Review Article

The blind spots on chest computed tomography: what do we miss

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Abstract: Chest computed tomography (CT) is the most frequently performed imaging examination worldwide. Compared with chest radiography, chest CT greatly improves the detection rate and diagnostic accuracy of chest lesions because of the absence of overlapping structures and is the best imaging technique for the observation of chest lesions. However, there are still frequently missed diagnoses during the interpretation process, especially in certain areas or "blind spots", which may possibly be overlooked by radiologists. Awareness of these blind spots is of great significance to avoid false negative results and potential adverse consequences for patients. In this review, we summarize the common blind spots identified in actual clinical practice, encompassing the central areas within the pulmonary parenchyma (including the perihilar regions, paramediastinal regions, and operative area after surgery), trachea and bronchus, pleura, heart, vascular structure, external mediastinal lymph nodes, thyroid, osseous structures, breast, and upper abdomen. In addition to careful review, clinicians can employ several techniques to mitigate or minimize errors arising from these blind spots in film interpretation and reporting. In this review, we also propose technical methods to reduce missed diagnoses, including advanced imaging post-processing techniques such as multiplanar reconstruction (MPR), maximum intensity projection (MIP), artificial intelligence (AI) and structured reporting which can significantly enhance the detection of lesions and improve diagnostic accuracy.

Keywords: Diagnostic imaging; blind spots; chest computed tomography (chest CT)

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Introduction

As the most traditional imaging method for diagnosing lung diseases, the chest radiograph is a two-dimensional projection that captures information from a three-dimensional volume, thereby leading to the superimposition of anatomical structures. Therefore, chest radiograph often leads to missed diagnosis of lesions. The common sites of undetected pulmonary nodules and disease, often referred to as "blind spots", are key teaching points of chest radiography for medical students and imaging beginners. The most common blind areas of chest radiographs include the apical area of lung, hilar area of lung, projection area after heart shadow, retrosternal space, subphrenic projection area (1,2). With the widespread increase in the use of chest computed tomography (CT), the importance

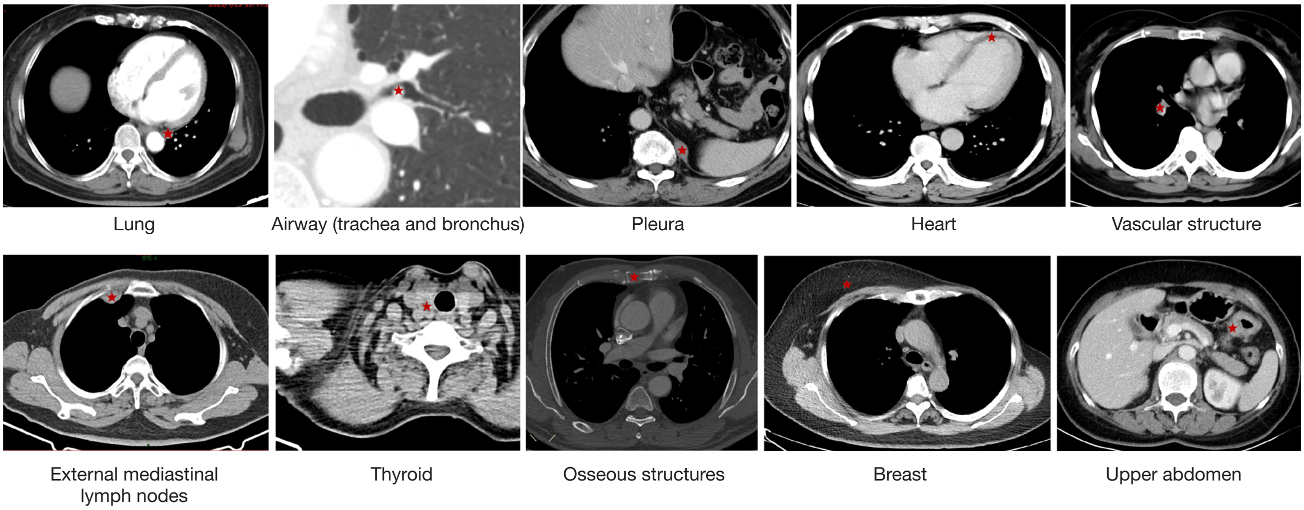

Figure 1 Summary of blind spots on chest CT (red star indicates the areas of common blind spots on chest CT). CT, computed tomography.

of chest radiography has gradually decreased. Because chest CT avoids anatomic overlap and improves spatial resolution, the performance of detecting chest lesions, especially pulmonary nodules, is significantly improved. In comparison to chest radiography, chest CT provides enhanced visualization and characterization of thoracic anatomy and abnormalities. Even low-dose CT screening is associated with a 20% reduction in lung cancer mortality compared with chest radiography (3), Therefore, chest CT examination has become increasingly common as the initial imaging modality in assessing patients with pulmonary symptoms, helping us increase the diagnostic accuracy of related diseases, such as pulmonary embolism and coronavirus disease 2019 (COVID-19) (4-6).

Despite its widespread clinical usefulness, the interpretation of chest CT scans still involves errors. In addition, chest CT images may possess inherent blind spots, leading to potential oversight of abnormalities. Certain errors, such as the failure to detect lung nodules indicative of early-stage lung cancer or the oversight of a pneumothorax necessitating immediate intervention, can have detrimental implications for patients. These types of errors frequently serve as the basis for medical malpractice lawsuits (7,8). Understanding the commonly overlooked findings of chest CT scans, their underlying causes, and the potential repercussions is crucial for devising strategies aimed at minimizing and addressing these errors.

The special features in this article discuss commonly missed blind spots on chest CT and provide actual examples of clinical significance. In addition, we present proposed solutions to effectively address these errors, thereby providing valuable support to radiologists in their clinical practice.

The blind spots on chest CT

The common blind spots on chest CT are summarized and illustrated in *Figure 1*. These blind spots are detailed in the following paragraphs.

Lung

Due to the presence of air, the lungs have a naturally good contrast, and the contrast of lung lesions is good. In contrast to chest radiography, CT scans provide enhanced visualization of pulmonary structures and abnormalities by eliminating the interference caused by overlapping structures. Nonetheless, despite these advantages, lung nodules on chest CT scans can still have a chance for being overlooked. Studies examining patients with surgically removed pulmonary nodules have reported that CT scans can fail to identify up to 27–47% of these nodules (9,10), in which inferior lobe nodules (73%) and ground glass nodules (91%) are the majority (11,12). Missing diagnosis of lung cancer and lung metastasis can have serious consequences for patients. Small metastatic tumors, in particular, are highly susceptible to being overlooked, thereby influencing the formulation of effective diagnostic and treatment strategies for the patients (*Figure 2*).

