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INTRIGUING VASCULAR ENCOUNTER: ANEURYSM ALONG AN ABERRANT SYSTEMIC ARTERY TO THE LUNG- RADIOLOGY CASE STUDY

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Case Summary

Systemic arterial supply to the lungs from an aberrant artery is a rare congenital anomaly, and the occurrence of an aneurysm along this aberrant vessel is an even rarer phenomenon.

We present a detailed case study of a 69-year-old male diagnosed with a fusiform aneurysm of an aberrant systemic artery supplying the right lower lobe.

Accurate diagnosis was achieved through CT angiography, enabling precise visualization of the anomalous artery and the aneurysmatic dilatation. In this unique case, a 69-year-old male presented with persistent cough, chest/back pain, dyspnea, prompting medical attention.

Ultrasonography revealed an atypical dilation of the inferior vena cava (IVC), measuring up to 3.5 cm, alongside a distinct sub-hepatic vascular structure.

Doppler imaging indicated a discernible signal, prompting further investigation through CT angiography. Notably, during imaging, features suggestive of intra-lobar sequestration were observed, indicating a potential connection between the vascular anomalies and eventual respiratory symptoms.

Keywords: intra- lobar sequestration, aberrant systemic artery, aneurysm, CT angiography.

Imaging Findings

The parenchymal CT window depicted hyper inflated lung segment in the RLL, closely associated with the adjacent normal lung tissue and lacking a separate pleura, typically exhibiting venous drainage primarily through the pulmonary veins, but no contact with the tracheal- bronchial system.

Upon CT angiography examination, a hypo-attenuating para-spinal mass was observed during the early arterial phase (refer to Figure 1), which gradually transformed into a homogeneously enhancing vascular structure in the venous phase (as depicted in Figure 2).

Notably, there was an absence of thrombotic elements within the lumen. The three-dimensional reconstructions notably facilitated visualization, revealing a bi-lobulated aneurysm emanating from an aberrant artery originating in the suprarenal abdominal aorta. This anomalous artery, displaying a tortuous and thick-walled nature reminiscent of a pulmonary artery, notably challenges conventional expectations (refer to Figures 3a and b).

These findings strongly indicate the presence of intra-lobar sequestration coupled with an aneurysm along the aberrant systemic artery, further highlighting the complexity of the diagnostic journey.

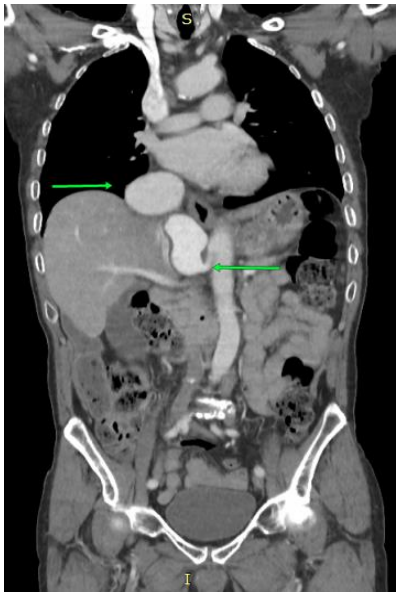

Figure 1. The coronal view of the CTA (computed tomography angiography) in the early arterial phase illustrates an oval, well-demarcated hypo-attenuating para-spinal mass located in the right lower lobe.

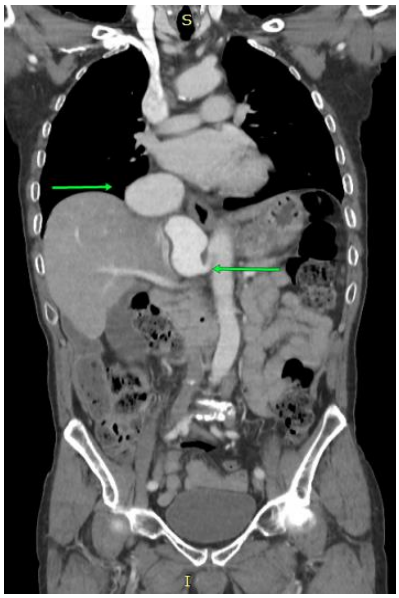

Figure 2. The coronal CTA (computed tomography angiography) view during the venous phase reveals a homogeneously enhancing vascular structure in the right lower lobe.

