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Duodenal Perforation by Inferior Vena Cava Filter. A Rare Cause of Recurrent Abdominal Pain

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1. Abstract

A 32-year-old male presented with recurrent abdominal pain for two years. Esophagogastroduodenoscopy revealed duodenal wall penetration by a metallic foreign body, subsequently identified via computed tomography as an inferior vena cava (IVC) filter strut. A past medical history suggested IVC filter placement during pediatric trauma management. Successful extraction was achieved utilizing a laser-assisted endovascular retrieval technique. This unusual etiology of recurrent abdominal pain underscores the necessity for vigilance regarding delayed complications of indwelling vascular devices and emphasizes the critical importance of systematic follow-up protocols for IVC filters to prevent potentially serious sequelae.

2. Introduction

An inferior vena cava filter is recommended by the American Society of Hematology guidelines in case of deep vein thrombosis where anticoagulant is contraindicated [1]. The probability of inferior vena cava filter complications ranging from 1.8% to 22% [2,3]. One of the rare but serious complications is IVC perforation [4]. It has a wide range of presentations based on injured organs such as duodenum, aorta, psoas muscle, ureter or liver [5-7]. While IVC filter perforation is often asymptomatic, it can potentially lead to severe consequences such as gastrointestinal bleeding, aortic erosion, or fistula formation if adjacent organs like the duodenum or aorta are involved [8,9]. A high index of suspicion is required to diagnose IVC filter perforation, as patients may present with non-specific symptoms like abdominal pain, and imaging modalities like CT scans are crucial for the detection and evaluation of this complication [10]. The general recommendation is to remove the IVC filter as soon as possible. Here we report an interesting case of recurrent abdominal pain.

3. Case Report

A 32-year-old male denying any medical illness with a past surgical history of laparoscopic cholecystectomy 8 years ago. Patient presented with a history of recurrent upper abdominal pain for 2 years. Laboratoy tests, including complete blood count and comprehensive metabolic panel, were unremarkable except for beta thalassemia trait. Upper gastrointestinal endoscopy performed in our hospital revealed a foreign body in the proximal third part of the duodenum, described as a duodenal wall penetrating metallic object with a U shape, along with localized inflammation and granulation tissue of duodenal mucosa in contact with the tip of metallic foreign body (Figure 1). The patient denied any ingestion of foreign bodies. Subsequently, CT abdomen was ordered and showed caval perforation by infra-renal IVC filter's struts protruding through the IVC into the proximal third part of the duodenum (Figure 2&3). Further inquiry of the patient's medical history from his mother revealed a history of admission for several weeks in his childhood due to a road traffic accident with multiple lower limb fractures. Without precise details or medical reports. The patient was admitted to our hospital for the extraction of the IVC filter, necessitating the expertise of an interventional radiologist. The removal procedure, initially planned through a right internal jugular vein puncture, employing intricate techniques like a loop snare, grasping forceps and multi-loop snare was halted due to the presence of a fibrin sheath around the filter, complicating its extraction. Subsequently, the patient was transferred to another hospital, where the IVC filter was successfully removed by Interventional radiology using a spectranetics laser sheet. The patient was discharged home ambulatory after 48 hours of observation.