There are still areas within the pulmonary parenchyma that have been consistently identified as blind spots, where

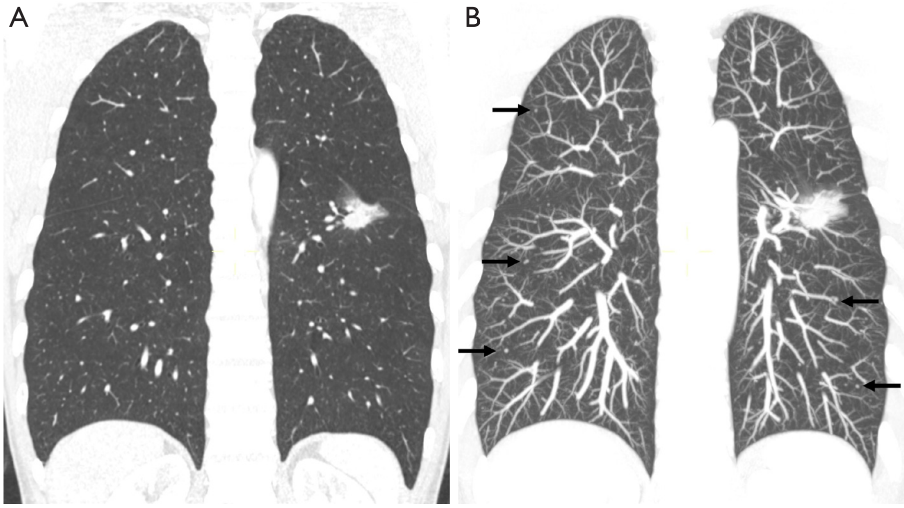

Figure 2 Example of lung lesions that are easily missed on chest CT. (A,B) A 52-year-old male with adenocarcinoma of the left lower lung lobe. (A) The radiologist reported the main lesion in the left lung but failed to identify multiple small pulmonary nodules, which are difficult to distinguish from cross-sections of blood vessels. (B) The use of MIP reconstruction enhanced the clarity of the visualization of small nodules (black arrows). Subsequently, follow-up of the pulmonary nodules confirmed metastasis. As there is contralateral metastasis, according to the 8th edition Lung Cancer Staging classification (13), it is classified as M1. CT, computed tomography; MIP, maximum intensity projection.

missed lesions are more frequently observed (14). The central areas within the pulmonary parenchyma, such as the perihilar and paramediastinal regions, are more prone to harbor missed lesions. It is reported that central lung cancers, including perihilar and para mediastinal lung regions are at higher risk of being overlooked (11,15). The perihilar area is affected by the pulmonary hilar and bronchial vascular bundles. The paramediastinal area, para-aortic area, pericardiac area and para-diaphragm area are all easily neglected because they lie on the edge of the lung field close to the mediastinum, aorta, and pericardium respectively (*Figure 3*).

Airway (trachea and bronchus)

A study on missed diagnosis of lung cancers has determined that most lung cancers that have been missed on CT are endobronchial in location, with a mean diameter of 1.2 cm (11). These findings emphasize the significance of assessing the central airways to ensure the exclusion of endotracheal or endobronchial lesions. For a considerable time, the trachea has been acknowledged as a frequently overlooked blind spot or neglected area by radiologists during the interpretation of chest CT scans (16) (*Figure 4*). Evaluating this region is of significant importance, as tracheal abnormalities commonly manifest on chest CT scans before the onset of symptomatic presentation in patients. The primary and peripheral bronchus lesions are also easily missed due to obstructive pneumonia interference.

The trachea and primary bronchi are common sites of tumor development, and the most common types are squamous cell carcinoma and carcinoid, with squamous cell carcinoma and carcinoid tumors being the predominant subtypes. Specifically, they include mucoepidermoid carcinoma and adenoid cystic carcinoma. Malignant lesions within the trachea and bronchi may manifest as endoluminal nodules, with subtle wall thickening, or irregular luminal contours. A meticulous evaluation of the airways, focusing on intraluminal lesions and wall thickening, serves as a critical approach to improve the detection of bronchial and tracheal neoplasms. Benign tumors of the trachea are rare. These tumors should be distinguished from foreign bodies and intraluminal secretions (*Figure 4*). The aspiration of foreign bodies can lead to notable complications, including recurrent atelectasis or pneumonia. Secretions within the trachea are often located in the posterior wall of the trachea due to gravity and are often accompanied by gas. Furthermore, contrast medium could also be useful to distinguish neoplasms from secretions in airways.

