

Case of the Month - Case 3/2000

M Joseph, J Nates

Citation

M Joseph, J Nates. *Case of the Month - Case 3/2000*. The Internet Journal of Radiology. 1999 Volume 1 Number 1.

Abstract

CASE STUDY

This is a critically ill 24 year-old female patient, requiring a pulmonary artery (PA) catheter for hemodynamic management. Below are the 3 consecutive chest X rays, the first after a routine insertion of the PA catheter.

Figure 1



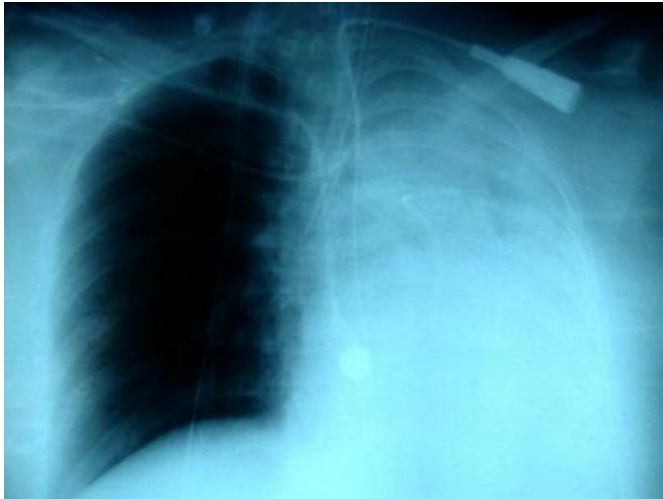
X-Ray 1

Figure 2



X-Ray 2

Figure 3



X-Ray 3

1. What is your diagnosis?
2. What is the incidence of this pathology?
3. What are the risk factors?
4. What is the known mortality rate?
5. What would be your treatment options?

Question 1: What is your diagnosis?

A: The patient has developed a hemothorax due to rupture of the pulmonary artery, caused by the PA catheter.

Other potential complications due to use of a PA catheter include pneumothorax, arrhythmias, pulmonary infarction, sepsis and endocarditis, balloon rupture and subclavian artery injury.

Question 2: What is the incidence of this pathology?

A: Published reports range of pulmonary artery rupture as a complication of the PA catheter range from 0.001% to 0.47%.¹ Postulated mechanisms include distal tip migration penetrating the wall during balloon deflation,² overdilatation of the balloon with fluid,³ and traction on an inflated, wedged balloon.⁴

Question 3: What are the risk factors

A: Proposed risk factors include age over 60 years, pulmonary hypertension, improper balloon inflation, improper catheter positioning, cardiopulmonary bypass and anticoagulation.¹

Question 4: What is the known mortality rate?

A: Thoracotomy appears to improve survival (50%) in patients who develop a hemothorax, whereas conservative treatment in these patients is not successful.¹ Patients who do not develop a hemothorax have a 25% mortality rate.

Question 5: What would be your treatment options?

A: Nonsurgical options include flexible bronchoscopy and Fogarty catheter tamponade,⁵ applying high PEEP⁶ and conservative treatment, all of which are recommended in patients without a hemothorax. Double lumen intubation to protect the noninvolved lung has also been recommended.⁷

Surgical options require a thoracotomy with arterial repair,⁵ pneumonectomy⁷ or lobectomy.⁸

References

1. Kearney TJ, Shabot MM: Pulmonary artery rupture associated with the Swan-Ganz catheter. *Chest* 1995; 108: 1349-52.
2. Johnston WE, Royster RL, Vinten-Johansen J, et al: Influence of balloon inflation and deflation on location of pulmonary artery catheter tip. *Anesthesiology* 1987; 67: 110-15.
3. Hardy JF, Morissette M, Taillefer J, et al: Pathophysiology of rupture of the pulmonary artery by pulmonary artery balloon-tipped catheters. *Anesth Analg* 1983; 62: 925-30.
4. Farber DL, Rose DM, Bassell GM et al: Hemoptysis and pneumothorax after removal of a persistently wedged pulmonary artery catheter. *Crit Care Med* 1977; 14: 748-49.
5. Kelly TF, Morris GC, Crawford ES, et al: Perforation of the pulmonary artery with Swan-Ganz catheters: diagnosis and surgical management. *Ann Surg* 1981; 193: 686-91.
6. Scuderi PE, Prough DS, Price JD, et al: Cessation of pulmonary catheter-induced endobronchial hemorrhage associated with the use of PEEP. *Anesth Analg* 1983; 62: 236-38.
7. Barash PG, Nardi D, Hammond G, et al: Catheter induced pulmonary artery penetration: mechanisms, management and modifications. *J Thorac Cardiovasc Surg* 1981; 82: 5-12.
8. McDaniel DD, Stone JG, Faltas AN, et al: Catheter induced pulmonary artery hemorrhage: diagnosis and management in cardiac operations. *J Thorac Cardiovasc Surg* 1981; 82: 1-4.

Author Information

Mathew Joseph, M.Ch.

Assistant Professor, Departments of Neurosurgery, The University of Texas-Houston, Health Science Center Medical School

Joseph L Nates, M.D.

Assistant Professor, Departments of Neurosurgery and Anesthesia-Critical Care Medicine, The University of Texas-Houston, Health Science Center Medical School