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## Case Report

# *Interventional Angioplasty, a Growing Therapeutic Approach to the Superior Vena Cava Obstruction in the Presence of Hemodialysis Catheters: A Report of Two Cases*

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## ABSTRACT

***Background:*** The long-term resistance of indwelling hemodialysis catheters leads to the development of the superior vena cava (SVC) syndrome due to the obstruction of the dialysis catheters. The management of these cases needs technically challenging interventional procedures using balloon inflation or stent implantation at the SVC/right atrium junction. Hereby, we report 2 cases of the SVC syndrome in the setting of hemodialysis catheters which were successfully treated via interventional angioplasty.

***Case Presentation:*** The first case was a 57-year-old man who was referred to us with facial congestion, gradual loss of consciousness, and fever. The patient underwent emergent hemodialysis. The source of the fever was found to be an infected permacath in the left internal jugular vein. He underwent hemodialysis through a right-sided access catheter. Upon the termination of the fever, the jugular access was exited and an arteriovenous fistula (AVF) was implanted in the right arm. After a while, the patient experienced swelling in the right arm. Finally, he underwent angioplasty on the occluded AVF. On follow-up, the arm swelling had faded gradually. The second case was a 60-year-old man who was referred to us with a diagnosis of under-dialysis. On admission, the patient's permacath was removed and an AVF was implanted in his right arm to replace a dysfunctional AVF previously inserted in his left arm. After the maturation of the right arm's AVF, the patient underwent regular hemodialysis sessions without complications. After 1 year, under-dialysis occurred again. On venous angiography, a cut-down venous drainage from the origin of the brachiocephalic vein up to its entry into the right atrium was seen.

***Conclusions:*** Interventional angioplasty is a therapeutic approach to the SVC obstruction in the presence of hemodialysis catheters. ***(Iranian Heart Journal 2019; 20(1):64-66)***

**KEYWORDS:** Superior vena cava obstruction, Interventional angioplasty, Hemodialysis, Catheter

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The long-term resistance of indwelling hemodialysis catheters results in the development of the superior vena cava (SVC) syndrome. [1] An early endovascular intervention is required for the treatment of the SVC syndrome, but the procedure needs great amounts of experience. [2] Herein, we present 2 cases of successful angioplasty on the SVC syndrome in the setting of hemodialysis indwelling catheters.

## Case Presentation

### Case I

A 57-year-old man was referred to us with end-stage renal disease due to diabetic nephropathy. Over the preceding month, the patient had experienced sudden facial congestion and the gradual loss of consciousness as manifestations of the SVC syndrome. He was febrile (40°C auxiliary) because of an infected permacath implanted in the left internal jugular vein. The permacath was exited, and he underwent hemodialysis through a right-side catheter. Upon the termination of the fever, the jugular access was exited and an arteriovenous fistula (AVF) was implanted in the right arm. To allow the AVF maturation, we implanted a jugular access at the contra-lateral side. After a while, the patient experienced swelling in his right arm. This swelling was worsened with time. Due to a suspected AVF stenosis, he underwent diagnostic angiography. At venous angiography, the distal part of the AVF was shown to be totally cut-off. The subclavian and innominate veins were completely patent. He underwent angioplasty on the occluded AVF with a balloon (8×40 mm). In the final injection, the occluded AVF was completely patent (Cineangiography 1). On follow-up, the patient's arm swelling had faded gradually.

### Case II

A 60-year-old man was referred to us with a diagnosis of under-dialysis through a permanent permacath because of diabetic nephropathy. Due to the occurrence of under-dialysis manifestations, the permacath was removed. An AVF was implanted in the right harm owing to a dysfunctional AVF previously implanted in the left arm. After 1 year, under-dialysis occurred again. Gradually, the bruit of the right arm's AVF decreased as a manifestation of its decreased flow. With time, congestion appeared in the patient's right hand, right arm, and face. He was scheduled for venous angiography with a suspected diagnosis of the SVC syndrome. On venous angiography, a cut-down venous drainage from the origin of brachiocephalic vein up to its entry into the right atrium was seen. A trauma guide wire (0.035) was passed from this total occlusion into the right atrium. A balloon (8×40 mm) was passed over the guide wire. After balloon pre-dilation in the venous course, from the right atrium to the origin of the brachiocephalic vein, a self-expandable stent (16×120 mm) was implanted. After another balloon pre-dilation, a stent (16×120 mm) was implanted from the right atrium into the origin of the brachiocephalic vein (Cineangiography 2). After post-dilation with a balloon (14×140 mm), the drainage of the brachiocephalic and jugular veins into the right atrium was established. Following interventional angioplasty, the patient underwent regular hemodialysis without any complications. His swelling and his creatinine level were decreased with time. On follow-up, he was asymptomatic (Fig. 1).

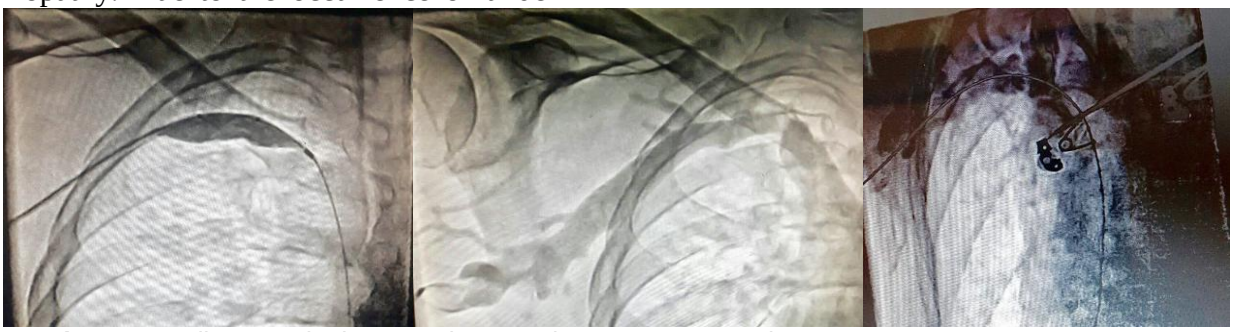

**Figure 1.** Balloon angioplasty on the superior vena cava syndrome
Left: superior vena cava syndrome with multiple stenoses of this vein; Middle: balloon inflation; Right: final injection showing a totally open superior vena cava

## DISCUSSION

Interventional angioplasty is the mainstay therapeutic strategy for the treatment of the SVC syndrome. [5-7] This treatment needs specialists in endovascular intervention. [8-10] We herein presented 2 cases of a successful treatment of the symptomatic occlusion of the SVC in 2 patients with end-stage renal disease. Our patients showed long-term success rates after the interventional re-cannulation of their occluded central veins.

## CONCLUSIONS

Interventional angioplasty is a therapeutic approach to the SVC obstruction in the presence of hemodialysis catheters.

**Conflict of Interest**

The authors declare no conflict of interest.

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