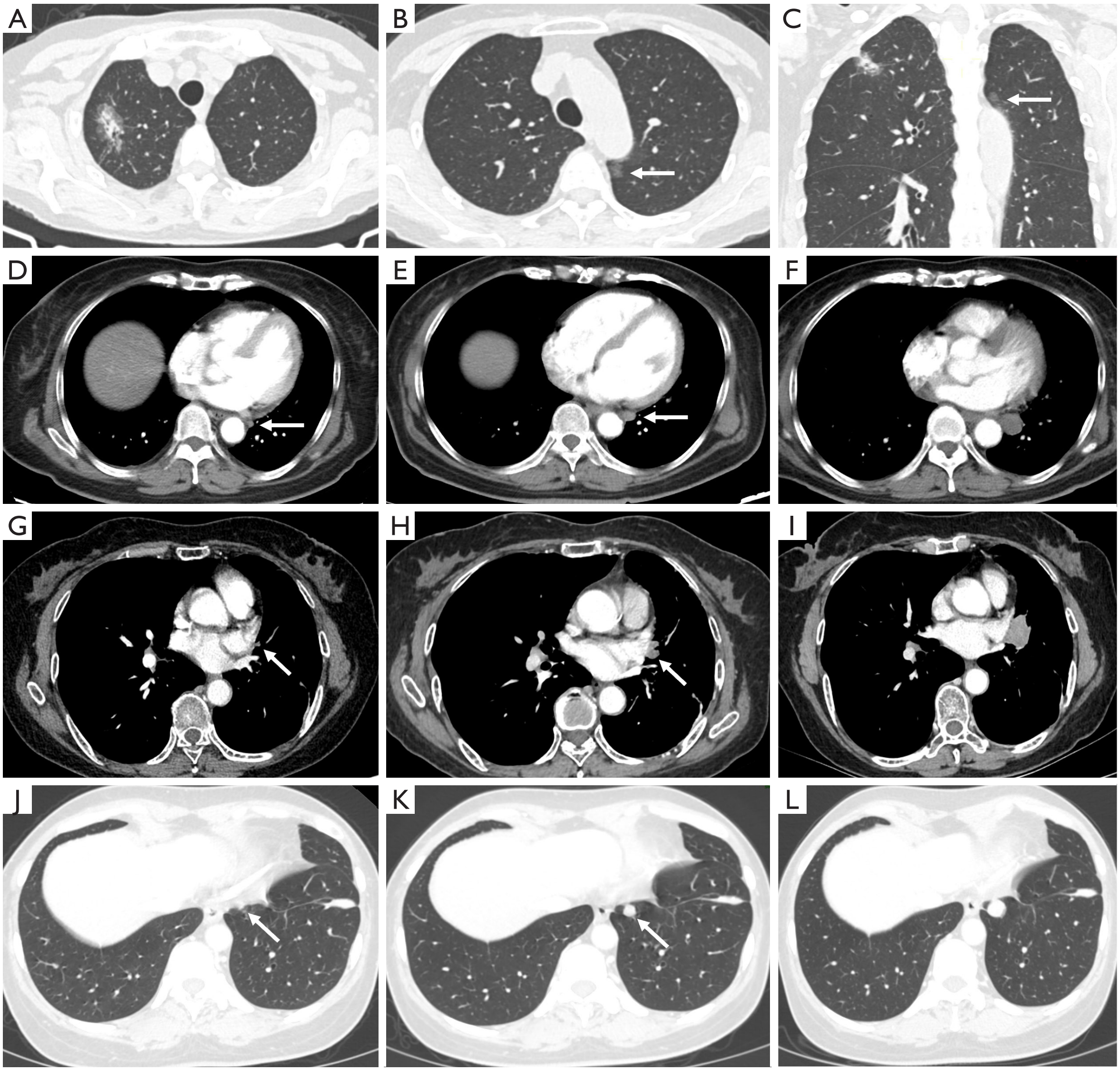

Figure 3 Blind spots of lung: the para-aortic, paramediastinal, pericardiac and para-diaphragm areas. (A-C) A 66-year-old female with adenocarcinoma of the right upper lung lobe. The radiologist overlooked the ground-glass opacity near the aortic arch in the left upper lobe (arrows) (B,C) because of the more noticeable lesion in the right upper lobe. (D-F) A 69-year-old female with a missed solid nodule in the first two CT images near the poster mediastinum in the left lower lobe (arrows) that gradually grew in size during follow-up. (G-I) A 63-year-old female after resection of the left lung adenocarcinoma. A new small nodule near the left pericardium (arrows) was missed in the first two CT exam, showing gradual enlargement during the follow-up period, and subsequent confirmed adenocarcinoma by biopsy. (J-L) A 52-year-old female after resection of the right upper lung lobe adenocarcinoma. (J,K) A new nodule near the diaphragm had been growing in size (arrows), raising concerns about it being a metastasis. Due to its hidden location and interference from a nearby shadow, there is a risk of overlooking this lesion. CT, computed tomography.

Pleura

Due to their peripheral location, small pleural lesions often evade detection by radiologists. Therefore, it is imperative to thoroughly examine the pleural surface, including the diaphragmatic pleura, for any signs of nodularity during the interpretation of all chest CT scans. In addition, pleural lesions are easy to be misdiagnosed as intrapulmonary lesions due to localization errors (*Figure 5*), so thin-slice CT

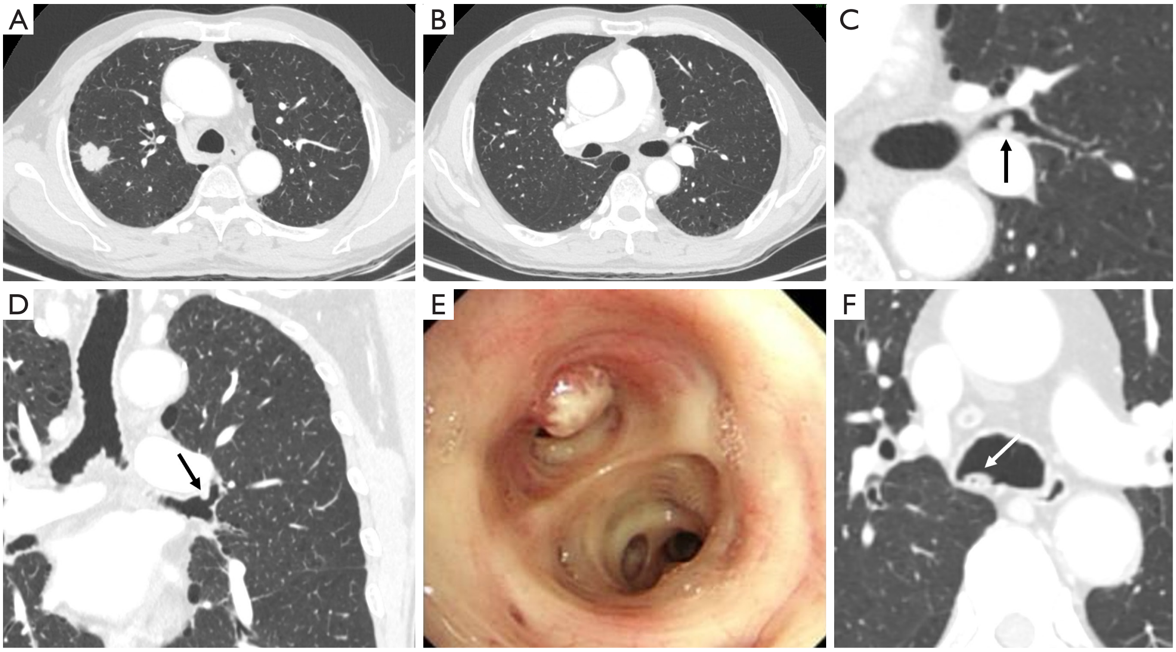

Figure 4 Blind spots on chest CT: trachea and bronchus. (A-E) A 65-year-old male with right upper lung lobe cancer. (B-D) Radiologists reported the main lesion in the right lung, but a small nodule in the bronchus of the left upper lobe was overlooked on CT scan (arrows). (E) Bronchoscopy revealed the neoplasm obstructing the lumen of the left upper lung lobe bronchus, which was pathologically confirmed to be a squamous cell carcinoma. (F) The trachea or bronchus tumor should be distinguished from intraluminal secretion which is more common seen as shown in this case (arrow). CT, computed tomography.

observation is very important.

