

Endovascular stenting for treatment of superior vena cava syndrome

Süperiyor vena kava sendromunun endovasküler stent ile tedavisi

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With the advances in interventional cardiology, percutaneous treatment by stenting has become a reasonable strategy in superior vena cava syndrome (SVCS), whether the underlying disease is malign or benign. We present a 48-year-old woman with typical signs and symptoms of SVCS, who was treated with endovascular stenting by the percutaneous approach. We obtained both procedural success with complete restoration of blood flow and immediate relief of symptoms. During a follow-up period of six months, the patient was free of symptoms and computed tomography demonstrated complete stent patency.

Key words: Stents; superior vena cava syndrome/etiology/therapy; vascular surgical procedures.

Girişimsel kardiyolojideki gelişmelerle birlikte, süperiyor vena kava sendromunun (SVKS) tedavisinde, altta yatan etyoloji malign veya benign da olsa, perkütan stent tedavisi etkin bir tedavi yöntemi olmaya başlamıştır. Kırk sekiz yaşındaki kadın hasta SVKS'yi gösterir tipik semptom ve bulgular ile kliniğimize başvurdu. Hastaya perkütan yolla endovasküler stent uygulandı. İşlem sonrasında kan akımının tamamen sağlanması ile birlikte semptomların da hızla kaybolduğu gözlemlendi. Altı aylık takibi sırasında hastanın herhangi bir semptomu yoktu ve bilgisayarlı tomografide stentin tamamen açık olduğu görüldü.

Anahtar sözcükler: Stent; süperiyor vena kava sendromu/etyoloji/tedavi; vasküler cerrahi işlem.

Superior vena cava syndrome (SVCS) is a well-known manifestation of benign and malignant tumors of the upper mediastinum that causes obstruction of blood flow through the superior vena cava (SVC).^[1] Percutaneous treatment via stenting is an accepted strategy for patients with SVCS as a palliative approach if it is impossible to treat the underlying disease, most commonly a metastatic tumor, and when the patient is highly symptomatic.^[2,3]

We present a case of SVCS treated with endovascular stenting resulting in complete restoration of blood flow and relief of symptoms.

CASE REPORT

A 48-year-old woman without any history of coronary artery disease, hypertension, diabetes, or valvular heart disease presented to our hospital with a six-month history of increasing swelling in the face and neck, shortness of breath, severe headache, and a feeling of 'tension in the head' especially in the mornings. She did not

have any anginal symptom, dyspnea, or palpitations. She had normal blood pressure from both arms and her electrocardiogram was not diagnostic with a heart rate of 88 beats per minute and incomplete right bundle branch block in sinus rhythm. She had venous distention and edema in the head, neck and upper extremities on physical examination. There were no pathological heart sounds and murmurs, with bilateral clear lung fields on auscultation. Her chest X-ray showed significant widening of the mediastinum with a normal cardiothoracic index and normal lung parenchyma.

She was clinically diagnosed as having SVCS and contrast-enhanced computed tomography was performed to confirm the diagnosis. An upper mediastinal lobulated mass was detected, measuring 7.5 x 6.4 x 5.6 cm and compressing the nearby structures, especially the SVC. To determine the nature of the mass, a mediastinal biopsy was obtained, which yielded the diagnosis of a benign process, mediastinal fibrosis. The patient was informed about treatment

