Aneurysm of the Suprahepatic Inferior Vena Cava: A Case Report

Gabriella Ghattas Mariano,[1] *Calina Araujo Thaines,*[1] *Gabrielle Silva Desani,*[1] *Letícia de Castro Gouvêa,*[1] *Paulo Vítor Cabral Covilo,*[1] *Rogério de Paula Garcia Caravante*[1]

Centro Universitário Católico Salesiano Auxilium,[1] *Araçatuba, SP – Brazil*

Introduction

Aneurysms of the inferior vena cava (IVC) are a rare occurrence in the cardiovascular system and can present with a variety of signs and symptoms. In many cases, patients remain asymptomatic, which makes diagnosis difficult.[1] Venous aneurysms are defined as an abnormal and persistent dilation of a vein in a specific area, with a diameter at least twice that considered normal. An IVC aneurysm is a specific type of venous aneurysm.[2] This case report is relevant because this condition is rare; by 2021, only around 70 cases had been described in literature.[3]

Aneurysms may arise due to fragility in the vessel wall and can be triggered by various factors, including hypertension, trauma, infection, and genetic conditions. Smoking, atherosclerosis, and chronic obstructive pulmonary disease are also considered risk factors for aneurysm development. Although they can occur in different regions of the body, they most frequently affect the cerebral arteries, the aorta, and the peripheral arteries.[4]

The clinical manifestations of aneurysms vary according to the size, location, and stability of the vascular dilation. They may even remain asymptomatic. However, in more severe cases, the vessel may rupture, resulting in hemorrhage, embolism, or thrombosis. These events may progress to fatal outcomes.[5] Among symptomatic patients with IVC aneurysm, the most frequently reported clinical findings include abdominal pain, lower limb edema (LLE), and dyspnea. Associated complications may include vena cava thrombosis, deep vein thrombosis (DVT), and pulmonary embolism, conditions that represent a significant risk to patients' lives.[6]

The objective of this study is to report a case of IVC aneurysm diagnosed in a private clinic in the city of Araçatuba, state of São Paulo, Brazil, classified as Type I because it is located in the suprahepatic portion of the IVC.[7] The clinical presentation, characterized by nonspecific manifestations as well as the diagnostic process and the follow-up strategy adopted, are highlighted.

Keywords

Aneurysm; Inferior Vena Cava; Cardiovascular Diseases; Case Reports.

Mailing Address: Rogério de Paula Garcia Caravante•
Centro Universitário Católico Salesiano Auxilium. Rodovia Teotonio Vilela, 3821. Postal code: 16016-500. Araçatuba, SP – Brazil
E-mail: rpgcaravante2011@gmail.com
Manuscript received August 4, 2025, revised manuscript October 29, 2025, accepted February 25, 2026
Editor responsible for the review: Tiago Magalhães

DOI: https://doi.org/10.36660/abcimg.20250055i

Case report

A 75-year-old White female patient sought care from a pulmonologist due to diffuse pain in the dorsal region and cough. Due to initial suspicions of a respiratory condition, a contrast-enhanced chest CT scan was requested. During the scan, a protruding sacular formation was identified in the upper quadrant of the abdomen.

The imaging examination demonstrated the presence of an IVC aneurysm in a suprahepatic location, classified as Type I according to the Gradman & Steinberg classification,[7] adjacent to the right atrium, without evidence of venous obstruction, measuring 4.2 cm at its greatest diameter. The cardiac silhouette was also observed to be of normal size, and the mediastinal vessels were centered, without other relevant abnormalities. These findings are illustrated in Figures 1 and 2.

According to the clinical history, the patient maintains a healthy lifestyle, with regular physical activity and a balanced diet, denying alcohol consumption and smoking. She was recently diagnosed with type 2 diabetes mellitus and is currently undergoing treatment. She reports a history of seizures during childhood and two vaginal deliveries in the second decade of life. Her surgical history includes appendectomy, gastroesophageal hiatoplasty, cholecystectomy, hysterectomy, oophorectomy, arthroplasty, and uterine curettage after an episode of ectopic pregnancy. In addition, she reports recurrent episodes of discomfort associated with palpitations throughout her life.