The pleura is a common metastatic site for lung cancer and other malignant tumors, which indicate an advanced stage. In patients with confirmed or suspected malignancy, the presence of multiple or newly identified pleural or fissural nodules should raise consideration for pleural metastases. Vigilant scrutiny of pleural nodularity or thickening holds significant importance in patients with inexplicable pleural effusion, as it serves as a vital diagnostic criterion for malignancy. The primary lesions of the pleura include solitary fibrous tumors and mesothelioma. Mesothelioma is difficult to distinguish from metastases on CT (17).

Heart

The enhanced speed of CT scanning, which minimizes cardiac pulsation artifacts, has significantly improved the clarity of the heart in routine chest CT examinations. Given that cardiac abnormalities often lack symptoms or present with non-specific symptoms like chest pain and dyspnea, routine chest CT scans may occasionally serve as the initial diagnostic study where these incidental abnormalities are first detected. As reported in a study, a significant proportion of scans (approximately 78%) exhibited incidental cardiac findings. Surprisingly, only a minimal percentage (3%) of these findings were explicitly documented or referenced within the scope of the study (18).

Coronary calcification and cardiomegaly are very common cardiac imaging abnormalities that can be recognized on routine chest CT, both findings are associated with an increased risk of future cardiovascular events (19,20). Congenital abnormalities, such as anomalous course of coronary arteries and small septal defects can also be detected at routine enhanced chest CT although not common. Myocardial infarction can be detected occasionally according to the subtle density changes in the myocardium. Sometimes intracardiac mural thrombi can be observed on chest CT in patients with heart disease (*Figure 6*). For patients who underwent CT-guided biopsy, cardiac air embolism should never be neglected because this rare complication is fatal (21). Primary heart tumors are uncommon, but the cancer tends to metastasize to the pericardium. Careful inspection of the pericardium for effusion and nodular thickening is warranted, particularly in patients with known malignancy.

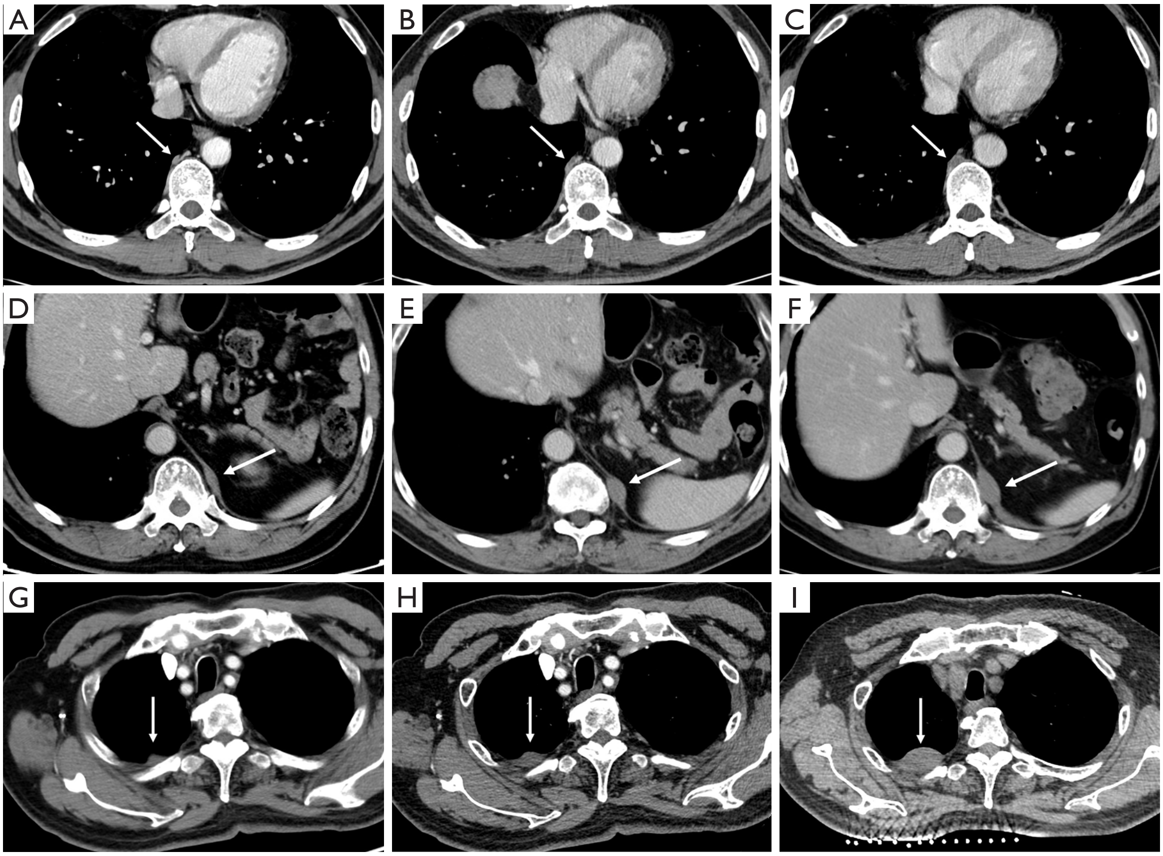

Figure 5 Blind spot on chest CT: pleura. (A-C) A 57-year-old male with lung metastases after right upper lobe adenocarcinoma resection. There was initially missed gradual thickening of the right paravertebral pleura (arrows), which was diagnosed as pleural metastasis. (D-F) A 69-year-old man with a neuroendocrine tumor in the anterior mediastinum. A initially missed spindle-shaped nodular shadow was observed in the left diaphragmatic pleura (arrows). Follow-up chest CT revealed enlargement of this nodule, suggesting a metastatic lesion. (G-I) A 71-year-old male with right lower lobe lung cancer. Enhanced CT revealed missed nodular thickening of the right pleura (arrows). The final biopsy confirmed aggressive fibromatosis. These lesions were all missed in the first two scans. CT, computed tomography.

