Differentiation of pulmonary artery sarcoma from pulmonary embolus utilizing 128-slice dual source prospective cardiac-gated computed tomography scan

Antonino Germana, Nathan C Hawkes, Scott A Alexander, Gilbert E Boswell

ABSTRACT

Abstract is not required for Clinical Images
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CASE REPORT

A 54-year-old female with no significant past medical history presented with progressive dyspnea with exertion. Transthoracic echocardiogram was significant for a mass lesion and a pressure step-up from 6–55 mmHg at the origin of the right pulmonary artery (PA). Sarcoma was diagnosed on subsequent cardiac magnetic resonance imaging (MRI) based upon contrast enhancement of the mass (Figure 1) [1]. Thin section Flash® non-contrast, first pass post-contrast, and delayed adaptive sequential images were obtained to stage the disease and determine extent of involvement (Somatom Definition Flash®, Siemens Healthcare, Forchheim, Germany). Contiguously soft tissue-filled PAs were found to enhance with contrast (Figure 1). These findings are consistent with sarcoma and not embolus, which guided the patient toward neoadjuvant chemotherapy with adriamycin/ifosfamide and attempt at curative resection [2]. Subsequent pathologic examination confirmed a sarcoma with leiomyosarcomatous differentiation (Figure 2).

DISCUSSION

Primary pulmonary artery sarcoma is a rare malignancy with poor prognosis that frequently presents with symptoms of PA obstruction, pulmonary arterial hypertension, and right ventricular failure [3]. More frequently seen extensive thromboembolic disease presents similarly, which can delay definitive imaging diagnosis and management. Magnetic resonance imaging (MRI) is highly specific for identifying PA sarcomas because the tumor enhances with gadolinium contrast more than bland thrombus [1]. Chest computed tomography (CT) scan findings such as a low-attenuation filling defect occupying the entire luminal diameter of the main or proximal PA, an expansion of any segment of the pulmonary artery with an extensive intraluminal filling defect, or extraluminal extension can also help...
differentiate pulmonary artery sarcomas from pulmonary artery thromboembolism [4]. As much as delayed phase contrast enhancement has helped in differentiating between benign and malignant mass lesions, visualization of a low attenuation filling defect within a pulmonary artery on contrast-enhanced cardiac CT studies can further suggest malignancy, such as pulmonary artery sarcoma, if the lesion demonstrates enhancement throughout the delayed phase.

CONCLUSION

New computed tomography imaging techniques such as 128-slice dual source computed tomography with prospective technique can optimize evaluation of a pulmonary artery mass and provide concomitant thin-section evaluation of the intra- and extravascular spaces, which can be critical in pre-planning for neoadjuvant chemotherapy and attempt at curative resection. To the best of our knowledge, we are first to present a case of pulmonary artery sarcoma that demonstrates enhancement throughout the delayed phase on prospective gated cardiac computed tomography. This finding may further differentiate pulmonary artery sarcoma instead of chronic thromboembolism.

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Author Contributions

Antonino Germana – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Nathan C Hawkes – Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Scott A Alexander – Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Gilbert E Boswell – Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Figure 2: (A) Pulmonary artery sarcoma with leiomyosarcomatous differentiation and treatment effect (H&E stain, x100), (B) Pulmonary artery mass lesion in cross-section demonstrating complete occlusion of the vessel (H&E stain, x400).
Guarantor
The corresponding author is the guarantor of submission.

Conflict of Interest
Authors declare no conflict of interest.

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