

Key Words

IVC filter, laser sheath removal

Abstract

Inferior vena cava filters are an important alternative to pharmacologic anticoagulation therapies, though they possess potential for substantial adverse effects. The case presented here describes the clinical course of a 35-year-old female that presented with symptoms related to significant penetration of the lumbar spine by a previously placed IVC filter that was subsequently removed by interventional radiology.

Introduction

Though relatively new on the scene, inferior vena cava (IVC) filters have become an invaluable tool for the management of thromboembolic disease 1. Despite its clinical utility however, IVC filters are also prone to several complications such as filter fracture (2-10%), IVC occlusion (2-30%), and IVC penetration (0-41%)². It should be noted that though IVC penetration is reported to occur in as high as 41% of cases, clinically significant penetration is a rare complication, with only an approximate reported rate of 0.4%². This is where the significance of this case lies, as it describes a unique case of an IVC filter that penetrated the spine and began to cause notable clinical symptoms, prompting what eventually became a multidisciplinary investigation.

Spinal Intrusion by an IVC filter

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Clinical Timeline

This is a 35-year-old female that initially presented in 2023 with the complaint of significant low back pain and left leg pain. Relevant past medical history includes a motor vehicle collision in 2006 that required femur fracture repair and a subsequent left leg DVT that required IVC filter placement.

In March 2023, the patient presented for a stroke-like episode. At the time, she was also diagnosed with a possible left internal carotid artery dissection by CT and was subsequently seen at a vascular institute. However, she presented with left upper and lower extremity weakness, which was not attributed to the possible internal carotid artery dissection. Due to the discrepancy in findings, other potential sources for her back pain were sought. This led to imaging of her spine and the subsequent findings concerning the then 16-year-old IVC filter were noted and follow up with neurosurgery was recommended.

In November 2023, the patient was seen by neurosurgery to assess the erosion of the IVC filter, and the cystic vertebral lesion associated with it, and it was recommended that the filter be removed to prevent potential further erosion and other future consequences. In the following weeks, interventional radiology was consulted and IVC filter retrieval with laser sheath removal was discussed with the patient and a plan was created to schedule the procedure.

In January 2024, the patient presented to interventional radiology for IVC filter retrieval, and the procedure was successfully performed.

Relevant figures and images



Figure 1. Lateral view demonstrating significant filter strut penetration and formation of cystic lesion







Figure 3. Gross images of the 17-

year-old IVC filter removed in its

entirety. The filter appears to be

covered with residual endothelial

tissue and other particulate matter

from years of stay in the IVC.

Discussion

With any medical intervention, the risk to benefit ratio is often a major consideration that guides clinical decision-making. In the case of venous thromboembolic disease, decisions for therapeutic intervention can be critical in preventing mortality. However, careful consideration is warranted for the use of inferior cava filters in this regard, as guidelines for their proper use have historically been controversial and have significantly evolved since their introduction to medical practice. Combined with other factors, this has led to notable variation in their use across hospitals and a general decrease in use over recent years ^{3,4,5}.

The importance of filter retrieval related to placement or in-dwelling complications, must not by any means, however, be underscored by the long-term clinical outcomes associated with filter retrieval. For example, filter retrieval has been shown to be associated with post-filter venous thromboembolic disease as well as the development of post-thrombotic syndrome ^{6, 7}. Still, in-dwelling filter related complication rates may significantly outweigh the burden of filter retrieval related complications, and therefore there is an increased preference for early retrieval ⁸. In addition, it should be noted in this regard that laser-sheath assisted retrieval, especially as it is of specific interest in this case, has been found in meta-analysis studies to have an astounding average technical success rate of over 96% 9. In this patient's case. long term follow up will be necessary to monitor the course of the radiographic changes related to the 17 years of placement of the filter, and to truly assess the clinical improvement as well as any post-filter

References will be provided upon request



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