Vascular structure

Chest enhanced scan is a good way to show the blood vessels in the chest, most importantly the pulmonary artery and the thoracic aorta. Pulmonary embolism is the most common thoracic vascular disease and can be seen on routine chest contrast-enhanced CT incidentally appearing as the filling defect. In a retrospective study involving cancer patients who underwent chest CT, incidental pulmonary emboli were identified in 4% of cases (*Figure 6*). However, it was found that only 25% of these incidental pulmonary emboli were initially documented in the radiology findings (22). Common and important lesions of the aorta include penetrating aortic ulcers, dissecting, aneurysms, and vasculitides (*Figure 6*). Although the incidence of vascular disease is low, it has greater health risks and belongs to emergency reporting items in the radiology apartment. A thorough examination of all vascular structures is crucial to optimize detection accuracy and minimize the risk of diagnostic omissions.

External mediastinal lymph nodes

Like the lungs, the mediastinum is the focus of chest CT observations. Mediastinal lymph node partition is the key knowledge of chest CT scans, it is the basis of N stage lung cancer. Some of the lymph node areas in chest CT are not within the partition and belong to the M stage, such as the internal mammary area, pericardial diaphragm group, the supraclavicular area, paravertebral and intercostal lymph nodes (23). These areas are also often the blind spots to

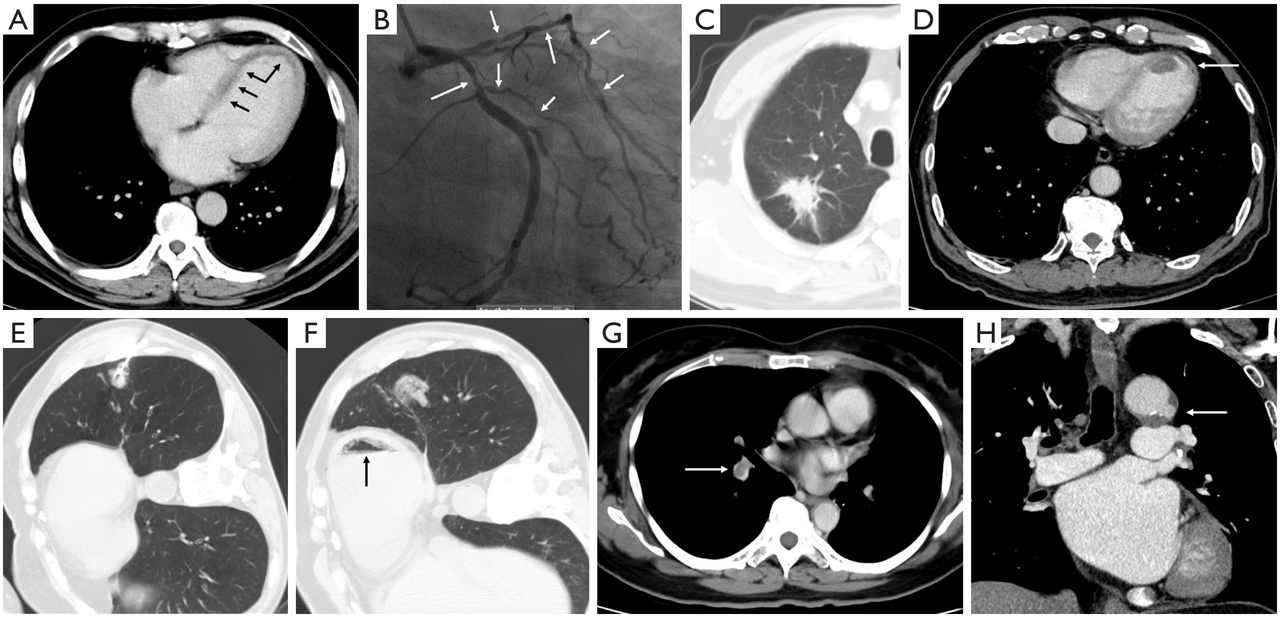

Figure 6 Blind spots on chest CT: heart and vascular structure. (A,B) A 45-year-old male with nasal NK/T-cell lymphoma and coronary heart disease. (A) The radiologist failed to identify subtle linear low-density shadows in the left ventricular wall (arrows), which are consistent with myocardial infarction. (B) Subsequent coronary angiography showed multiple stenoses (arrows) in the left anterior descending and circumflex coronary arteries. (C,D) A 70-year-old male with right lung cancer and a history of prior myocardial infarction. (D) Chest CT image revealing a low-density thrombus in the left ventricle, along with linear low-density shadows within the myocardium (arrow), indicating infarction. (E,F) A 72-year-old male with lung nodules in the left lower lobe underwent CT-guided biopsy. The immediate follow-up CT image after biopsy showed air within the left ventricle (black arrow), which is easily missed and lead to fatal result (F). (G) A 61-year-old female with metastases after left lung cancer surgery. The filling defects in the right middle and lower pulmonary artery (arrow), suggesting pulmonary artery embolism, was missed in the report. (H) A 66-year-old male with a missed low-density niche in the aortic arch on CT image (arrow), suggesting a penetrating ulcer. CT, computed tomography; NK, natural killer.

observe the lymph nodes (*Figure 7*). Precise detection of lymphadenopathy in these specific regions assumes critical importance in the staging of lung cancer, as the involvement of such nodes renders patients ineligible for surgical resection. A study utilizing PET-CT imaging has revealed a notable tendency to overlook supraclavicular lymphadenopathy during CT examinations (24). In the initial stages of a chest CT scan, the presence of numerous rounded structures, including craniocaudally oriented vessels and musculature within this region, may contribute to the inadvertent oversight of supraclavicular lymphadenopathy. Internal mammary areas are the common sites for breast cancer. In addition to lymph nodes, Pericardial cysts and thymomas can also be missed in the cardiophrenic angle region (*Figure 7*).

Thyroid

Chest CT includes partial thyroid, but because the thyroid belongs to the cervical organ tube, it is easy to be ignored in the chest CT scan. Incidental thyroid nodules (ITNs) on chest CT are becoming more and more common (*Figure 7*), with the reported prevalence over 25% of contrast-enhanced chest CT scans, but the malignancy rate of occasional thyroid nodules of chest CT ranges from only 0% to 11%. The excessive screening, diagnosis, and treatment of thyroid cancer have aroused widespread concern and debate (25,26). Despite the ongoing uncertainty surrounding the optimal management of incidentally detected thyroid nodules on CT scans, it is prudent to assign a diagnosis and provide recommendations for additional examination for all identified thyroid nodules. The CT study should first be evaluated for suspicious features associated with the ITN, including abnormal lymph nodes or signs of local invasion, neither of which is likely in a patient without thyroid-related symptoms. In general, thyroid nodules measuring 1 cm or larger, particularly those displaying invasion

