Case report for Capturex® Retrievable Inferior Vena Cava (IVC) filter


Introduction:
Cancer is a well-known risk factor for developing Venous Thromboembolism (VTE). Temporary filters (i.e. filters that have the “option” of being retrieved) have been available since the late 1990’s and are designed to be retrieved or left in place after the temporary risk of PE or contraindication to anticoagulation has resolved [1]. Temporary filters might be placed for prophylactic indications in patients who are at increased risk for the development of VTE such as in the trauma setting or during the high VTE risk operation [2;3]. Venous migration and tumor thrombus formation are unique aspects of renal cell carcinoma (RCC) [4]. Patients diagnosed with RCC have involvement of the inferior vena cava (IVC) in up to 35% of cases [5]; specifically thrombosis has been reported to occur in 4%-10% of patients with renal neoplasms. [6] Within this group, 2%-16% have tumors extending into the right atrium [7]. The level of tumor thrombus in the IVC does not significantly affect long-term survival [8]. Once a future perspective, now commonly available retrievable IVC filters are chosen for complicated clinical cases [9]. In July 2013 Straub Medical (Wangs, Switzerland) announced the commercial launch of the CE Mark-approved Capturex® vascular protection system in selected European markets. Capturex® is indicated for the prevention of massive thrombus embolization during embolizing-potential endovascular procedures [10]. Data from 2018 supports the effectiveness of preoperative temporary IVC placement to prevent thrombo-embolism and to improve surgical safety [11]. The Capturex® vascular protection system may offer a safe and effective protection device during removal of thrombosed IVC filters or during mechanical thrombectomy [12].
**Description of Case**

74 years old male with fatigue and back pain, abdominal CT scan demonstrated tumor in the left kidney (Fig. 1. Arrow No. 1).

Diagnosed with prostate cancer in 2017. Treatment started with hormone therapy, planned to add radiation therapy. (Ca renis sin. cT3 N0 M0. Ca gl. prostatae). Bioprosthetic aortic valve replacement surgery in 2018.

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![Figure 1. CT scan shows tumor in the left kidney.](image1)

![Figure 2. IVC thrombosis extending up to right atrium.](image2)

IVC thrombosis extending up to right atrium (Fig. 2. Arrow No 2). No metastasis or other abnormalities were found in the lungs.
During further medical examination, Cardiac Ultrasound was performed which showed bioprosthetic aortic valve, with mild - to moderate calcinosis of valvular ring. The diameter of the chambers of the heart were in the normal range. There was normal systolic function of both left and right ventricles. A mild degree of insufficiency in the mitral and tricuspid valves was observed. No hypertension in the pulmonary artery was observed. Hematologist consultation - Anaemia ferodeficitica (evidence for haemolytic anemia is insufficient, no other abnormalities were observed).

Abdominal Ultrasound right before surgery and angiography - IVC ~7,5 cm thrombus, extending to right atrium, hepatic veins confluence.

**Description of Procedure**

Patient was operated in the hybrid OR on 10/08/2018. First, a right trans jugular approach was made and a 0.018” Guidewire was inserted into the Capturex® (Arrow No 5). An introducer sheath ≥ 10F is required for the procedure. A pre-deployed IVC filter (Arrow No 3) and Central Venous Catheter, CVC (Arrows No 4) is seen.
The Capturex® filter was deployed just above the thrombus at the level of confluence of IVC and right atrium (Arrows No 5, 6).

Subsequently, using transperitoneal “chevron” laparotomy, a left nephrectomy was performed together with thrombectomy from the IVC with primary suture of venotomy. Early postoperative period was complicated by pneumonia that was cured with cefuroxime. Capturex® was removed with no evidence of debris on the struts, indicating that the thrombectomy removed 100% of the thrombus.

Total hospitalization time - 12 days. Patient set off to rehabilitation full recovery.

**Rationale for treatment with the Capturex® Vascular Protection System**

In this clinical case the retrievable Straub Capturex® vascular protection system was chosen because of already existing, US and CT scan verified, thrombus observed above the level of the renal veins and diaphragm. An open thrombectomy with left nephrectomy was performed simultaneously.

**References:**