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Research Article

CONGENITAL ABSENCE OF INFRAHEPATIC IVC- A RARE PHENOMENON

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Abstract: ***Introduction:*** Inferior vena cava (IVC) occlusion may have widely varying clinical presentations that overlap with congenital IVC anomalies. Nevertheless, appropriate diagnosis, including differentiation from congenital absence, is mandatory. Endovascular therapy of chronic occlusions appears to yield results comparable to those of open repair.**Case report:** A twenty -five-year-old male having non-significant past history, presented with prescence of some prominent veins on anterior abdominal wall and right thigh for last few years. He has consulted some local private practitioners who re-assured him and advised for conservative approach. He was totally asymptomatic at time of presentation. All his biochemical profile including liver and renal function tests, lipid & thyroid profile, blood sugar, coagulation profile, viral screen, ECG and chest x-ray were essentially normal. The ultrasonogram abdomen showed prominent portal vein of 11 mm at porta hepatis with normal hepatopetal flow, along with few collateral channels in peri vesical region and anterior abdominal wall. The computed tomography abdominal angiography showed non-visualization of infra-hepatic IVC with prominence of azygos and hemiazygos veins. Many collaterals were seen in the region of the inferior Venacava, iliac vessels and anterior abdominal wall. As there was no history suggestive of DVT, hence anti-coagulants were not started. He was advised life style modifications like wearing medical-grade compression stockings, regular exercise, and elevating the legs intermittently while taking rest. Patient was advised cardiothoracic vascular consultation but later was lost to follow up.**Conclusion**- Congenital anomalies are rare and sometimes remain asymptomatic for prolonged period. Many of them are diagnosed as incidental findings on radiological investigations. Once, they are detected, then they merit detailed evaluation, including present and future impact on life. Thus, necessary and timely intervention should be done for decreasing overall morbidity and mortality.

Keywords: Infrahepatic, Inferior Venacava, Azygos vein, Hemiazygos vein, collaterals, Peri-umbilical veins

INTRODUCTION

Congenital absence of the infra-hepatic inferior vena cava (IVC) is a rare vascular anomaly where the middle segment of the main vein returning blood to the heart fails to develop. It forces blood to reroute through collateral pathways like the azygos system. While often asymptomatic, it is a significant risk factor for deep vein thrombosis (DVT) in young adults. The IVC is formed during the 4th to 8th weeks of gestation from complex networks of embryonic veins. The infra-hepatic segment specifically arises from the subcardinal vein and its connection to the liver. In case, right subcardinal-hepatic anastomosis fails to form or regresses, the infra-hepatic IVC is interrupted or completely absent, thus for bypassing this obstruction, venous blood from the lower extremities diverts into collateral veins. The most common alternate route is the azygos or hemiazygos vein, which enlarges to carry blood up to the superior vena cava and into the heart. Most individuals with this anomaly are entirely asymptomatic and go undiagnosed. It is typically discovered incidentally during unrelated imaging. However, it can present clinically through deep vein thrombosis (DVT) because the altered, slower hemodynamic and chronic venous stasis make patients highly susceptible to blood clots. It is a leading underlying cause of spontaneous, unprovoked DVT in patients under 30. The patients may also develop venous insufficiency in which there can be chronic leg edema, varicose veins, skin discoloration, or venous ulcers in the lower extremities. The diagnostic modalities include contrast-enhanced CT or MRI which are the non-invasive modalities of choice, clearly showing the absence of the IVC, dilated collateral veins (like the azygos), and patent renal veins. Doppler Ultrasound is useful for diagnosing thrombosis but often fails to trace the full, deep course of the IVC. Management focuses on preventing or treating complications like DVT rather than correcting the anomaly itself. Thromboprophylaxis is given if DVT occurs, or if the anomaly is discovered alongside other clotting disorders, patients may require anticoagulation therapy. Some younger patients with spontaneous clots may require long-term or indefinite therapy. Lifestyle modifications for reducing venous stasis such as wearing medical-grade compression stockings, regular exercise, and elevating the legs are highly recommended.

