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## Inferior vena cava aneurysm presenting as deep vein thrombosis – A case report



Dr. Rajat Gusani (Assistant Professor)<sup>a,\*</sup>, Dr. Radha Shukla (MBBS)<sup>b</sup>,  
Dr. Sawan Kothari (MBBS)<sup>c</sup>, Dr. Ravi Bhatt (PGY1)<sup>d</sup>, Dr. Jayesh Patel<sup>e</sup>

<sup>a</sup> Shree Krishna Hospital, India

<sup>b</sup> H M Patel Centre for Medical Care & Education, India

<sup>c</sup> H M Patel Centre for Medical Care & Education, India

<sup>d</sup> Department of Surgery, Shree Krishna Hospital, India

<sup>e</sup> Vascular Surgeon, Shree Krishna Hospital, India

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### ABSTRACT

**INTRODUCTION:** Throughout history, venous aneurysms have seldom been heard of or even reported, especially since they have no specific symptoms unless complicated by their various manifestations, one being deep vein thrombosis.

**PRESENTATION OF CASE:** Here we report a case of a 33-year-old male patient who presented with idiopathic Deep vein thrombosis, and upon further investigation was found to have an IVC Aneurysm.

**DISCUSSION:** Thrombosis due to flow dynamics resulting in venous stasis is more prominent in Type II- IV IVC aneurysm, making their presentation as deep vein thrombosis common. Management of IVC aneurysm is highly controversial, with options of both medical and surgical interventions, each with its own merits and demerits.

**CONCLUSION:** Therefore, it is important to include IVC aneurysm as a differential when patients present with unprovoked DVT.

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## 1. Introduction

Venous aneurysms are uncommon in the medical field, especially those affecting the inferior vena cava (IVC). As per a 2008 literature review, IVC involvement was found only in 3 of 29 venous aneurysm cases reported. [1] IVC aneurysms are often asymptomatic. [2] However, when complicated, its presentation ranges from leg swelling, abdominal/lower back pain, DVT, massive penile bleeding, to severe complications such as ruptured aneurysm, pulmonary embolism and paradoxical cerebral embolism. [1]

## 2. Case report

A 33 year old male presented to Emergency/Trauma care center with 5 day history of localized pain and swelling over left lower extremity, which was sudden in onset, associated with increase in pain upon walking. On examination patient was vitally stable with a GCS of 15/15 with no systemic abnormalities. Local examination of the left lower limb revealed edema starting from toes to upper

part of the thigh associated with erythema, with no increase in temperature or gangrenous changes and no restriction on movement. Examination of right leg revealed presence of varicosities of great saphenous vein extending up to mid-thigh.

Upon investigating the patient, multi detector CT angiography was found to be normal. However, venography of abdomen and thighs revealed, thrombotic occlusion of deep veins of left thigh, with dilatation of left and right external iliac veins, left and right common iliac veins and commencement of IVC from the level of L4 vertebra and cranially upto its mid retrohepatic portion (Figs. 1 and 2). Venography also revealed prominent lumbar collaterals (right system involved more than the left one), with prominent azygous and hemi-azygous veins. Chest X-ray emerged clear. Upon color Doppler, there was fusiform dilatation of terminal IVC with intraluminal thrombus extending on the right side into the common and external iliac veins and on left side into iliac, femoral, and popliteal veins. Color Doppler also showed thrombosed terminal IVC aneurysm with left iliac and left lower limb deep vein thrombosis and thrombosed right iliac vein.

Patient was initially started on medical therapy that included: pain relievers (tramadol), antibiotics (amoxycillin + clavulanic acid, and cefadroxil), and anticoagulant (Heparin IV 5000 IU Stat which was followed by 1000 IU every 12 hourly). Patient was then advised catheter directed thrombolysis along with per cutaneous

\* Corresponding author at: Department of Surgery, Shree Krishna Hospital, Gokal Nagar, Karamsad, 388325, India.

E-mail addresses: [rgusani@gmail.com](mailto:rgusani@gmail.com), [r\\_gusani@hotmail.com](mailto:r_gusani@hotmail.com) (R. Gusani).

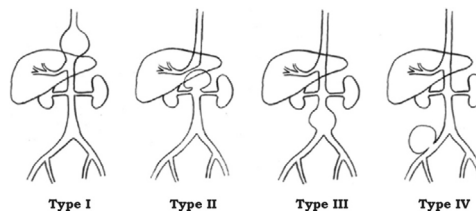


**Fig. 1.** Contrast imaging of the Aorto-Venous system showing dilatation of the Left External Iliac Vein and commencement of the IVC (L4-L5 Disc Level).