After the incidental finding, the patient was referred for cardiological evaluation and subsequently for consultation with a cardiovascular surgeon to undergo a more detailed investigation. At the time of the specialized evaluation, she was oligosymptomatic, presenting only persistent dorsal pain, which worsened with movement and improved with rest. On physical examination, slight abdominal prominence was observed, without pain on palpation, a finding consistent with the results of the previously performed imaging examination.

During follow-up, the patient presented significant improvement in pain after symptomatic treatment and remains under conservative clinical follow-up due to the stability of the condition. Currently, she undergoes periodic follow-up with a cardiovascular surgeon, with semiannual consultations and serial imaging examinations, with the objective of monitoring possible changes in the dimensions or characteristics of the IVC aneurysm.

Discussion

According to the classification proposed for IVC aneurysms, there are four forms of presentation (Figure 3). Type I

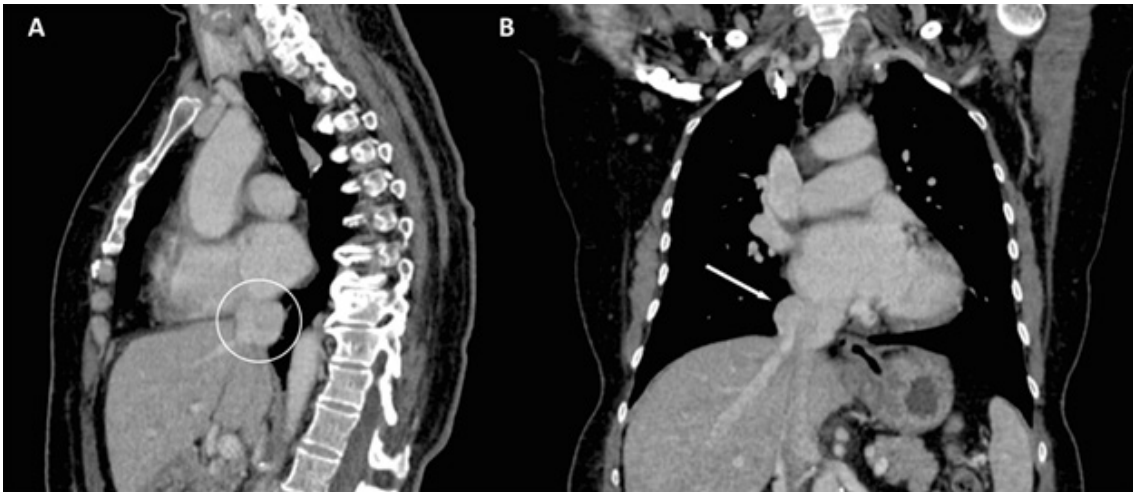

Figure 1 – *Chest CT. A) Chest CT with IV contrast administration, sagittal section, showing an IVC aneurysm (white circle); B) Chest CT with IV contrast administration, coronal section, demonstrating a suprahepatic IVC aneurysm adjacent to the right atrium (white arrow). CT: computed tomography; IVC: inferior vena cava.*