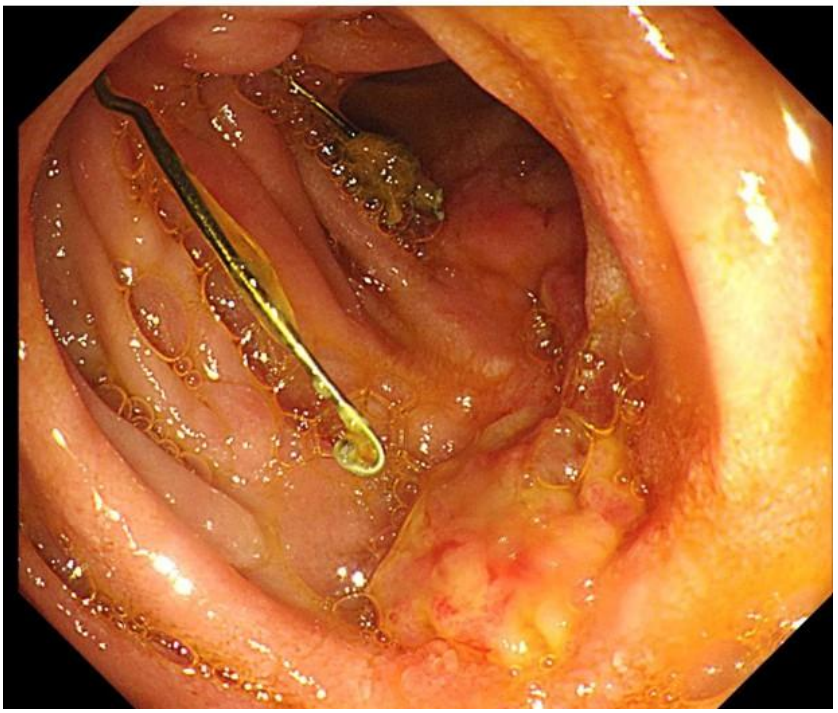

Figure 1: Esophagogastroduodenoscopy revealing a metallic foreign body with a U shape penetrating the duodenum with localized inflammation and granulation tissue.

Figure 2: CT abdomen coronal view showing caval perforation By IVC filter.

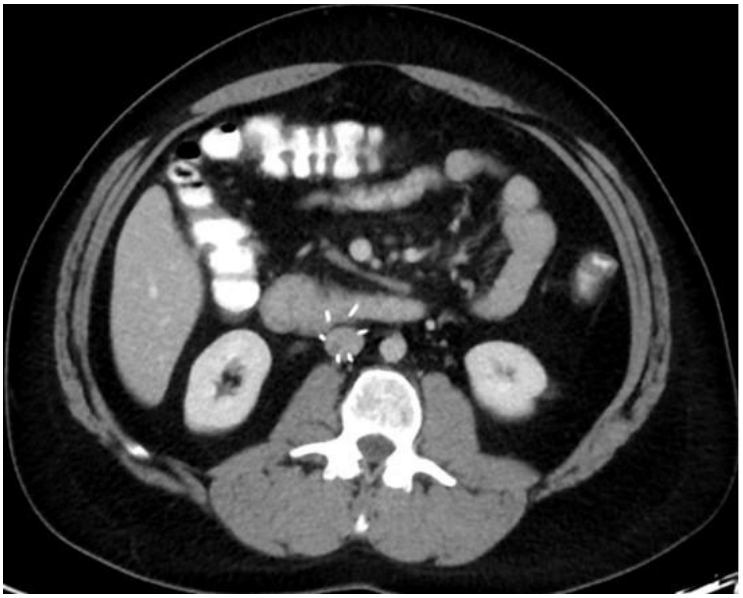

Figure 3: CT abdomen axial view showing IVC filter struts perforating into the proximal third part of the duodenum.

4. Discussion

The number of cases of IVC filter insertion is increasing but rarely retrieved, with the estimation of only 12% to 18% [11,12]. In a single center in the Kingdom of Saudi Arabia with a total of 382 IVC filters inserted, the rate of retrieval was only (32.5%), with the most common reason for non-retrieval being the need for permanent filtration (60%) [13]. Indications of IVC filter insertion include recurrent VTE despite adequate anticoagulation, inability to achieve/maintain adequate anticoagulation, contraindication to anticoagulation (e.g., allergy, planned major surgery), and complication of anticoagulation (e.g., hemorrhage), in addition to several relative indications in patients with proven VTE and prophylactic indications in patients without VTE [14]. The main risk factors for developing duodenal perforation were an extended duration of insertion, filter migration, and the type of filter. Celect filters have been reported to cause a higher rate of perforation than G2 filters [8,10,15,16]. In a systemic literature review of 1699 patients with caval penetration by IVC filters, only 8% were symptomatic. Usual symptoms vary from mild symptoms like abdominal pain, nausea and vomiting to serious symptoms like fever and chills, GI bleeding, and small bowel obstruction [17]. It is important to note that IVC filter perforation of the duodenum is rare, and the exact mechanism of perforation is not fully understood. However, being mindful of these risk factors is crucial for the timely identification and management of this rare complication.