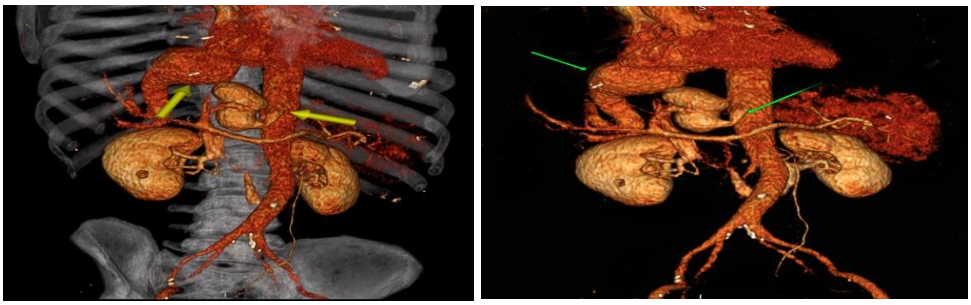

Figure 3(a). The 3D CTA reconstructions depicted in Figures 3a and b unveil a fusiform aneurysm along an aberrant systemic artery, arising from the suprarenal abdominal aorta and providing vascular supply to the right lower lobe. **Figure 3(b).** The 3D CTA reconstructions depicted in Figures 3a and b unveil a fusiform aneurysm along an aberrant systemic artery, arising from the suprarenal abdominal aorta and providing vascular supply to the right lower lobe.

Diagnosis

Intra- lobar sequestration supplied by an aberrant systemic artery from the abdominal aorta, and complicated by aneurysmatic dilatation.

Discussion

Pulmonary sequestration, a congenital anomaly, is distinguished by a bronchopulmonary segment with an atypical systemic arterial blood supply. Two primary variants exist: intra- lobar and extra- lobar. The former entails a lung segment enclosed within the standard visceral pleura and pulmonary parenchyma. Conversely, extra- lobar sequestration involves bronchopulmonary tissue located outside the visceral pleura and may be encapsulated within its pleural envelope.

Intriguingly, the diagnosis of intra- lobar sequestration is most commonly established in the pediatric population, exhibiting an equal prevalence across genders [1, 2].

However, it is noteworthy that this anomaly is rarely identified in individuals aged above 40 years [3]. Systemic arterial supply to the pulmonary parenchyma through an aberrant artery is also rare congenital anomaly, and the emergence of an aneurysm along this anomalous vessel is an exceptionally uncommon phenomenon [3, 4].

Our case study provides an in-depth exploration of a fusiform aneurysm associated with an aberrant systemic artery
supplying the right lower lobe, incorporating statistical data on epidemiology, symptoms, and treatment choices.

Statistical data on the epidemiology of systemic arterial anomalies with aneurysmal formations is scarce due to the rarity of such occurrences. However, the limited existing literature underscores the infrequency of this phenomenon, with only a handful of reported cases [5].

The incidence of aneurysmal dilatations along aberrant systemic arteries is notably low, emphasizing the uniqueness of our presented case.

In our case, the patient, a 69-year-old male, presented with vague abdominal pain, a symptom that, while nonspecific, led to the discovery of an unexpected vascular anomaly. Symptoms associated with systemic arterial anomalies can vary widely and may include chest pain, dyspnea, or even be asymptomatic

until a complication arises. Understanding the diverse clinical presentations is crucial for early detection and timely intervention.

The diagnostic journey began with ultrasound, revealing a dilated inferior vena cava (IVC) and a conspicuous sub-hepatic vascular structure. The subsequent CT angiography unveiled a bi-lobulated aneurysm of an aberrant artery, originating from the suprarenal abdominal aorta and supplying the right lower lobe. The imaging findings challenged conventional expectations, as the lung parenchyma and bronchial tree appeared grossly normal. The statistical rarity of such anomalies contributes to the diagnostic challenges, emphasizing the need for advanced imaging techniques for accurate visualization and diagnosis.

The management of fusiform aneurysms along aberrant systemic arteries necessitates a tailored approach, considering the unique anatomical and clinical characteristics of each case. In our scenario, the multidisciplinary collaboration played a pivotal role in determining the optimal treatment strategy. Treatment choices may include conservative management, endovascular interventions, or surgical resection, depending on factors such as the size of the aneurysm, the presence of symptoms, and the overall health of the patient [6,7].

Conservative management may be considered for asymptomatic cases with small aneurysms, involving close monitoring and lifestyle modifications. Endovascular interventions, such as embolization or stent placement, may be appropriate for select cases, offering a less invasive alternative [7].

Surgical resection becomes a viable option for larger aneurysms or those causing significant symptoms, involving the removal of the aberrant artery and reconstruction of the vascular network [6].

In conclusion, our case study sheds light on the statistical rarity, diverse symptomatic presentations, and diagnostic challenges associated with fusiform aneurysms along aberrant systemic arteries. The presented statistical insights highlight the scarcity of reported cases, emphasizing the need for heightened awareness among healthcare professionals.

The treatment choices for such rare vascular anomalies underscore the importance of individualized approaches, with a strong emphasis on multidisciplinary collaboration.

Conclusion

Intralobar sequestration coupled with aneurysm of an aberrant systemic artery is an extremely rare entity.

Accurate diagnosis through CT angiography plays a crucial role in guiding future successful surgical
intervention. This case contributes to the limited literature on such anomalies and emphasizes the importance of multidisciplinary collaboration for optimal patient care.

Consent

A written informed consent was obtained from the patient for publication of this case report and the accompanying images.

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