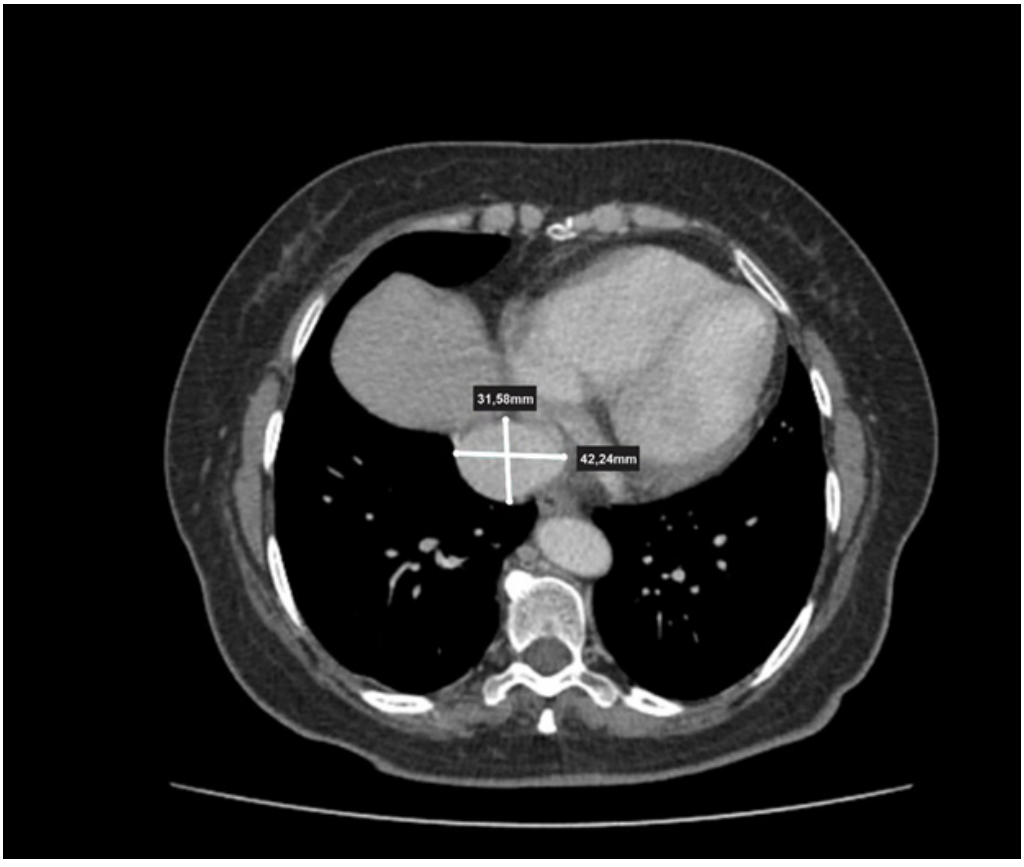

Figure 2 – *Chest computed tomography with IV contrast administration, axial section, showing an inferior vena cava aneurysm measuring 42.24 mm in the largest diameter and 31.58 mm in the smallest diameter (white lines).*

