

## Migrated Brachiocephalic Venous Stent into the Right Atrium – Can it be Left Alone? A Case Report and Review of the Literature

Dear Editor,

A potentially fatal complication of stenting of the venous system is stent migration into the right atrium and several methods of redeployment or retrieval of the migrated stent have been described. However, we present a scenario for the conservative management of a migrated brachiocephalic venous stent into the right atrium, with no adverse stent related outcome.

### Case Report

A 60-year-old man was admitted to hospital with a myocardial infarction and was incidentally found to have a right posterior thoracic mass on chest-radiograph. Computed tomography (CT) confirmed a large posterior thoracic mass with pleural thickening. No mediastinal lymphadenopathy or pulmonary metastasis was seen. He had a coronary artery bypass grafting and returned 2 months later for biopsy of the mass where histological diagnosis of a malignant solitary fibrous tumour of the pleura was made. A week following biopsy, he presented with stridor. Repeat CT showed an increase in tumour size with invasion of the superior mediastinum and significant compression of the distal trachea and right main bronchus. A rigid bronchoscopy and stenting (Ultraflex®) of the distal trachea and bronchus intermedius was performed. He was not a surgical candidate owing to his multiple comorbidities and recent myocardial infarction and hence commenced on palliative radiotherapy with good symptomatic relief.

Five months following completion of radiotherapy, he presented with severe chest pain, breathlessness and left arm swelling. He had dilated neck veins and telangiectasia of the chest wall with decreased air entry in the right hemithorax. A repeat CT showed the tumour invading the superior mediastinum and compressing the trachea and right upper lobe bronchus, despite the tracheal stent in situ. Catheter venography demonstrated stenosis of both brachiocephalic veins. A 14mm x 60mm Nitinol self expanding stent (Smart stent Cordis®) was deployed in the right brachiocephalic vein and a 12mm x 80mm stent (Smart stent) was deployed in the left brachiocephalic vein. Both stents were confirmed to be in a satisfactory position and patent at the end of the procedure. He received a further course of radiotherapy with good symptomatic relief.

He defaulted clinical follow-up and presented one year later with haemoptysis, dyspnoea, spiking temperature and reduced air entry in the right hemithorax. CT showed the tumour almost completely filling the right hemithorax with collapse of the right lung, small right pleural effusion, small pericardial effusion and oesophageal and tracheal compression and deviation to the left. The left brachiocephalic venous stent was in a satisfactory position. However, the right brachiocephalic venous stent had dislodged and migrated into the right atrium where it was seen closely related to the roof, posterior wall and floor of the right atrium (Fig. 1). The stent was presumably dislodged by the growing tumour compressing on the right brachiocephalic vein. His electrocardiogram tracing

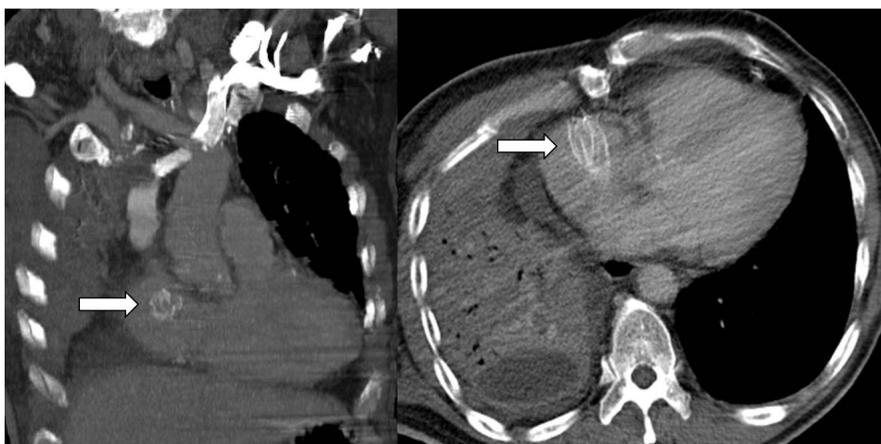


Fig. 1. Contrast enhanced coronal and axial CT images one-year after stent deployment showing tumour filling the right hemithorax, compressing the right brachiocephalic vein and a dislodged venous stent in the right atrium (white arrows). A patent left brachiocephalic venous stent is seen. A small right pleural effusion and pericardial effusion with consolidation of the right lower lobe is also demonstrated.

was normal. Percutaneous retrieval of the stent was not attempted as the stent was closely related to the atrial wall and possibly fibrosed to the myocardium owing to the long interval between stent placement and detection of the stent migration.

He was treated with intravenous antibiotics with resolution of his pyrexia and improvement in his symptoms. He remained on aspirin following his myocardial infarction and was discharged to a hospice. He was asymptomatic during outpatient clinic follow-up 2 months later and remained in a hospice for 15 months before he died of a severe pneumonia.

### Discussion

While studies have reported a greater than 90% success rate for the percutaneous management of migrated intravascular stents,<sup>1</sup> there have been reports of unsuccessful percutaneous stent retrievals requiring conversion to open surgery. Walles et al<sup>2</sup> described migration of a right subclavian vein Wallstent into the right ventricle, where it entangled in the tricuspid valve causing severe tricuspid insufficiency. Percutaneous attempts at stent retrieval were unsuccessful and the stent was removed by an anteriolateral right thoracotomy and atriotomy.

Complications of the retrieval process have also been documented. Slonim et al<sup>1</sup> reported migration of a Palmaz stent from an axillary vein into the right ventricle. The patient had significant tricuspid insufficiency after an attempted percutaneous stent retrieval which may have been caused by stent manipulation. Surgical removal of the stent was performed where the stent was found entangled in the tricuspid valve. The potential for significant vascular injuries such as intimal damage, dissection or perforation as inflated balloons and stents are manipulated along diseased vessels or the possibility for causing conduction abnormalities, valvular damage or cardiac perforation during retrieval of stents from or through the heart were raised. Manipulation of stents may worsen compromise of vessel lumens that existed before the retrieval attempt. During attempted retrieval, stents could dislodge to more hazardous positions making retrieval more difficult. Puncture site complications were also considered due to the need for large sheaths in the retrieval process, increasing the risk of haematoma, pseudoaneurysm or arterio-venous fistula formation. Prahlow et al<sup>3</sup> reported a death due to right atrial and aortic perforation resulting in haemopericardium and cardiac tamponade during the retrieval of a Wallstent that migrated during creation of a transjugular-intrahepatic-portosystemic-shunt.

A potentially fatal complication of intravascular stenting is stent migration into the pulmonary artery. These stents

have been left in situ with no adverse stent related outcome.<sup>4</sup>

A PUBMED search using the criteria 'migrated stent in right atrium' and 'migrated endovascular stent' limited to articles in the English language revealed one article which described the conservative management of a Nitinol Symphony stent, used for benign SVC occlusion, which had dislodged in the right ventricular outflow tract. However the long term outcome was not documented.<sup>5</sup> The PUBMED search did not reveal any articles documenting the conservative management of a dislodged venous stent into the right atrium for management of a malignant vascular occlusion.

Our case report shows that in a patient with advanced malignancy and a short life expectancy, migration of a stent from a central vein into the right atrium may be treated conservatively with no adverse stent related outcome.

### REFERENCES

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