Case Report

A twenty -five-year-old male having non-significant past history, presented with prescence of some prominent veins on anterior abdominal wall and right thigh for last few years. He has consulted some local private practitioners who re-assured him and advised for conservative approach. He was totally asymptomatic at time of presentation. All his biochemical profile including liver and renal function tests, lipid & thyroid profile, blood sugar, coagulation profile, viral screen, ECG and chest x-ray were essentially normal. The ultrasonogram abdomen showed prominent portal vein of 11 mm at porta hepatis with normal hepatopetal flow, along with few collateral channels in peri vesical region and anterior abdominal wall. The computed tomography abdominal angiography showed non-visualization of infra-hepatic IVC with prominence of azygos and hemiazygos veins. Many collaterals were seen in the region of the inferior Venacava, iliac vessels and anterior abdominal wall. As there was no history suggestive of DVT, hence anti-coagulants were not started. He was advised life style modifications like wearing medical-grade compression stockings, regular exercise, and elevating the legs intermittently while taking rest. Patient was advised cardiothoracic vascular consultation but later was lost to follow up.

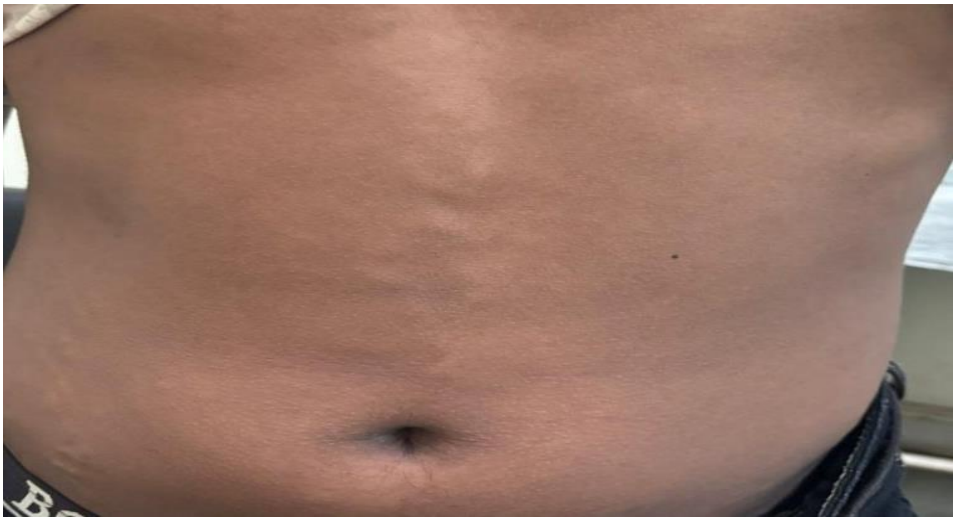

FIGURE 1- Showing multiple abdominal veins formed due to collateral circulation

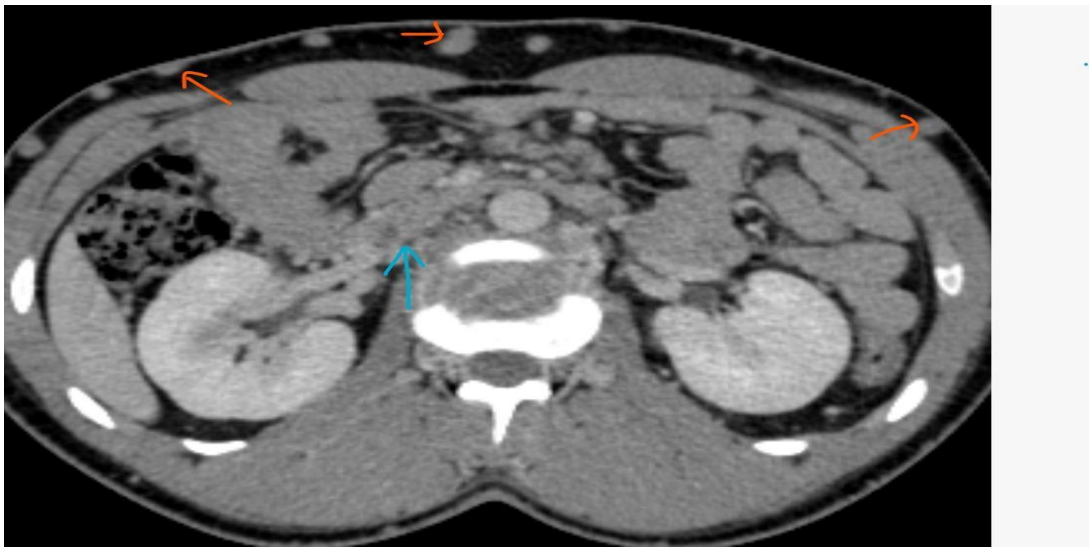

Figure 2- CT Scan abdomen showing non-visualization of infra-hepatic inferior vena cava (blue arrow) which is replaced by multiple collaterals in anterior abdominal wall (orange arrows)

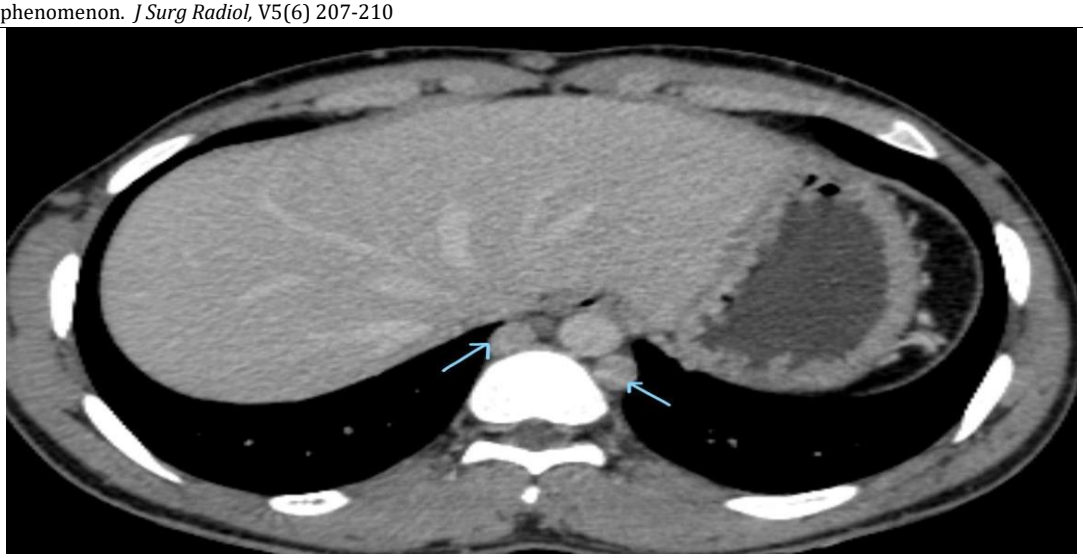

Figure 3- CT Scan Abdomen showing prominent Azygous and Hemiazygous veins (blue arrows)