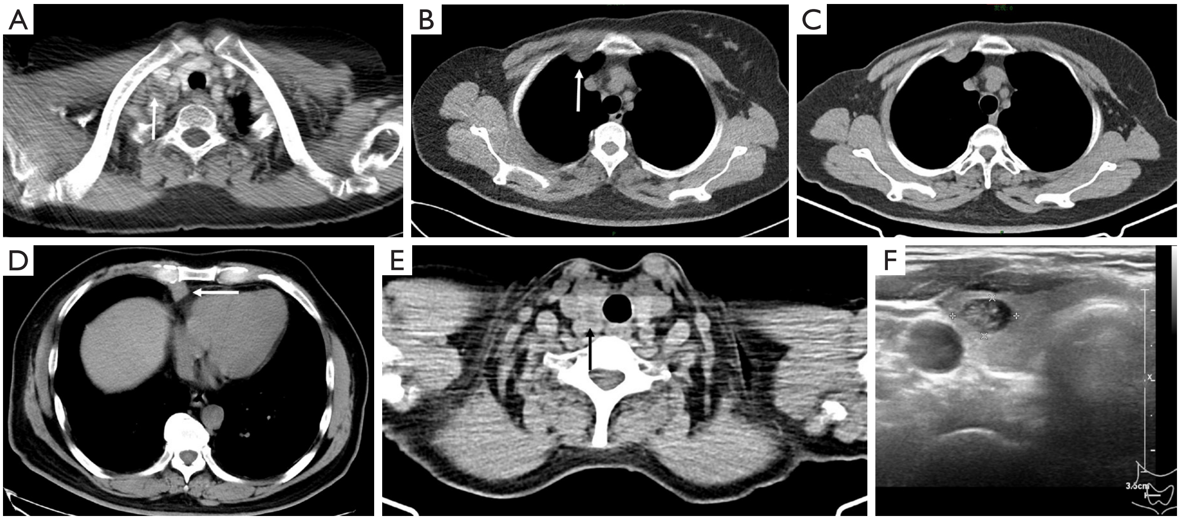

Figure 7 Blind spots on chest CT: external mediastinal lymph nodes and thyroid. Lymph nodes located outside the mediastinal area on chest CT, such as (A) those above the right clavicle (arrow) and (B,C) those in the internal mammary region (arrow), may be easily missed. (D) A 65-year-old male after surgery for a thymoma. During the follow-up period, a tumor nodule in the right cardiophrenic angle region (arrow) was missed and later confirmed as a thymoma recurrence (type AB). (E,F) A 64-year-old female with an incidentally detected low-density nodule in the right thyroid lobe (arrow) during low-dose CT screening; this nodule was identified as a nodular thyroid goiter through ultrasound. CT, computed tomography.

of neighboring structures or accompanied by adjacent lymphadenopathy (abnormal lymph nodes are defined as enlarged nodes or those with cystic change, calcification, or increased enhancement), warrant appropriate referral for ultrasound evaluation, with consideration for fine-needle aspiration (FNA) (27,28).

Osseous structures

Osseous structures of the thorax, including the vertebral bodies, ribs, sternum, clavicles, proximal portion of the humeri, and scapulae, can be involved in pathologic processes potentially visible on CT. Chest CT showed better bone than chest film. Nevertheless, subtle bony abnormalities can occasionally escape detection due to the omission of bone window images or limited time allocated by radiologists for the evaluation of multiple ribs, vertebral bodies, and other thoracic bony structures.

The most common and important of the missed bone diseases are fractures and metastases (29). Bone metastasis detected on chest CT is important for cancer staging (*Figure 8*). Among malpractice claims against radiologists, missed fractures rank as the second most frequent cause. In addition, incidental osteoporotic vertebral compression fractures are common on body CT in adults, with a prevalence of 10–35%, but it is often underreported (30-32). The utilization of sagittal multiplanar reformation images is especially valuable for expediting the evaluation of spinal alignment and vertebral body height. Conversely, the comprehensive assessment of images across all three planes (axial, sagittal, and coronal) enhances the detection of inconspicuous lesions in the clavicles, scapulae, sternum, or ribs. Although infrequent, intramedullary metastases and primary spinal neoplasms, including ependymoma and meningioma, may occur (33).

Breast

CT is not the preferred or ideal imaging technique for assessing breast tissue, but typically, a portion, if not all, of the breast tissue can be visualized on chest CT. A retrospective study found that incidental breast lesions were detected in 7.63% of female patients who underwent chest CT scans for various clinical indications. Among these incidental findings, 1.85% were identified as breast cancer (34). About 30% of incidental breast lesions detected on CT prove to be unsuspected breast cancers (35). These results underscore the critical need for careful evaluation of the breast tissue on chest CT images, as incidental findings, though infrequent, may have significant clinical

