Unrecognized arterial cannulation due to the backflow feature of the BD Insyte™ Autoguard™ BC cannula

Andrew Lokoff · Paul Lokoff, MD

Received: 3 September 2014 / Accepted: 13 January 2015 / Published online: 4 March 2015
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To the Editor,

This report outlines the failure to detect an unintentional cannulation of the brachial artery when using the BD Insyte™ Autoguard™ BC cannula (BD – Canada, Mississauga, ON, Canada) for intravenous access. This cannula has recently been introduced to the Canadian market.

The patient's family has consented to the publication of this case report.

The patient was an otherwise healthy ten-year-old boy who presented to the hospital emergency department (ED) with abdominal pain due to appendicitis. The patient's blood pressure was recorded as 95/55 mmHg. In the ED, a BD Insyte Autoguard BC cannula was used to establish intravenous access in the antecubital fossa after a number of failed attempts at other sites. As per hospital policy, the intravenous tubing was then connected to a Carefusion Alaris® infusion pump (CareFusion Canada, Mississauga, ON, Canada). The patient's family reported hearing the infusion pump alarm prior to the boy's transfer to the operating room.

Upon arrival in the operating room, the intravenous tubing was disconnected from the infusion pump, but free flow of fluid could not be established. Furthermore, bright red blood flowed retrogradely up the tubing in a pulsatile fashion. It was apparent that the cannula had been inserted

into an artery, probably the brachial artery. The cannula was removed, a vein was cannulated, and the case then proceeded uneventfully.

The delay in detecting this unintentional cannulation of the brachial artery was most likely related to unique design features of the BD Insyte Autoguard BC cannula. This device has a blood control feature that seals the cannula and prevents backflow of blood once the cannula is inserted into a vein and the metal introducer needle is retracted. This can be seen in the accompanying figure. The intention of the feature is to prevent spillage of blood prior to connection to the intravenous tubing. Once the intravenous tubing is connected, the integrity of the membrane is broken and flow is possible in both directions.

This letter is accompanied by a reply. Please see Can J Anesth 2015; 62: this issue.

A. Lokoff (✉)
Royal College of Surgeons in Ireland, Dublin, Ireland
e-mail: alokoff@gmail.com

P. Lokoff, MD
University of Toronto, Toronto, ON, Canada

Unintentional cannulation of the brachial artery is a known risk of intravenous cannulation in the antecubital fossa because of the proximity of the brachial artery to a number of veins.¹ Risk factors include obesity, dark skin, lack of patient co-operation, and lack of vigilance.¹ It may be possible to detect an arterial cannulation by observing

rapid filling into the flashback chamber, the colour of the blood in the chamber, or free flow of the intravenous fluid by gravity. Ultimately, transducing the line or sampling blood gases could help to determine the location of the cannula in difficult situations.

Though complications specifically from arterial cannulation are uncommon they can include arterial damage, aneurysm formation, thrombosis, and ischemic damage.² Similarly, the sequelae of injecting medications directly into an artery are potentially serious and include limb ischemia, tissue necrosis, gangrene, and limb loss.¹ For example, intra-arterial injection of propofol can cause intense pain,³ and rocuronium has been reported to cause vascular changes.⁴ Catecholamines such as epinephrine and phenylephrine, cause intense vasoconstriction if injected into an artery.⁵

It is advisable to use caution when inserting this newly introduced cannula so as to ensure avoidance of unintentional intra-arterial placement. Warnings about this potential complication are not noted in the product literature.

Conflicts of interest None declared.

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