**Figs. 2 and 3.** Computerized Tomography of the Aorto-Venous system showing a dilatation of the IVC at body of L4 and disc space of L4-L5.

Mechanical Thrombolysis as a definitive cure for deep vein thrombosis caused by terminal IVC aneurysm. However, due to patient's personal preference, surgical intervention was deferred and patient opted for medical therapy. Patient was under observation until symptoms subsided. Upon discharge on sixth day, he was vitally



**Fig. 4.** Gradman and Steinberg Classification.

stable, with decreased edema, and reduced pain and advised to apply crepe bandage with upward stroking massage and elevation of limb, regularly at home. Medical therapy at home included Warfarin (5 mg once daily for 12 months), with regular follow-up every 3 months.

**3. Discussion**

Venous aneurysms being rare are defined as persistent isolated venous dilatation twice the normal diameter, with the normal range being 1.5–3.7 cm [1,3,4] The pathophysiological factors that cause IVC aneurysm include Trauma, Inflammatory Processes, Longstanding Hypertension and Congenital Defects. [5,6] As of 2007, 30 cases have been reported in a span of 40 years. [2] According to a recent literature review done by Montero-Baker et al. in 2014, 53 total cases of IVC aneurysm were reported, in addition to their own. This literature review was done to formulate a therapeutic algorithm for management of this rare clinical entity. [7]

Management of IVC aneurysm, despite being controversial, is highly dependent on its classification. Thompson and Lindenaur have classified IVC aneurysms based on its etiology, into congenital, acquired and secondary to arteriovenous fistula. [8] However this classification's utility is debatable as patient's status prior to admission is unknown in most cases. The other classification proposed by Gradman and Steinberg [9] has more functional utility as it is based on the aneurysm's relation to the hepatic vein and resultant obstruction (Fig. 3 ), as well as for prognostic value for the managerial aspect. [8]

Treatment options available include both medical and surgical interventions, each with their own merits and demerits. IVC Aneurysm per se has no specific medical management; drugs prescribed are either for symptomatic relief or towards prevention of further progression and complications. Montero-Baker et al., in their extensive review of 53 cases, recommend surgical treatment for all types of IVC aneurysms except type I, which can be managed conservatively. [7] Various surgical options include ligation, resection with end-end anastomosis, and resection with interposition graft. [10]

In the case discussed above, the 33 year old, male, patient presented with deep venous thrombosis, later diagnosed of having grade III IVC aneurysm. As per a 2014 literature review of IVC aneurysm, the mean age was 41 years and 62.5% were males. [7] Furthermore, vascular abnormalities along with ileocaval thrombosis were present in 20% of these patients. Thrombosis due to flow dynamics resulting in venous stasis is more common in Type II- IV IVC aneurysm. [7] In the review, there were 21 type III aneurysms, of which 14 aneurysms were resected, 6 were managed conservatively, and 1 underwent embolization. [7] Out of 21 cases, one that was managed conservatively died due to massive pulmonary embolus. [11] Therefore, as per the literature review, surgical intervention is the preferred treatment for type III aneurysms; however, conservative management had a satisfactory survival rate of 5/6. [7] Thus, for the current case, the definitive management would have been surgical resection of the aneurysm or thrombolysis followed with systemic anticoagulation. [12] Due to unfavorable

circumstances of the patient, surgical intervention was deferred and patient was counseled about medical treatment along with proper domiciliary care including physiotherapy. Patient was also informed about thrombotic complications, pulmonary embolism, and sudden death as a consequence of non-operative management. We are unable to comment on the patient’s outcome, due to failure of follow up.

This case study has been reported in line with the SCARE criteria. [13]

**4. Conclusion**

In conclusion, IVC aneurysms are rare with very few cases being reported.

However, Type II–IV IVC aneurysm presenting with Deep Vein Thrombosis is common. Thus, IVC aneurysm must be kept in mind when making a differential diagnosis of the etiology of DVT. Current guidelines suggest that Surgical Management is the preferred treatment of choice for IVC aneurysm; however medical management can play a role in the treatment of IVC aneurysm, as in the case discussed above.

**Conflicts of interest**

No conflict on interest.

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**Ethical approval**

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**Consent**

Consent obtained and submitted to HREC for ethics approval.

**Author contribution**

	Concept and Design	Case Interpretation	Paper Writing	Final Approval
Dr. Rajat Gusani				
Dr. Radha Shukla				
Dr.Sawan Kothari				
Dr. Ravi Bhatt				
Dr. Jayesh Patel				

**Registration of research studies**

N/A.

**Guarantor**

Dr. Rajat Gusani.

Dr. Radha Shukla Guarantor.

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