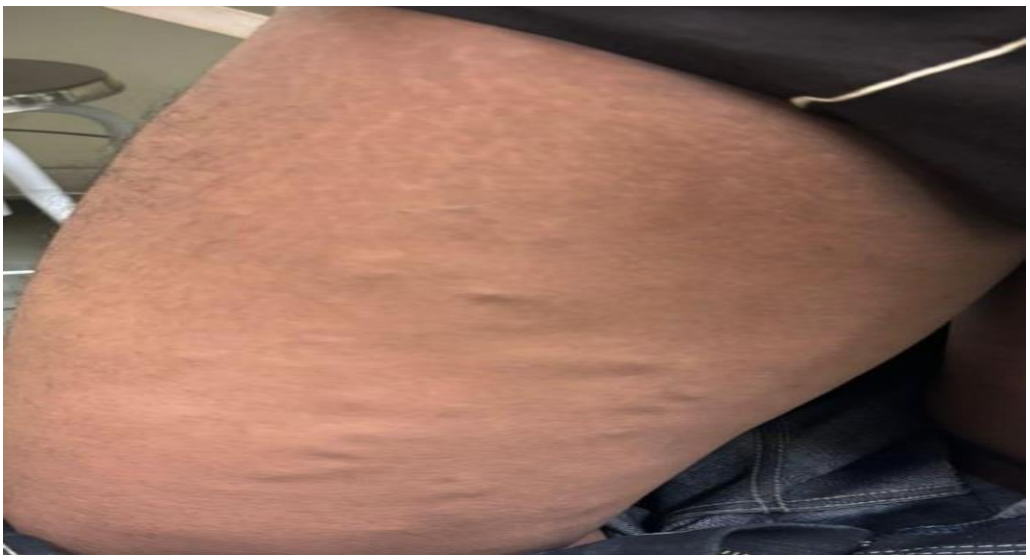

FIGURE 4- Showing prominent veins in thigh due to absent Infrahepatic IVC

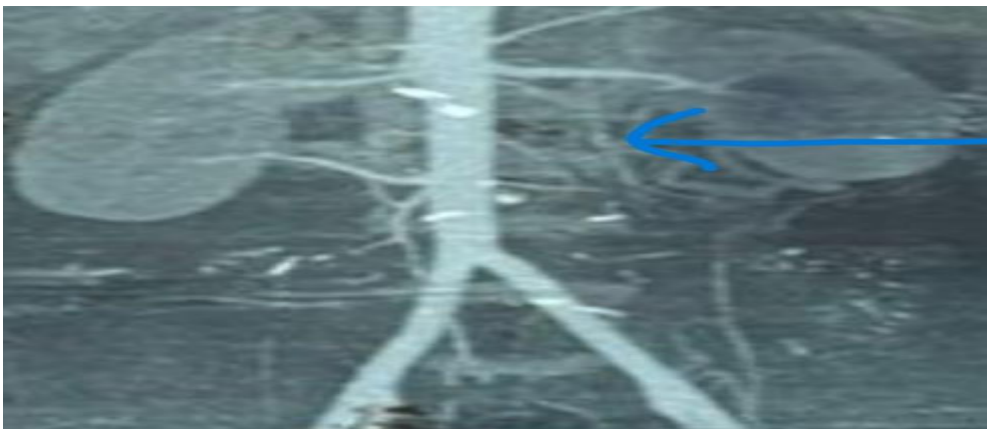

Figure 5- Aorto-venogram showing multiple collaterals (blue arrow)

DISCUSSION

In a recent study, the prevalence of interruption or congenital stenosis of the inferior vena cava (IVC) was found to be 0.15%. [1] Embryological formation of IVC occurs between the fourth and eighth weeks of gestation; this period coincides with the development of most organs (spleen, liver, heart, and lungs). Thus, it is not surprising to have asplenia, polysplenia, situs inversus,

con- genital heart disease, lung and kidney malformation associated with IVC anomalies. [2] It is also suggested that absence of the infrarenal segment of the IVC is not embryonic in origin, rather the result of intrauterine or perinatal thrombosis. [3,4] Chronic inferior vena cava (IVC) obstruction has diverse presentations, ranging from clinical silence or self- limiting lower extremity edema and pain to more severe manifestations, such as venous claudication, acute distal venous thrombosis, venous ulceration, and even hepatic or renal insufficiency. [5,6] The presentation of congenital absence of the IVC is similarly varied. [7,8] Although there may be overlap in the treatment of symptomatic cases of occlusion and congenital absence, they are not identical in all cases. Furthermore, IVC absence should prompt examination for associated anomalies (e.g. cardiac defects), while occlusion requires an investigation into potential etiologies. [9] Congenital anomalies of the IVC, including absence, in healthy patients are unusual (0.3%-0.5%); diagnosis of these conditions should be made carefully and only after venography and attempted recanalization of the native IVC. [10] Our case was also diagnosed while being investigated for prominent veins on anterior abdominal wall and lower limb which were collaterals formed due to absence of infra-hepatic IVC. He was lucky that still he had not developed any DVT and was clearly explained about necessary life-style modifications.

CONCLUSION

Congenital anomalies are rare and sometimes remain asymptomatic for prolonged period. Many of them are diagnosed as incidental findings on radiological investigations. Once, they are detected, then they merit detailed evaluation, including present and future impact on life. Thus, necessary and timely intervention should be done for decreasing overall morbidity and mortality.

CONFLICT OF INTEREST- The authors declare that there was no conflict of interest and consent was taken from patient as well as parents before publishing this case report.

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