

Incidental Findings Discovered during Coronary CTA at King Hussein Medical Center

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ABSTRACT

Objective: To evaluate the incidence and significance of extra cardiac findings discovered during Computed Tomography Coronary Angiography.

Methods: A retrospective review over the period of two years (between March 2010 and September 2011), of 400 patients who underwent coronary computed tomography scan for non-acute coronary symptoms or a follow up of coronary stents. Non-cardiac incidental findings were documented.

Results: A total of 400 patients were included in our study, 308 were males and 92 were females. Age ranged between 31-74 years, 25(6.25%) patients had incidental extra cardiac findings. Of these patients six had pulmonary nodules, one had lung mass, three had pulmonary embolism, four had focal liver lesion and one had inferior vena cava thrombus.

Conclusion: Coronary computed tomography scan can reveal significant extra cardiac findings affecting patient outcome, thus these findings should be included in each report.

Key words: Coronary CT, Incidental findings.

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Introduction

With the introduction of multi-detector row technology and electrocardiographic-gated computed tomography angiography (CTA) scanning of coronary arteries, and with development of advanced software reconstruction methods, it is now possible to evaluate the coronaries in non-invasive manner with high spacial resolution in just few minutes.^(1,2) Patients with atypical chest pain and those with strong family history of coronary artery disease (CAD) are candidates for this examination as well as patients with known CAD following stenting and coronary artery bypass graft surgery. Studies reported sensitivity of 87% and specificity of 89% for detection of coronary artery stenosis.⁽³⁾

In addition to coronary arteries, heart chambers and pericardium, coronary CTA can evaluate great vessels, portions of lungs, chest wall, liver and bony cage.^(4,5) The aim of this study is to evaluate the incidence and significance of extra cardiac incidental findings during coronary CTA in our institution.

Methods

A retrospective review of 400 patients who underwent coronary CTA over two year period (from March 2010 till September 2011) was conducted. Of these 308 patients were males and 92 were females. Age ranged between 31-74 years (mean age 61 years). All patients were referred for coronary CTA from the cardiology

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Table I: Spectrum of incidental findings.

Findings	No.	%
Liver lesion	4	16
Lung mass	1	4
Lung nodule	6	24
Liver Cirrhosis	1	4
Lung fibrosis	5	20
IVC thrombosis	1	4
Pulmonary embolism	3	12
Pericardial effusion	4	16
Total No. of patients with finding	25	100

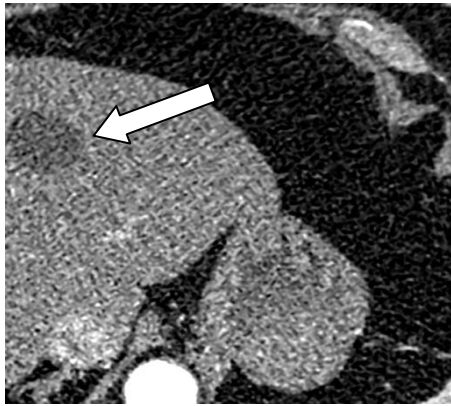


Fig.2a: Hypodense left liver lobe lesion.



Fig.1: Inferior vena cava thrombus.



Fig.2b: Multiple hypodense liver lesions suggesting metastasis.

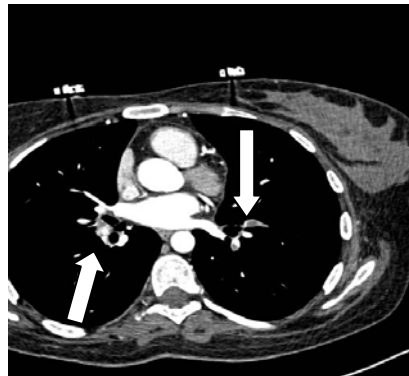


Fig.3: Filling defect in pulmonary arteries indicating pulmonary embolism.

department with non-acute chest pain and for evaluation of stents and grafts in coronary arteries. Patients with known malignancy and documented lung, spine, and liver abnormalities were excluded from this study. All Scans were performed on a dual source 64-multi-detector CT scanner (Somatom definition, Siemens medical solutions). Scan was done with ECG-gated techniques from lung apices down to inferior margins of the heart in a single breath hold. Parameters included KVp of 140, mAs 350, slice thickness 1-mm, collimation of 0.75x16 and pitch of 0.2. A total of 65-80 mL of non-ionic iodinated contrast material was infused at a rate of 4 mL/s (Iopamero 370, Bracco s.p.A, Milan, Italy). Image interpretation was done on a Syngo

VE32B workstation (Siemens AG, Berlin, Germany).

Findings were divided as cardiac, including coronary arteries, pericardium and heart itself, and extra-cardiac such as pulmonary, mediastinal, pleural, skeletal or upper abdominal findings. Image interpretation was made by two experienced radiologists.

Results

Of 400 patient, 25 (6.25%) had extra cardiac findings requiring follow up or further evaluation. Six patients had pulmonary nodule, one had lung mass, three patients had subclinical pulmonary embolism, one patient had inferior vena cave thrombus (Fig. 1) and four patients

were found to have liver lesion. One had undiagnosed liver cirrhosis and pericardial effusion was found in four patients (Table I).

Discussion

Extracardiac findings are being reported frequently due to the increased frequency of requests by cardiologists to exclude atherosclerosis. Review of literature showed a large study by Hunold *et al.* on 1,812 patients who underwent cardiac CT scan for calcium scoring. This study revealed high percentage of findings because many minor findings such as atelectasis, rib fractures and scars were included in the study.⁽⁵⁻⁷⁾ The prevalence of incidental findings in our study was 6.25%. The relatively low prevalence is attributed to the fact that many non-significant incidental findings such as pleural effusion were not included in this study. One of the patients with incidental left liver lobe hypodense lesions underwent triphasic liver CT scan and liver ultrasound which were suggestive of metastatic deposits as part of tumor workup patient had colonoscopy which revealed sigmoid tumor (Fig. 2a and 2b). Another patient with left lung soft tissue density mass underwent CT-guided fine needle aspiration biopsy and the mass was proved to be lung adenocarcinoma. Three cases of subclinical pulmonary embolism were reported (Fig. 3). Pulmonary nodules were seen in six cases but unfortunately no long term follow up was conducted. In a study by Onuma *et al.* 2.4% of 503 patient has pulmonary nodules larger than 1cm, and 9.7% smaller than 1cm and 0.8% had asymptomatic malignant tumor on follow up.⁽⁸⁾ Burt *et al.* reported the incidence of nodules to be about 18%, and this was contributed to older age group in this study.⁽⁹⁾

Limitations of the study

The lack of long term follow up and relatively small study sample were limitations of the study,

hence there is a need for multi-institutional large study to confirm results and evaluate the significance of these incidental findings.

Conclusion

Incidental findings found during coronary CTA are common and some of them are significant so they should be included in coronary CTA report.

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