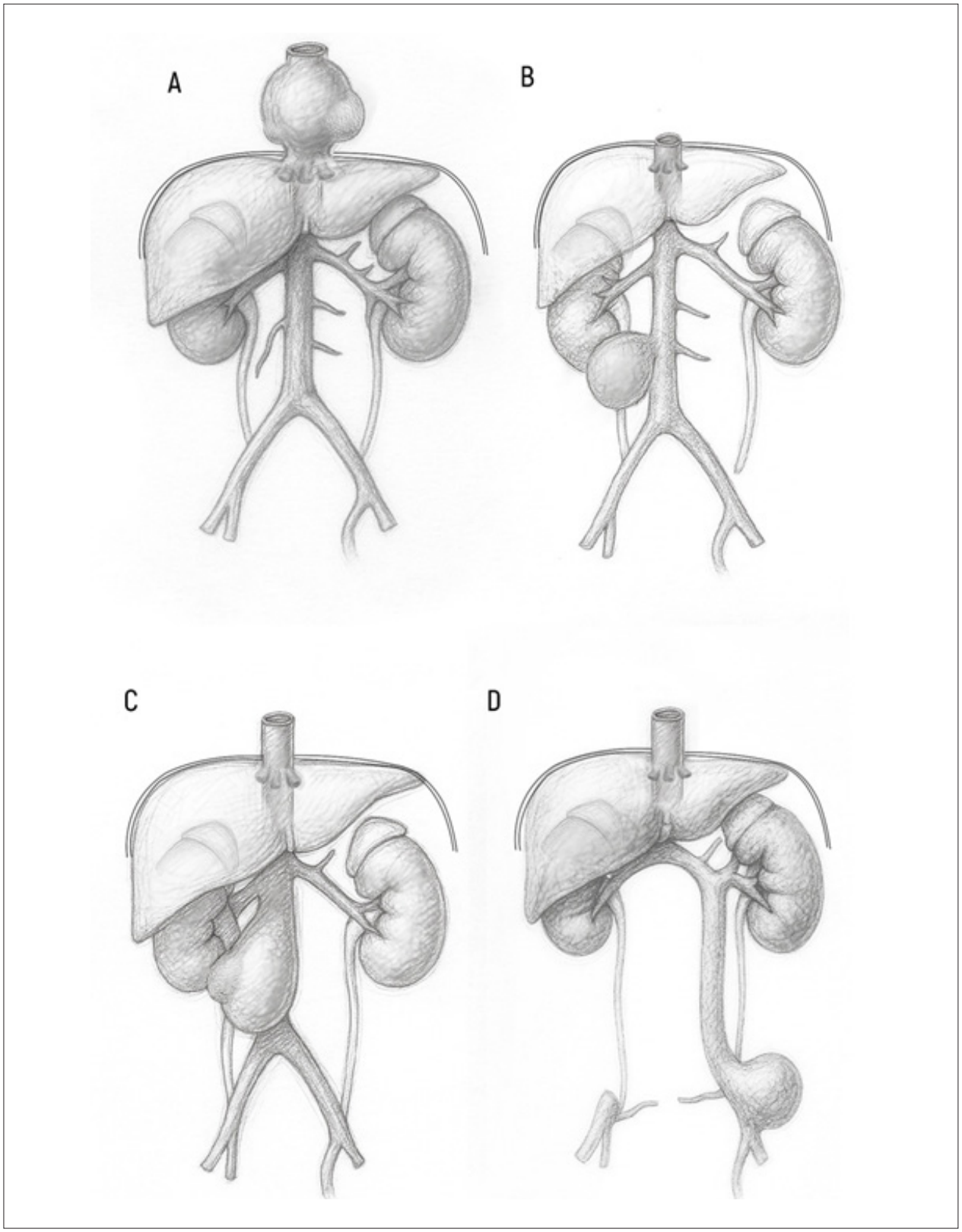

Figure 3 – *Schematic representation of the four types of IVC aneurysm. A) Type I: aneurysm located in the suprahepatic portion of the IVC, without obstruction of venous flow; B) Type II: infrarenal aneurysm associated with interruption of the suprahepatic segment of the IVC; C) Type III: aneurysmal dilation in the infrarenal region, without obstruction; D) Type IV: aneurysm involving the iliac vein, with the IVC positioned on the left side. Image adapted from Gradman & Steinberg.[7] IVC: inferior vena cava.*

corresponds to an aneurysm located in the suprahepatic portion of the IVC, without venous obstruction. Type II is associated with interruption of the IVC. Type III refers to an aneurysm located in the infrarenal portion of the IVC. Finally, Type IV corresponds to an aneurysm involving the iliac vein, associated with the presence of a left-sided IVC.[7] Based on this classification, the case presented was characterized as a Type I IVC aneurysm due to its suprahepatic location.

In the present report, the patient is female, 75 years old, and remained oligosymptomatic throughout her clinical history. Previous studies describe that most patients diagnosed with IVC aneurysm are male, with a mean age of 63.5 years among cases classified as Type I, with a large proportion of them being asymptomatic.[6] These data demonstrate that there may be variation in the epidemiological profile of individuals affected by this condition.

In this case, the diagnosis of IVC aneurysm was established after a chest CT scan. For the identification of this condition, imaging examinations constitute the main diagnostic method, particularly CT, magnetic resonance angiography, and venography, as they allow detailed evaluation of the morphology and characteristics of the venous aneurysm.[8] In the reported case, CT enabled precise visualization of the location, shape, and dimensions of the lesion.

Among the main complications associated with IVC aneurysm are rupture, DVT, pulmonary embolism, and IVC syndrome. Rupture occurs more frequently in aneurysms classified as Types II and III and may manifest with intense abdominal pain, dorsal pain, and LLE, leading to more severe clinical conditions.[9] Considering the classification of the aneurysm described in this report, Type I, as well as the patient's clinical history, no complications have been observed to date.