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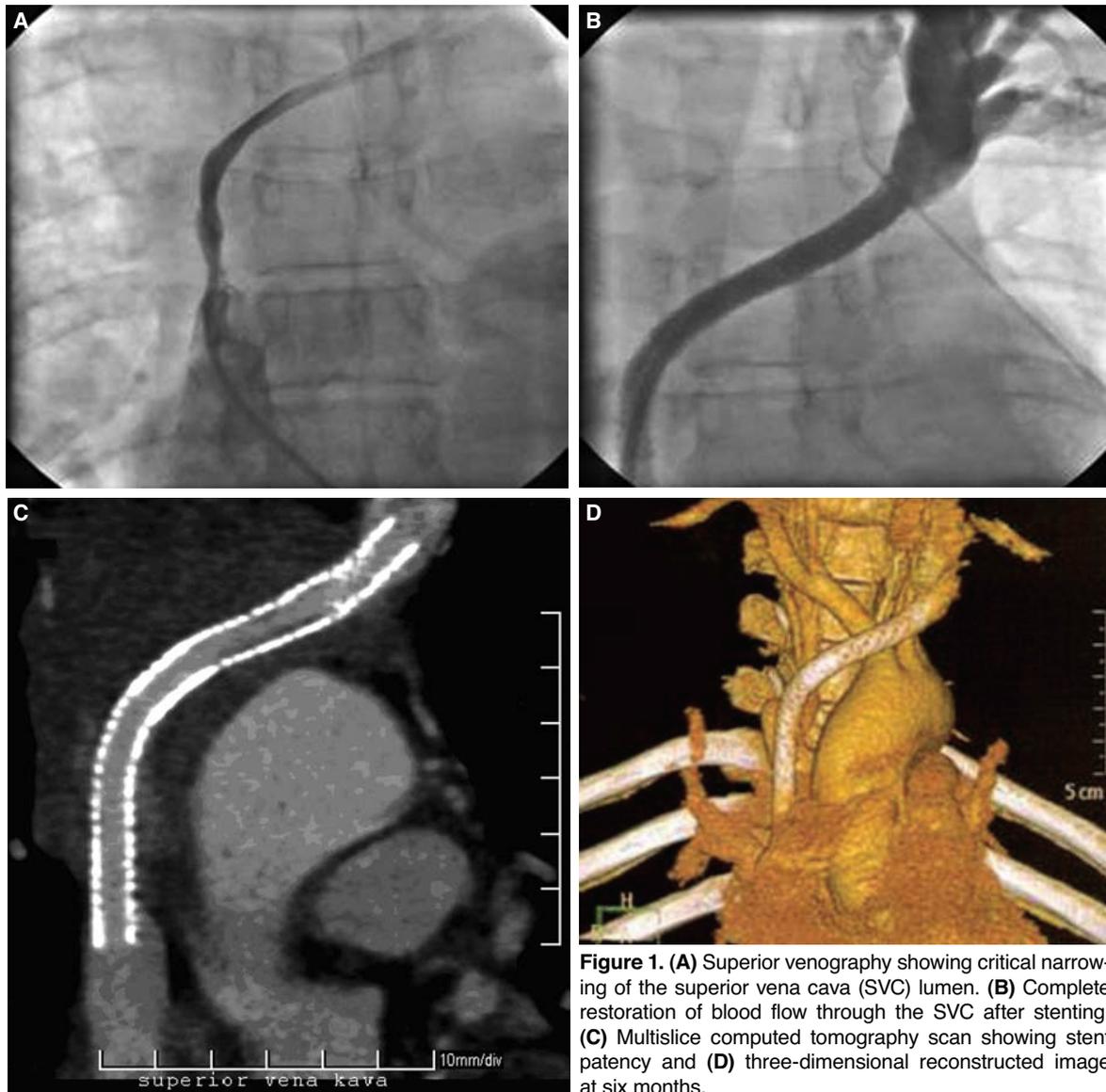


Figure 1. (A) Superior venography showing critical narrowing of the superior vena cava (SVC) lumen. (B) Complete restoration of blood flow through the SVC after stenting. (C) Multislice computed tomography scan showing stent patency and (D) three-dimensional reconstructed image at six months.

options including surgery and endovascular treatment. She did not want to have an open chest surgery. She was taken to the catheterization laboratory for percutaneous stenting of the SVC to restore SVC patency and alleviate the patient's symptoms.

