

Endovascular stenting for treatment of superior vena cava syndrome

Subramanyam K¹, Janardhan Kamath², Dilip Johny³ & Paul T. Joyes⁴

¹Professor & HOD, ³Lecturer, Department of Cardiology, ²Associate Professor, Department of Nephrology,

⁴Post Graduate, Department of Medicine, K. S. Hegde Medical College,
Nitte University, Mangalore, Karnataka, India.

Correspondence

Paul T. Joyes

Post Graduate, Department of Medicine, K. S. Hegde Medical College, Nitte University, Mangalore 575018, Karnataka, India.

Mobile : +91 98808 54869 E-mail : rush2paul.pj@gmail.com

Abstract

Superior vena cava syndrome (SVCS) is a well-known manifestation of benign and malignant tumors of the upper mediastinum. Superior vena cava (SVC) obstruction and thrombosis caused by indwelling venous catheters is a growing problem in patients on regular haemodialysis. We present a 62-year-old woman with typical signs and symptoms of SVCS, secondary to thrombosis surrounding the indwelling central catheter 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.

Keywords : SVCS, Endovascular stenting, thrombosis, central line

Introduction

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). Superior vena cava (SVC) obstruction and thrombosis caused by indwelling venous catheters is a growing problem in patients on regular haemodialysis and is associated with an appreciable morbidity and mortality. 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 malignant or benign. We present a 62-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.

Case report

A 62 year old lady with dialysis dependent renal failure was admitted in our hospital on 13/2/2015

with history of progressive swelling of face, neck and upper chest since 1 month duration (Figure1). She was dialysed through a perm catheter on the right jugular which was inserted about 2 years back (Figure3). On evaluation she was diagnosed to have obstruction of SVC due to the thrombus surrounding the indwelling central line. A venogram done in our hospital revealed poor flow through the SVC. Echocardiogram done was also suggestive of decreased SVC flow. The perm catheter had very poor flow and hence a Right femoral trialyser was inserted for dialysis. Patient was posted for superior vena caval stenting on 19/2/2015.

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 (Figure5). 0.035" x 260cms Cordis Emerald guidewire was placed through the Perm catheter across SVC, RA and placed in IVC. Perm catheter was removed. Predilatation done with Admiral Xtreme 5 x 80mm Percutaneous transluminal angioplasty (PTA) balloon at 8 atmospheres. 16 x 60mm Self expanding (Boston Scientific) Wall stent was deployed. Post dilated with 8 x 37mm EV3

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balloon at 8 atmospheres. Immediate end result was good (Figure6). On the next day patient was completely relieved of her symptoms and her swelling of face and neck had completely resolved (Figure2). A screening echo was done which showed adequate flow through the SVC. Patient was started on anticoagulation with the target to keep the INR between 2–3.



Figure 1 : Patient before endovascular stenting of Superior venacava



Figure 2: Patient after 12hrs of endovascular stenting



Figure 3 : The red arrow shows perm catheter in situ



Figure 4 : Endovascular stent in Superior venacava extending into the Right atrium



Figure 5 : Shows complete occlusion of superior venacava



Figure 6 : Shows S/P endovascular stenting of superior venacava with patent stent extending to Right atrium

Discussion

Superior vena cava syndrome generally occurs as a result of either compression by an adjacent tumour in 85% of cases or compression by mediastinal lymph nodes. The clinical presentation of SVCS depends primarily on the acuteness of SVC obstruction. [1] The most common symptoms of presentation include facial and neck swelling, bilateral upper extremity swelling, dyspnea, headache, and cough. Superior vena cava syndrome is often clinically diagnosed, with the patient presenting with signs and symptoms related to venous congestion. [2]

Superior vena cava (SVC) obstruction and thrombosis caused by indwelling venous catheters is a growing problem, and is associated with an appreciable morbidity and mortality. [3]

Factors like under-provision of vascular access surgery, late referral and co-morbidities, large number of patients are subjected to use tunnelled venous catheters in the medium to long term haemodialysis. [4] One consequence of this will be the increasing incidence of central venous stenosis, thrombosis and exhaustion.

In this patient SVC obstruction was caused by thrombosis of SVC produced by venous catheter inserted for haemodialysis.

The pathophysiology is thought to be secondary to early intimal injury associated with focal endothelial denudation occurring with short-term central venous catheters and related to the position of the tip of the catheter, the site of insertion, the material, and predisposition to thrombosis.[5]With long-term catheter use, there is vein wall thickening, increased smooth muscle cells and focal catheter attachments to the vein wall with thrombus and collagen.[6] Management needs to be individualized. In the first few days of SVC thrombosis, removal of catheter, chemical or mechanical thrombolysis of the clot and/or venoplasty and stenting has been reported to resolve the symptoms. [7]

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. [8]

The most common complication of this therapy is stent thrombosis, stent migration perforation and rupture of veins which can be successfully treated with thrombolysis or stent replacement and anti-coagulation with warfarin. The chance of stent migration and rupture of veins is very rare. [9]

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Conclusion

Indwelling Central venous catheter is known to cause SVCS secondary to stent thrombosis.

Endovascular stenting for superior vena cava syndrome has shown rapid relief of symptoms after the procedure. This procedure is relatively safe and complication like stent migration and rupture of veins are very rare. Patients should be started on anti-coagulation with warfarin to prevent stent thrombosis.

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