

## Endovascular Treatment of Chronic Superior Vena Cava Occlusion

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### DESCRIPTION

The patient presented in the paper “Iatrogenic occlusion of bilateral jugular veins, subclavian vein, and superior vena cava after repeated jugular cannulation associated with Arnold-Chiari malformation: Successful endovascular treatment” suffered from chronic occlusion of the superior vena cava, left and right subclavian veins and left jugular vein resulting from repeat central venous cannulations for congenital hydrocele. Iatrogenic occlusion may develop after electrophysiology procedures including pacemaker implantation but also in patients with central venous catheters for chronic dialysis as well as those with thoracic tumors or repeat central venous cannulations for other diseases.

The mainstay of the correct diagnosis is thorough history-taking and physical examination as they allow pinpointing typical complaints (persistent headaches, face or upper limb edema) as well as noting abnormal dilation of superficial veins in the neck and shoulder girdle area. Such clinical manifestations, along with medical history, should prompt further diagnosis and consideration of endovascular treatment.

CT angiography or venographies are the key examinations facilitating accurate quantification of the extent of superior vena cava stenosis or occlusion. They also allow the identification of patients eligible for endovascular treatment, which then undergo endovascular interventions aimed to restore venous drainage from the head and upper limbs and dilate the restored lumen using balloon angioplasty.

More and more frequently, a stent is also inserted. Initially, artery stents had been used. Then, however, stents specially dedicated for the venous system were constructed and have now been used for a couple of years resulting in improvement of the long-term outcomes. Access vessels for these procedures are the femoral vein

or, in some patients, also jugular or radial veins. Due to difficulties in interpreting our patient’s CT angiograms (slow contrast outflow from the head and upper body), extent of the occlusion could not be determined.

Venography was therefore performed with contrast injected into the right internal jugular vein and femoral vein. When the procedure ends in success and the superior vena cava can be recanalized, the patient’s symptoms tend to subside completely or become markedly alleviated. In some patients, of course, a palliative endovascular intervention does not change prognosis associated with the underlying disease. However, the quality of life is significantly increased. The condition of our patient improved so much that he was able to successfully return to work.

Maintaining long-term patency of vein and stent lumen is undoubtedly quite a challenge and is associated with disease severity, occlusion extent and stent length. Adequate pharmacotherapy and regular follow-ups are also of importance. Our patient received the following scheme of pharmacotherapy: 80 mg subcutaneous enoxaparin and 150 mg acetylsalicylic acid daily for 30 days of the procedure. Afterwards (and for 4 years now): 20 mg rivaroxaban plus 150 mg acetylsalicylic acid per day.

CT angiography is performed once a year and duplex Doppler ultrasound every 6 months. It is essential to inform patients that they might develop acute stent thrombosis and symptom recurrence. If this happens, they should seek emergency medical care at their treatment center, which might consider a repeat endovascular intervention or targeted thrombolysis. Summing up, it should be emphasized that continuous evolution of endovascular techniques allows the application of endovascular management in more and more patients with chronic occlusion /stenosis of the superior vena cava. It should be noted though that this requires popularizing these procedures among the medical profession.

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