5. Conclusion

A forgotten IVC filter imposes a challenging and unique presentation. Most patients are asymptomatic or with non-specific symptoms. Nonetheless, it confers a high morbidity and worsens the quality of life. We encourage an organizational workflow to ensure all patients with IVC filters are followed regularly.

References

1. Lyman GH, Carrier M, Ay C. American Society of Hematology 2021 guidelines for management of venous thromboembolism: Prevention and treatment in patients with cancer. Blood Advances. 2021; 5(4): 927-974.
2. Ramakrishnan G, Willie-Permor D, Yei K. Immediate and delayed complications of inferior vena cava filters. Journal of Vascular Surgery: Venous and Lymphatic Disorders. 2023; 11(3).
3. Wassef A, Lim W, Wu C. Indications, complications and outcomes of inferior vena cava filters: A retrospective study. Thrombosis Research. 2017; 153: 123-128.
4. Rasuli P. Inferior vena cava penetration by Günther Tulip Filter? Journal of Vascular and Interventional Radiology. 2013; 24(5): 752.
5. Wang W, Zhou D, Obuchowski N, Spain J, An T, Moon E. Fracture and migration of Celect inferior vena cava filters: a retrospective review of 741 consecutive implantations. J Vasc Interv Radiol. 2013; 24(11): 1719-1722.
6. Malgor RD, Labropoulos N. A systematic review of symptomatic duodenal perforation by inferior vena cava filters. J Vasc Surg. 2012; 55(3): 856-861.e3.
7. Abosheaishaa H, Saha U, Abdelhalim O, Al-Howthi N, Elhawary A, Abusuliman M. Upper gastrointestinal bleeding secondary to duodenal wall perforation by inferior vena cava filter: a rare clinical presentation. Cureus. 2023; 15(11): e48448.
8. Jehangir A, Rettew A, Shaikh B. IVC filter perforation through the duodenum found after years of abdominal pain. Am J Case Rep. 2015; 16: 292-295.
9. Grewal S, Chamarthy MR, Kalva SP. Complications of inferior vena cava filters. Cardiovascular Diagnosis and Therapy. 2016;6(6):632-641.
10. Jha KK, Thakur LK, Jha S. Duodenal perforation by an inferior vena cava filter. BMJ Case Reports. February. 2017.

11. Brown JD, Raissi D, Han Q, Adams VR, Talbert JC. Vena Cava Filter Retrieval Rates and Factors Associated with Retrieval in a Large US Cohort. J Am Heart Assoc. 2017; 6(9): e006708.
12. Morris E, Duszak R Jr, Sista AK, Hemingway J, Hughes DR, Rosenkrantz AB. National Trends in Inferior Vena Cava Filter Placement and Retrieval Procedures in the Medicare Population Over Two Decades. J Am Coll Radiol. 2018; 15(8): 1080-1086.
13. Shabib AB, Alsayed F, Aldughaythir S. Indications, retrieval rate, and complications of inferior vena cava filters: Single-center experience in Saudi Arabia. Ann Thorac Med. 2018; 13(2): 108-113.
14. Harvey JJ, Hopkins J, McCafferty IJ, Jones RG. Inferior vena cava filters: what radiologists need to know. Clin Radiol. 2013; 68(7): 721-732.
15. Zhu X, Tam MD, Bartholomew J, Newman JS, Sands MJ, Wang W. Retrievability and device-related complications of the G2 filter: a retrospective study of 139 filter retrievals. J Vasc Interv Radiol. 2011; 22(6): 806-812.
16. Zhou D, Spain J, Moon E, Mclennan G, Sands MJ, Wang W. Retrospective review of 120 celect inferior vena cava filter retrievals: experience at a single institution. J Vasc Interv Radiol. 2012; 23(12): 1557-1563.
17. Jia Z, Wu A, Tam M, Spain J, McKinney JM, Wang W. Caval penetration by inferior vena cava filters. Circulation. 2015; 132(10): 944-952.