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CLINICAL INFORMATION

A unique case of pulmonary artery catheter bleeding from the oximetry connection port



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KEYWORDS

Pulmonary artery catheter;
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Abstract Pulmonary artery catheter is an invasive monitor usually placed in high-risk cardiac surgical patients to optimize the cardiac functions. We present this case of blood oozing from the oximetry connection port of the pulmonary artery catheter that resulted in the inability to monitor continuous cardiac output requiring replacement of the catheter. The cause of this abnormal bleeding was later confirmed to be due to a manufacturing defect.

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PALAVRAS-CHAVE

Cateter de artéria pulmonar;
Sangramento;
Porta oximétrica

Caso único de sangramento pela porta de conexão do cateter de artéria pulmonar ao módulo de oximetria

Resumo O cateter de artéria pulmonar é um monitor invasivo geralmente usado durante cirurgias cardíacas em pacientes de alto risco para otimizar as funções cardíacas. Apresentamos o caso de escoamento de sangue pela porta de conexão do cateter de artéria pulmonar para oximetria que resultou na impossibilidade de monitorar o débito cardíaco contínuo e na substituição do cateter. A causa do sangramento anormal foi posteriormente confirmada como um defeito de fabricação.

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Introduction

Perioperative monitoring with a balloon-tipped, flow-directed, pulmonary artery catheter (PAC) is typically performed in high-risk surgical patients to facilitate optimization of cardiac function. Placement of the PAC is an invasive

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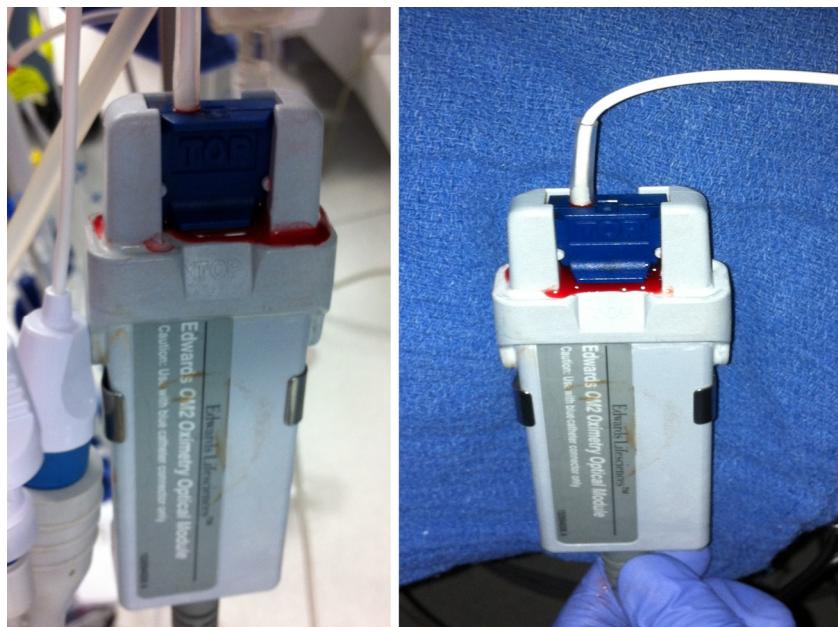


Figure 1 Persistent oozing of blood from the oximetry optical module connection port of the PAC.

procedure associated with complications. The complications unique to the insertion and use of this catheter include carotid artery puncture, hematoma, pneumothorax, ventricular arrhythmias, pulmonary artery embolism/rupture, sepsis, catheter entrapment and knotting.¹ We present this unique case of blood oozing from the oximetry connection port of the PAC resulting in the inability to measure cardiac output or index in a high-risk surgical patient.

Clinical report

A 57-year-old male with aortic coarctation and pseudoaneurysm of the descending thoracic aorta was scheduled for surgical repair. After successful induction, a 9Fr introducer was inserted into the right internal jugular vein by modified Seldinger's technique using ultrasound guidance. A PAC (model number 746HF8) was placed through the introducer. Appropriate waveforms and monitoring of the mixed venous saturation were successful. However, when continuous cardiac output monitoring was attempted, an erroneous message was displayed. While attempting to troubleshoot the error, persistent oozing of blood from the oximetry optical module connection site was noted (Fig. 1). Due to the bleeding from the connection site and inability to record cardiac output, the defective catheter was removed and a new catheter was placed through the existing introducer sheath. The defective catheter was visually inspected and no obvious external defects or tears were detected. The catheter was sent back to the manufacturer (Edward Lifesciences) to evaluate the cause of bleeding. The surgery progressed as planned and the patient was transferred to the ICU for further post-operative management. A couple of weeks later, we received the report from the manufacturer confirming the presence of a small tear in the webbing of the catheter (78 cm from the tip) that was due to a manufacturing defect.

Discussion

The risk of serious complications specifically associated with PAC placement is known to be 0.1–0.5%.¹ Hence, assessment of risk benefit ratio and careful patient selection is necessary prior to its placement. Manufacturing defects with the PAC are rare and are typically discovered prior to the insertion when the catheter is tested for abnormal leaks, tears, or ruptured balloon. Few reports of blood oozing back into the connection port secondary to intraoperative trauma to the PAC have been previously published.^{2,3} The trauma could be from a stitch going through or from scalpel injury to the PAC. In our case, we noticed the blood oozing from the connection port immediately after the placement of the PAC and even before the surgical incision. What makes our particular case unique is that the bedside testing of the PAC could not ascertain the intimal tear.

Defects in the PAC could be frustrating as it is placed mostly in sick patients requiring close monitoring of cardiac function. A defective PAC defeats the purpose of its placement as the cardiac output and index cannot be monitored. Valuable time may be lost in trying to troubleshoot and fix the problem. If this is not recognized, it could lead to significant complications including bleeding and infection. Early recognition of the problem can prevent some of the issues but the risk of complications associated with the replacement of the PAC cannot be trivialized.

In conclusion, the reported case here is an unusual presentation of the manufacturing defect of the pulmonary artery catheter. The defect was not visible to the naked eye or to the routine pre-insertion testing of the PAC but became evident after its placement. Abnormal oozing from the connection port of the PAC indicates a damaged catheter and rather than going through the frustration of troubleshooting the catheter, it is advisable to replace the catheter which may be the most efficient and right thing to do in this situation.

Conflicts of interest

The authors declare no conflicts of interest.

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