings. All other CTs of the chest were included in the study.

Review of the electronic medical chart was performed for all patients who identified a history of cancer on the questionnaire but presented with requisitions that did not include this history. Pathology reports, discharge summaries, and clinic notes were used to verify the history supplied by the patient. Benign neoplasms (eg, uterine leiomyoma), dysplasia, and in situ neoplasm (eg, in the cervix) were not considered cancers for the purposes of this