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Injection port valve malfunction!

The injection port of intravenous (IV) cannula incorporates a valve mechanism that facilitates intermittent drug administration without allowing back flow. Needleless drug injection through the injection port prevents needle stick injuries, thereby making it's use safe and convenient. However, there are reports in literature of valve malfunctioning [1–4]. We would also like to report one such instance that we recently experienced.

An 18-year-old boy was scheduled for exploratory laparotomy. Vascular access was secured using 18G IV cannula (Vanocathe™, iLife Medical Devices Pvt Ltd, INDIA) in the left cephalic vein at the wrist. IV cannula placement was confirmed by observing blood in flashback chamber of cannula, free flowing infusion fluid and absence of swelling. Anaesthesia was induced using standard anesthetic technique. Intraoperatively, top up dose of neuromuscular blocker was given through the injection port via ten ml syringe. A 'pop' was heard during injection. On removing the syringe, there was leakage of blood mixed with fluid through the injection port (Fig. 1). Immediately a luer lock plug was put on the injection port to prevent blood from flowing out. An alternative vascular access was established and the defective cannula was removed.

Subsequently, on examining the defective cannula, we found that the valve (elastomeric sleeve) at injection port was displaced proximally (Fig. 2), this led to continuous leakage of blood and fluid from the injection port. Perhaps, the "pop" heard during drug injection was produced by valve displacement. The matter has been reported to the manufacturer, the response is awaited.

The injection port has an elastomeric sleeve that acts as a one-way valve. When drug is given via syringe, the elastomeric sleeve gets deflected allowing drug to pass through the catheter. It returns to its original position after completion of injection, thereby preventing leakage or entry of air [1]. In case of valve malfunction, leakage of blood and administered drugs and fluids may occur. Leakage of blood, if unnoticed under the cover of drapes may cause significant blood loss and even predisposes personnel to risk of infection [4]. Wetting of overlying drapes increases risk for diathermic burn injuries [5]. There is also possibility of air embolism due to ingress of air through the defective valve [4].

Malfunction of injection port valve has been attributed to manufacturing defect [2,3]. Glass splinter accidently implanted on the surface of valve's elastomeric sleeve preventing valve closure has been reported [4]. Repeated withdrawal and reinsertion of needle into the catheter may damage the elastomeric sleeve and cause valve leak, this practice is not recommended by the manufacturer.

Malfunctioning of injection port valve is not an uncommon occurrence. Personnel need to be aware and stay vigilant due to associated serious consequences. Fear of valve malfunction may lead to underutilization of injection port for drug administration and the potential benefits of its use in terms of safety and convenience are lost. Hence, it is essential to report such incidents both to the hospital authority and the manufacturer for improvization and quality control and build confidence in personnel using it.

Fig. 1. Leakage of blood mixed with infusion fluid from the injection port.

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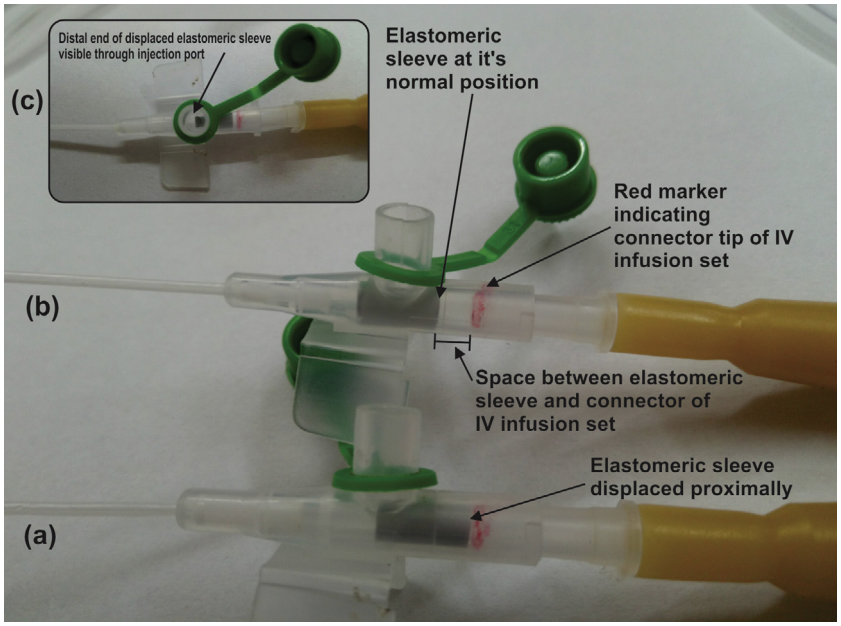

Fig. 2. (a) IV cannula with displaced elastomeric sleeve and reduced space between sleeve's proximal end and connector of IV infusion set (b) IV cannula with correctly positioned elastomeric sleeve (c) displaced elastomeric sleeve covering the injection port partially.

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