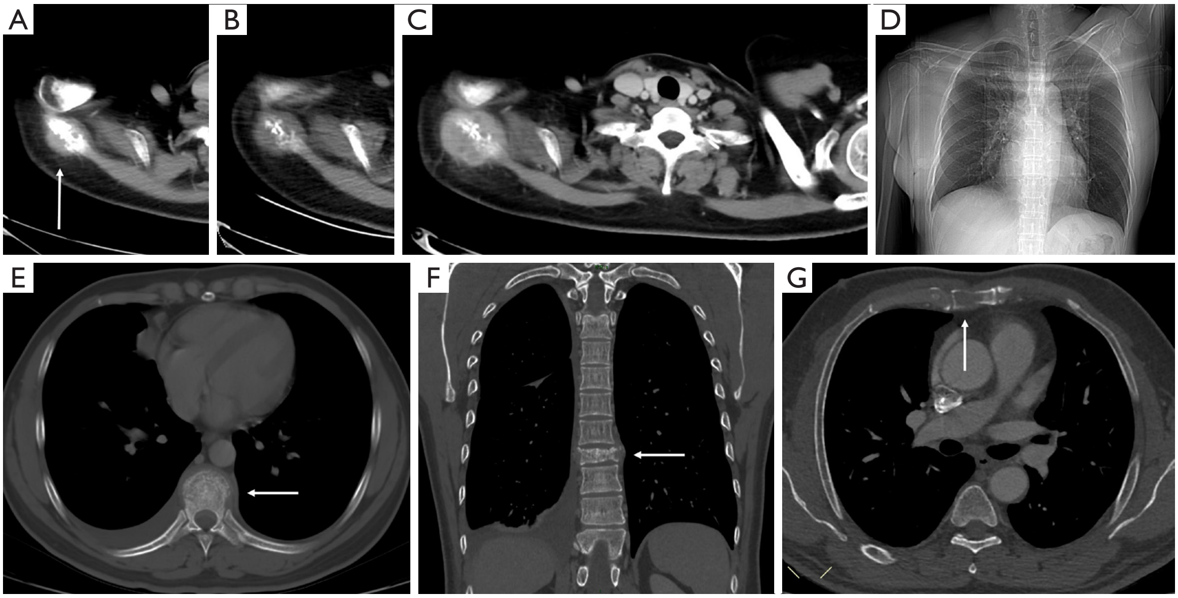

Figure 8 Blind spot on chest CT: bone. (A-D) A 44-year-old female with thymic squamous carcinoma. Metastasis to the right scapula (arrow) was neglected on CT. Retrospective observation revealed progressive bone destruction and enlargement of the soft tissue mass. Despite a lack of relevant clinical information on the requisition form, the patient's inability to elevate her right arm (D, CT scout image) emerged as a crucial indicator of right shoulder disease. (E,F) A 33-year-old male with adenocarcinoma of the right lung and multiple metastases. Radiologists ignored vertebral metastasis with surrounding soft tissue swelling (arrow). A clearer depiction was obtained with the MPR of the coronal plane, revealing vertebral bone destruction and compression fractures (arrow). (G) Radiologists failed to identify sternal metastasis on chest CT (arrow). CT, computed tomography; MPR, multiplanar reconstruction.

implications, including the early detection of malignancies that might otherwise go unnoticed. Routine contrast-enhanced chest CT can reveal sufficient details to allow for the detection of unsuspected breast cancer (*Figure 9*). An irregular margin of incidental enhancing breast lesion and non-mass-like enhancement can be considered a suggestive sign of malignancy (36). Breast calcifications seen on CT are nearly all benign.

Upper abdomen

Chest CT typically captures a portion of several upper abdominal organs, including but not limited to the liver, adrenal gland, kidney, gastrointestinal tract, and pancreas (*Figure 10*). These are often the chest CT scans of the blind area due to the location of the last few images. The adrenal gland demonstrates heightened vulnerability to metastatic involvement originating from lung cancer (37). Therefore, even if a patient has a malignant tumor in another part of the body, when a CT scan detects an adrenal nodule incidentally, the possibility of an adrenal adenoma should be considered first, rather than metastasis. In addition asymptomatic occasional pheoc hromocytoma should be identified, because 30–50% pheochromocytomas are found incidentally (38,39). Furthermore, there is a possibility of incidental asymptomatic enteric abnormalities, such as colon or gastric cancer, being present in certain cases (*Figure 10*) (40).

Techniques to avoid errors

Error reasons and types

Awareness of commonly missed chest CT findings, their causes, and their consequences is important in developing approaches to reduce and mitigate these errors if managed within a just, supportive culture. Image diagnosis errors can be divided into perceptual errors and cognitive errors. Missed diagnosis is a perceptual error, accounting for the majority of imaging diagnostic errors about 60–80% (41,42), and is more likely to cause serious consequences. Limited time to read the image, lack of attention due to fatigue, lesions located in the blind area and so on are the reasons for missed diagnosis (43).

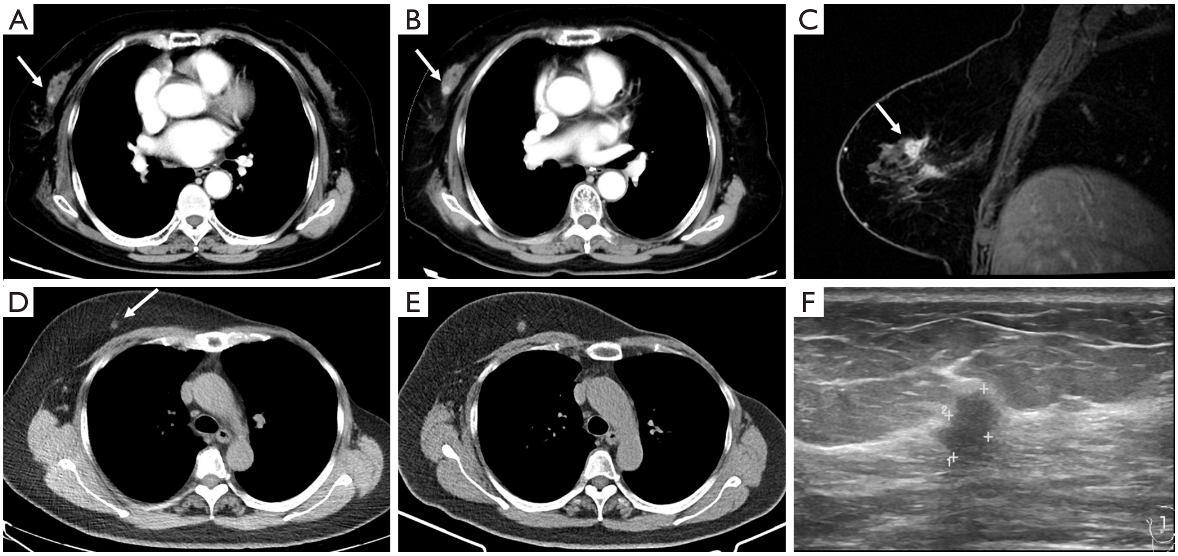

Figure 9 Blind spot on chest CT: breast. (A-C) A 69-year-old female after surgery for left lower lobe. A growing nodule in the right breast was ignored during the follow-up period (arrows) (A,B). Later, an irregular and abnormal enhanced mass was seen on contrast-enhanced MRI (arrow) (C), combined with its signals in different sequences, it was confirmed to be breast cancer. (D-F) A 56-year-old female after left breast cancer resection. Because of its small size, radiologists have repeatedly overlooked a small nodule in the right breast upon multiple postoperative low-dose CT exams (arrow). A retrospective review revealed that there was progressive enlargement of this right breast nodule, and ultrasound confirmed the presence of breast cancer. CT, computed tomography; MRI, magnetic resonance imaging.

