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CASE REPORT

Endovascular management of IVC syndrome after IVC filter placement

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Abstract Approximately 60 000–100 000 Americans die from deep venous thrombosis or pulmonary embolism annually, while the overall estimate of individuals affected is 30 000–600 000. Inferior vena cava (IVC) filter placement has emerged as a break-through endovascular technique which has gained increasing acceptance and has probably saved thousands of lives by preventing fatal thromboembolic events. However, in the absence of a national IVC filter registry an accurate estimate of device complications is currently unavailable.

We present a case of symptomatic IVC syndrome due to IVC interruption in a patient with a non-retrievable IVC filter. This patient was initially managed with balloon angioplasty and mechanical thrombectomy with suboptimal results and subsequently with stent placement through the IVC filter.

PALAVRAS-CHAVE
Filtro na VCI;
Síndrome de VCI;
Tratamento endocascular

Tratamento endovascular da síndrome da veia cava inferior após colocação do filtro da veia cava inferior

Resumo Cerca de 60 000 a 100 000 americanos morrem anualmente de trombose venosa profunda (TVP) ou de embolia pulmonar (EP), sendo a estimativa global de doentes afetados de 300 000 a 600 000. A colocação do filtro na veia cava inferior (VCI) surgiu como uma técnica endovascular inovadora que tem ganho uma aceitação crescente e tem salvo provavelmente milhares de vidas de eventos tromboembólicos fatais. Contudo, devido à falta de um registo nacional de filtros de VCI, não está atualmente disponível uma estimativa precisa das complicações do equipamento.

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Apresentamos um caso de uma síndrome de VCI sintomática devida à interrupção da VCI num doente com um filtro de VCI não recuperável. Este doente foi inicialmente tratado com angioplastia por balão e trombectomia mecânica com resultados suboptimizados e posteriormente com implantação de *stent* através de um filtro na VCI.

Introduction

According to a Centers for Disease Control and Prevention report, approximately 60 000–100 000 Americans die from deep venous thrombosis (DVT) or pulmonary embolism (PE) annually, while the overall estimate of individuals affected is 30 000–600 000.[1] Of those affected, 33% will have a recurrence within the next 10 years. The mainstay of DVT/PE treatment today is anticoagulation; however, many patients do not qualify for anticoagulation due to important comorbidities such as bleeding diathesis, active gastric ulcers, or frequent falls.

The prevention of PE in patients with lower extremity DVT by surgical interruption of the inferior vena cava (IVC) was first suggested by Trousseau in 1868 and was successfully performed by Bottini in 1959.[2] The first mechanical IVC filter (Mobin-Uddin) was used in 1967 as a novel device that would trap larger thrombi migrating from the deep venous system of the lower extremities to the pulmonary arteries.[3] Today the endovascular placement of IVC filters has become a simple and safe routine endovascular procedure.

According to the 2012 American College of Chest Physicians guidelines, the use of an IVC filter is indicated in patients with acute proximal DVT of the leg and contraindication to anticoagulation (grade 1B).[4] An accurate number of IVC filter implantations in the US is currently unavailable despite an attempt by the American Venous Forum to form an IVC registry.[5] It is estimated that approximately 259 000 IVC filters were implanted in 2012.[6]

Safety of inferior vena cava filters

The use of IVC filters has increased in recent years due to their ease of use and proven clinical benefits in selected patient populations. However, in 2010 the US Food and Drug Administration (FDA) recommended that ''implanting physicians and clinicians responsible for the ongoing care of patients with retrievable IVC filters consider removing the filter as soon as protection from PE is no longer needed''. This recommendation resulted from 921 device adverse event reports including migration, embolization of device components, venous perforation and IVC filter fracture.[8] An accurate estimate of IVC filter complications in the US is currently unavailable as most of these adverse events are clinically silent.

The British Society of Interventional Radiology Inferior Vena Cava (IVC) Filter Registry was created to assess current practice in the UK and to address safety concerns. In their report on 1434 IVC filter placements the rate of complications was 3.5%.[7]

Therefore, the overall risk of IVC obstruction after filter placement is unknown.

Endovascular management of inferior vena cava filter obstruction

Endovascular techniques to treat deep venous system stenosis or obstruction have attracted increasing interest over the last decade. Large series of obstructive lesions in the IVC treated percutaneously with angioplasty or stenting have demonstrated the safety of the technique and excellent stent patency (82% in two years) with significant symptomatic relief of swelling, pain and ulcer formation.[9]

Stenting of occluded IVC filters was reported in a large case series of 708 patients with stenting due to post-thrombotic iliocaval outflow obstruction. In their observational study Neglén et al.[9] reported 25 cases of IVC filter occlusion which were successfully managed with stent placement across the IVC filter. In all these cases the IVC filter was significantly displaced or deformed. There were no perioperative complications. In patients with stenting through the IVC filter, 54-month secondary stent patency was slightly lower (74%) than in the other procedures (86%). However logistic regression analysis associating patency rates and occlusive disease demonstrated that patency was not associated with stenting of the IVC filter but with the severity of post-thrombotic disease.[9]

Case report

A 64-year-old Caucasian female with prior history of lower extremity DVT, post-thrombotic syndrome, venous insufficiency and recent IVC filter placement was referred to our clinic with worsening leg swelling, pain and non-healing ulcers bilaterally. Her past medical history was significant for hypertension, hyperlipidemia, seizure disorder and chronic obstructive pulmonary disease. She had a previous hysterectomy, cholecystectomy and colon repair, which were all reportedly uncomplicated.

Her physical examination revealed bilateral telangiectasias, reticular and varicose veins with worsening edema which reportedly increased from the ankle area to the mid calf, and skin pigmentation changes to the mid-lower calf areas. Chronic lipodermatosclerosis had already been noticed in the medial ankle areas, associated with worsening chronic venous ulcers lower on the medial ankle. The ulcers were tender, shallow and exudative with a granulation base