Superior vena cavography was performed via a right retrograde venous approach from the common femoral vein to evaluate the degree of SVC obstruction and it showed significant narrowing of the lumen with almost complete restriction of blood flow to the right atrium (Fig. 1a). The diffuse stenosis in the SVC was transversed with a 0.35-inch hydrophilic guidewire (Bioart, Japan) and an 8-F guiding catheter (Boston Scientific, USA) was used. The obstruction was dilated using a 6.0x80-mm balloon (Pheron, Biotronik,

Germany) and two overlapping stents (Dynamic Balloon-Expandable Stent, Biotronik) of equal size (6.0x56 mm) were implanted in the SVC at 16 atm pressure (Fig. 1b). The patient showed a dramatic and prompt relief of symptoms and was discharged home the next day of the procedure on warfarin treatment with a targeted INR level between 2 and 3.

During six months of the stenting procedure, the patient was completely asymptomatic without swelling and edema of the head and neck. She showed no signs of SVCS on physical examination and she was on oral anti-coagulation treatment with an optimal therapeutic INR level. Multislice contrast-enhanced computed tomography performed to evaluate stent patency showed a normal SVC lumen (Fig. 1c, d).

DISCUSSION

Superior vena cava syndrome generally occurs as a result of either compression by an adjacent tumor in 85% of cases or compression by mediastinal lymph nodes.^[1] The clinical presentation of SVCS depends primarily on the acuteness of SVC obstruction. The most common symptoms of presentation include facial and neck swelling, bilateral upper extremity swelling, dyspnea, headache, and cough.^[1,3] Superior vena cava syndrome is often clinically diagnosed, with the patient presenting with signs and symptoms related to venous congestion. Chest radiography, venous Doppler ultrasonography, contrast-enhanced computed tomography, and magnetic resonance imaging are contributory modalities when the diagnosis is unclear or detailed information is required to determine the treatment option especially before surgery.^[4,5]

There are two main targets for the treatment of SVCS. Firstly, the mediastinal mass adjacent to the SVC, most commonly a metastatic tumor or enlarged lymphadenopathy, can be treated depending on its nature whether it is benign or malignant. Medical management (especially for hormone-responsive tumors), chemotherapy, external radiotherapy, and surgical removal are the treatment modalities to manage the underlying disease process with complete cure.^[2,6,7] If the malignant tumor is inoperable or the mass has a benign nature, endovascular treatment with stenting becomes the primary choice of treatment, which aims the symptomatic relief of patients by restoration of blood flow through the SVC.^[7,8]

The use of angioplasty and stenting in the treatment of SVCS has developed over the past 15 years. With high success rates of stenting and nearly complete and immediate relief of symptoms, endovascular treatment has become a safe, consistent, and cost-effective treatment for patients with SVCS.^[2,3]

Most of the evidence for SVC stenting depends on nonrandomized trials in individual centers and case series with small numbers of patients, so neither level 1 nor level 2 evidence exists. The results of only a small number of case series (with limited follow-up) have been reported on the use of SVC stenting in benign disease.^[7-9] In two series, with a total of 18 patients, technical success was 100%, with complete resolution of SVC symptoms. In a systematic review of treatment for malignant SVC obstruction, compared to radiation therapy or chemotherapy, stent insertion provided relief of symptoms more rapidly and in a much higher proportion (95%) of patients.^[3]

The most common complication of this therapy is stent thrombosis, which can be successfully treated with thrombolysis or stent replacement.^[10] The risk for thrombosis is significantly reduced when long-term anticoagulation with warfarin is used following endovascular stenting.^[8-10] Stent migration is another complication of the procedure, but it mainly occurs as a result of inappropriate placement or fixing site within the SVC.^[9,10] Perforation or rupture of the vein, requiring emergency surgery, is a potential but extremely rare risk.^[8,9]

In conclusion, results with endovascular stents in the treatment of SVCS of both benign and malignant causes are excellent. Percutaneous endovascular stent insertion is an effective treatment for palliation of SVCS as it provides immediate and sustained symptomatic relief.

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