



Peripherally Inserted Central Catheter-Induced Right Atrium Thrombosis and Superior Vena Cava Dissection

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Abstract

A 42-year-old woman with past medical history of intravenous drug abuse was admitted to hospital with fever and heart murmur. A peripherally inserted central catheter (PICC) was inserted because the patient had poor venous access. Transesophageal echocardiography was done to rule out infective endocarditis. The test showed thrombus attached to the PICC line. Thrombus arising from a catheter is known complication of PICCs. Classifications of right heart thromboembolism (RHTE) are based on morphology. Type A thrombi are highly mobile and may prolapse through the tricuspid valve. Conversely, type B thrombi are attached to the right atrial or ventricular wall and may originate in association with foreign bodies or in structurally abnormal chambers. RHTEs are associated with pulmonary embolism in approximately 4%-6% of cases and increase the 3-month mortality rate from 16% to 29%. On echocardiography, partial dissection of the superior vena cava (SVC) was also noted. This is a very rare complication of PICC. To the best of our knowledge this is the first reported case of PICC-induced thrombosis with partial dissection of SVC. The PICC line was removed and echocardiography postremoval did not show any thrombus. The patient remained asymptomatic without any signs of hemodynamically significant pulmonary embolism. SVC dissection was also managed conservatively. Use of central venous catheters in clinical practice is increasing but it is not a benign procedure. It may be associated with serious complications.

Keywords: PICC induced thrombosis, superior vena cava dissection, complications of PICC line

Introduction

During the past few years, use of peripherally inserted central catheters (PICCs) has increased dramatically. Placement is usually a benign procedure, but sometimes may be associated with serious complications. We present a 42-year-old woman with past medical history of intravenous

drug abuse who was admitted to our hospital with fever and heart murmur. A PICC was inserted because the patient had poor venous access. No difficulties were faced while inserting or manipulating the guide wire. Transesophageal echocardiography after 48 hours was done to rule out infective endocarditis and showed a thrombus attached to the PICC line (Figure 1A). Thrombus arising from catheters is a known complication of PICCs. Classifications of right heart thromboembolism (RHTE) are based on morphology. Type A thrombi are highly mobile and may prolapse through the tricuspid valve. Conversely, type B thrombi are attached to the right atrial or ventricular wall and may originate in association with foreign bodies (as in our patient) or in structurally abnormal chambers.¹ RHTEs are associated with pulmonary embolism in

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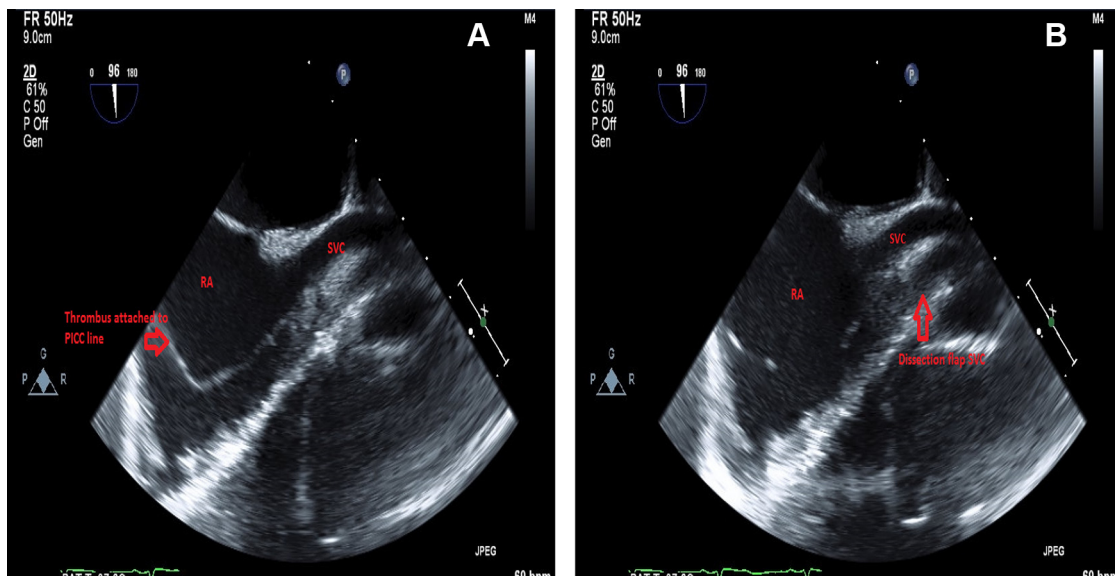


Figure 1. Bicaval view of transesophageal echocardiograph. A, Thrombus attached to peripherally inserted central catheter (PICC) in the right atrium. B, Thrombus attached to PICC line and partial dissection (arrow) of the superior vena cava.

approximately 4%-6% of cases and increase the 3-month mortality rate from 16% to 29%.^{2,3} On echocardiography, partial dissection of the superior vena cava was also noted (Figure 1B). This is a very rare complication of PICC. To best of our knowledge this is the first reported case of PICC-induced thrombosis with partial dissection of the superior vena cava. The patient was started on heparin drip and the PICC was removed the next day. No material was seen attached to the catheter and no thrombus was seen on repeat imaging—most probably the thrombus dislodged while the catheter was being pulled out. There were no signs of pulmonary embolism clinically and the patient recovered during her stay in the hospital. The patient was given only antibiotic therapy before the thrombus was seen and after that no medications were given through the port. The patient remained in the hospital for a week for her other comorbid conditions and was discharged with no medications because the catheter was removed. There were no complications due to this thrombus. Use of central venous catheters in clinical practice is increasing but it is not a benign procedure. It may be associated with serious complications.

Careful patient selection is only way by which RHTE secondary to foreign body can be avoided. Only patients with clear indications should get a PICC.

Disclosures

The authors have no conflicts of interest to disclose.

References

1. Burns KE, McLaren A. Catheter-related right atrial thrombus and pulmonary embolism: a case report and systematic review of the literature. *Can Respir J*. 2009;16(5):163-165.
2. Gilon D, Schechter D, Rein AJ, Gimmon Z, Or R, Rozenman Y, et al. Right atrial thrombi are related to indwelling central venous catheter position: insights into time course and possible mechanism of formation. *Am Heart J*. 1998;135:457-462.
3. Torbicki A, Galie N, Covezzoli A, Rossi E, De Rosa M, Goldhaber SZ, et al. Results from the International Cooperative Pulmonary Embolism Registry. *J Am Coll Cardiol*. 2003;41:2245-2251.