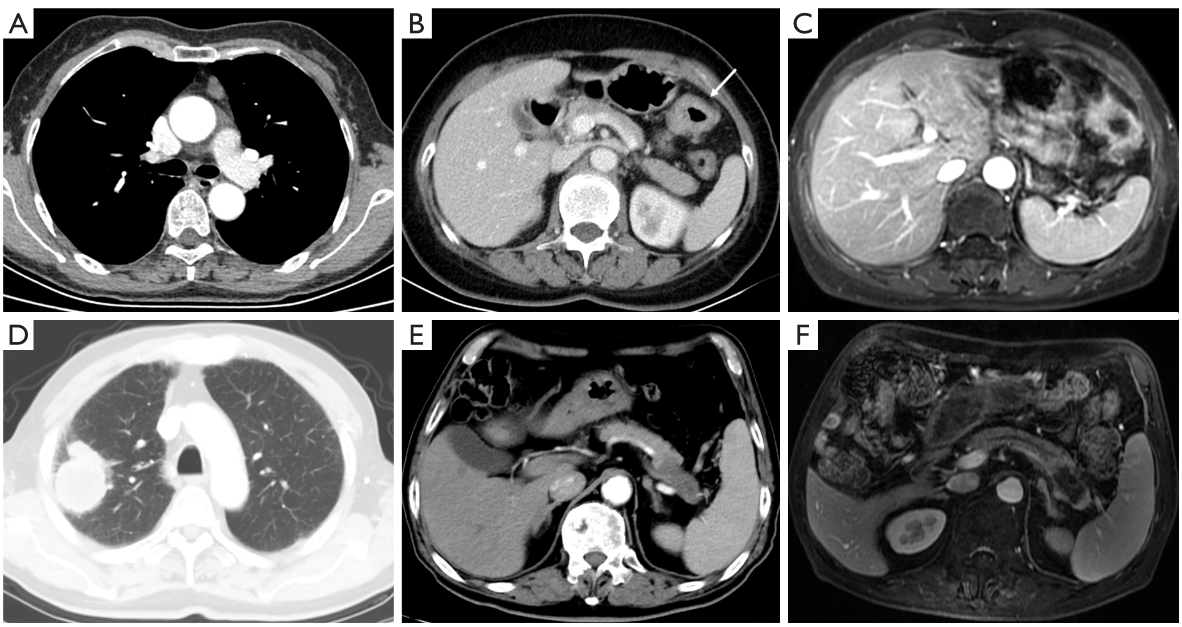

Figure 10 Blind spot on chest CT: the upper abdomen. (A-C) A 54-year-old female after resection of a thymic cyst in the anterior mediastinum. (B) The thickening of the colonic splenic flexure was missed on chest CT (arrow). During the follow-up period, she was diagnosed with colon cancer through colonoscopy. Subsequent MRI also revealed thickening of the colonic splenic flexure wall. (D-F) A 71-year-old male with lung cancer in the right upper lung lobe. (E) CT image showing an ill-defined mass in the pancreatic tail, which was initially missed. (F) MRI images revealing the same mass with an abnormal signal; the degree of enhancement on the enhanced scan was lower than that of the normal pancreas, and the splenic artery and vein were involved, suggesting pancreatic cancer. CT, computed tomography; MRI, magnetic resonance imaging.

Certain perceptual errors can be attributed to cognitive biases inherent in the human brain, with the most prevalent being the satisfaction of search phenomenon. This phenomenon entails a diminished level of vigilance towards additional abnormalities after the detection of the initial lesion, leading to premature termination of examination and unintentional omission of other critical lesions. The satisfaction of search bias is a widespread perceptual error, accounting for approximately 22% of diagnostic inaccuracies (44). Of chest CT exams, 43% of patients with missed lung cancer were found to have significant distracting findings in other regions of the thorax (11). A majority of missed lung cancers were accompanied by underlying lung diseases such as tuberculosis, emphysema, or interstitial fibrosis (12). The other recognition of thinking pitfalls is inattentional blindness, which describes findings that can be missed because of their location (e.g., the last sections of the acquisition or the periphery of the field of view) or because of the unexpected nature of the findings when one is engaged in a demanding task (45,46), such as missing clavicle missed on chest radiographs in 60% of readers (47).

Techniques to avoid errors

In addition to careful review of images, there are several techniques that radiologists can use to avoid or reduce errors due to blind spots during film reading and reporting. These techniques include multiplanar reconstruction (MPR) (*Figure 8*), maximum intensity projection (MIP), and artificial intelligence (AI). MPR images are an important supplement to transverse CT scanning. It can help to fully observe the images from multiple angles and reduce the missed diagnosis of blind area lesions, such as sagittal reconstruction for vertebrae morphology assessment. MIP images can increase the reading speed and sensitivity of lung nodule detection, by providing fewer images and less time to review images. MIP images can improve the sensitivity of detection for small solid pulmonary nodules and increase reader confidence level (*Figure 2*) (48). In addition, there was a significant reduction in the number of images to review and, consecutively, in reporting time with MIP presentation (49). AI in diagnostic radiology is undergoing rapid development. Even though limitations such as the significant number of false-positive findings and the bias in different AI algorithms remain (50), AI algorithms have shown the potential to support radiologists in their day-to-day tasks of evaluating chest CT scans by automating lung nodule detection and alleviating the workload of doctors (51,52). In clinical practice, using AI software to initially detect lung nodules, followed by a manual review, helps to reduce the risk of missed diagnoses. This approach leverages the efficiency of AI for preliminary screening and the expertise of human interpretation for final assessment, significantly improving diagnostic accuracy. Many radiologists are trying to use structured reporting. Structured reports have many benefits, such as standardized format, improved report completeness, easier to compare to previous reports, facilitates decision-making for treatment, etc. The structured report format resembles a diagnostic checklist during the interpretation of CT images, aiming to mitigate the risk of inadvertent omission of clinically significant findings that are frequently missed. It has been reported that inexperienced readers using structured reporting (SR) templates from the Royal College of Radiologists (RCR-SR) and the Italian Society of Medical and Interventional Radiology (SIRM-SR) demonstrated significantly higher completeness (90% for RCR-SR and 100% for SIRM-SR) and accuracy (70% for SIRM-SR) compared to traditional non-systematic reports (NSR) (70% completeness and 55% accuracy), indicating their potential to enhance reporting skills for non-small-cell lung cancer (NSCLC) staging (53). Moreover, if a structured report is not used, radiologist can adopt a mental scheme to remember all the districts to look at.

Conclusions

This article summarizes and analyzes the blind spots and related diagnostic errors that are easily missed on chest CT through the presentation of specific cases, and then proposes feasible methods to avoid these errors in the process of image reading. This has important implications for the daily imaging diagnosis and continuing education of physicians.

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Footnote

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://jtd.amegroups.com/article/view/10.21037/jtd-24-1125/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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