The literature describes abdominal pain, dyspnea, dorsalgia, LLE, and a sensation of heaviness in the lower limbs as the most common clinical manifestations in patients with IVC aneurysm. However, in aneurysms classified as Type I, asymptomatic or oligosymptomatic cases are more frequent.[6] In agreement with these findings, the patient in this report presented dorsalgia as the main clinical manifestation, which may be related to the identified aneurysm.

The treatment adopted in this case was conservative, with periodic clinical follow-up through physical examination and imaging studies, including CT performed every 6 months. This approach is consistent with the therapeutic algorithm proposed by Baker et al.,[5] which recommends conservative management with regular monitoring for IVC aneurysms classified as Type I. For Types II, III, and IV, the literature often indicates surgical intervention, such as embolization or resection, due to the higher risk of complications.[5]

Conclusion

Due to the scarcity of studies on the topic, the particularities described in this case may contribute to improving diagnosis and management in patients presenting with similar clinical features and symptoms. As a cardiovascular condition with possible systemic repercussions and often without evident clinical manifestations, IVC aneurysm may progress silently. Early identification is therefore essential for appropriate clinical management and follow-up.

Acknowledgments

We thank everyone who contributed, directly or indirectly, to the completion of this case report.

Author Contributions

Conception and design of the research, acquisition of data, analysis and interpretation of the data and writing of the manuscript: Mariano GG, Thaines CA, Desani GS, Gouvêa LCC, Covilo PV, Caravante RPG; critical revision of the manuscript for intellectual content: Caravante RPG.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any thesis or dissertation work.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Missão Salesiana De Mato Grosso under the protocol number 7.053.378 (CAAE 79880624.0.0000.5379). All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

Use of Artificial Intelligence

The authors did not use any artificial intelligence tools in the development of this work.

Availability of Research Data

The underlying content of the research text is contained within the manuscript.

References

1. Marsafi O, Ibenyahia A, Moussaoui A, Belmekia A, Wakrim S. Aneurysm of the Inferior Vena Cava : A Case Report. Ann Cardiol Angeiol. 2022;71(4):235-9. doi: 10.1016/j.ancard.2022.05.002.
2. Hai TD, Minh LN, Dung NT, Van Dung L, Tuong CT, Van Phuoc L. Large Intra-Abdominal Venous Malformations in Associated with Inferior Vena Cava Aneurysm. Radiol Case Rep. 2023;18(5):1733-7. doi: 10.1016/j.radcr.2023.01.085.
3. Chang H, Bae J, Chung TN. A Unique Case of Inferior Vena Cava Aneurysm Complicated with Pulmonary Embolism and Cerebral Infarction. J Cardiovasc Dev Dis. 2021;8(11):147. doi: 10.3390/jcdd8110147.

4. Brito CJ, Silva RM, Loureiro E. Cirurgia Vascular: Cirurgia Endovascular e Angiologia. 4th ed. Rio de Janeiro: Thieme; 2020.

5. Montero-Baker MF, Branco BC, Leon LL Jr, Labropoulos N, Echeverria A, Mills JL Sr. Management of Inferior Vena Cava Aneurysm. J Cardiovasc Surg. 2015;56(5):769-74.

6. Wang M, Wang H, Liao B, Peng G, Chang G. Treatment Strategies for Inferior Vena Cava Aneurysms. J Vasc Surg Venous Lymphat Disord. 2021;9(6):1588-96. doi: 10.1016/j.jvsv.2021.03.017.

7. Gradman WS, Steinberg F. Aneurysm of the Inferior Vena Cava: Case Report and Review of the Literature. Ann Vasc Surg. 1993;7(4):347-53. doi: 10.1007/BF02002888.

8. Duarte ML, Abreu BFBB, Silva AQPD, Prado JLMA, Silva MQPD. Idiopathic Inferior Vena Cava Aneurysm - Tomographic Diagnosis. Rev Port Cardiol. 2017;36(10):7812. doi: 10.1016/j.repc.2016.11.014.

9. Momeni M, Momeni F. Ruptured Inferior Vena Cava Aneurysm in the Setting of Mural Vascular Malformation: A Case Report. J Clin Ultrasound. 2019;47(7):423-5. doi: 10.1002/jcu.22708.