Assessment of Arm Port Access Events for 2 Different Port Designs

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Abstract

Background: *Patients in our health region received 1 of 2 different arm ports, totally implanted venous access devices (TIVADs), for the management of their malignancies. One of the ports was a nonpower-injectable design and the other was power-injectable. Infusion nurses most commonly access TIVADs in our health region. It was our goal to evaluate infusion nursing access events for these 2 different TIVADs to determine whether nurses experienced any practical, or functional, differences based on port design.*

Methods: *For this quality assurance project a locally designed, paper-based, questionnaire was developed and administered. Infusion nurses completed the questionnaire after they had accessed an arm TIVAD for intravenous chemotherapy. Sequential access events were tracked for 2 months.*

Results: *There were no statistically significant differences in the responses related to the 2 different TIVAD designs. Identifying the type of implanted TIVAD for each access event in the study group provided some challenges for the infusion nurses. Eighteen nonpower-injectable ports were erroneously identified as power-injectable.*

Conclusions: *The results illustrate that our local cancer center infusion nurses were a very experienced group who have been able to adapt to the 2 different arm TIVAD designs. There was no statistically different access event parameters for the 2 different port designs. Additional end-user education may be warranted to improve port design identification.*

Keywords: *port systems, totally implanted venous access devices, end-user, chemotherapy*

Background

The Mini Titanium Vital-Port (Cook Medical, Bloomington, IN) has been the preferred arm port at our institution since 1995.[1] However, we recently began to insert a power-injectable arm port, the Smart Port CT Mini (Angiodynamics, Latham, NY). Both port designs were inserted in the upper arm of patients requiring treatment of a malignancy. Hence, we introduced a new arm port design into the treatment protocol for patients receiving intravenous therapy. Bench-top images of the 2 different ports are provided for comparison (see Figures 1 and 2). The Mini Titanium Vital-Port is the smallest device marketed by this company and cannot accept the power injection of fluids. The Smart Port CT Mini is power-injectable and is thus larger and more robust in comparison to the Cook port. The technical specifications of these devices are provided in Table 1.

These ports are used for patient care and are accessed in a wide variety of clinical settings; that is, on the ward, in the emergency room, for computed tomography (CT), and in the cancer center infusion therapy department. However, infusion nurses involved in the provision of chemotherapy for the treatment of malignancy were the most frequent end-users of these implanted arm totally implanted venous access devices (TIVADs). The nurse manager of the Infusion Therapy Unit of Saskatoon Cancer Centre was notified of the use of 2 different port designs and provided information and education to the infusion nurses in regard to the 2 different ports being

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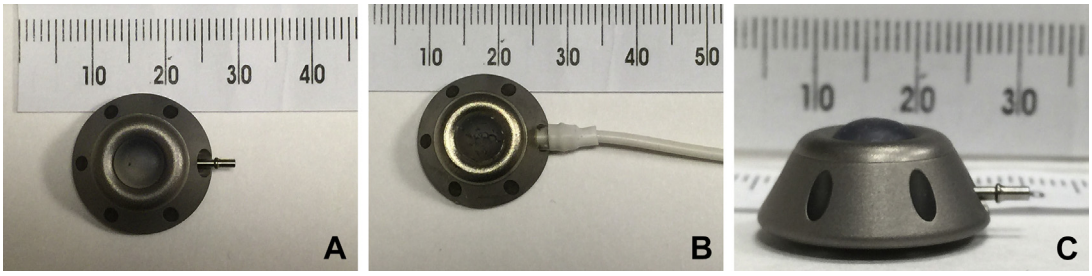

Figure 1. **Mini Titanium Vital-Port (Cook Medical, Bloomington, IN). A, Cranial caudal view, without the catheter attached. B, Cranial caudal view, with the catheter attached. C, Lateral view.**

implanted. Hence, due to the high frequency of port access events (50-75 access events per month), analysis of the influence of the 2 different port designs on infusion nurses seemed practical and efficient.

A questionnaire was designed by the nurse manager for infusion therapy (HD) and by a practicing radiologist (BB). Several revisions of the questionnaire were required. A search for publications discussing questionnaires of similar design was performed using MedLine, PubMed, Google, and Google Scholar. There were no similar questionnaires available for use based on this assessment in any previous literature. This questionnaire was not a statistically validated survey tool, but rather a quality assurance assessment tool (see the Appendix).

Lilienberg et al[2] previously performed a similar nursing assessment comparing 2 different designs of chest ports with a small forearm port. This study assessed 17 nurses who were asked to respond to 6 questions about the ports being accessed. The only statistically significant responses found pertained to a slow flow rate and difficulties with blood sampling when using the small forearm port. Five of the 17 respondents (29%) were unable to differentiate between the 2 chest port designs when they were asked to determine which type of chest port they were accessing.[2]

Appropriately trained, skilled nurses are expected to be able to access subcutaneously implanted venous ports of different sizes and shapes. The ability of infusion nurses to safely and reliably access these types of venous access devices can have a major influence on the quality of care received by patients during the course of their intravenous therapy. Ports used for intravenous therapy have variations in size, shape, palpable markers, and the surface area of their silicone septa. As part of the provision of care to patients with TIVADs, the nurse involved in the access procedure is expected to have had appropriate training and have knowledge of the locally available devices before access encounters. Blackburn states, "The nurse must clearly understand the principles of port and access site assessment, preparation of the access site, port identification, available needle types and styles, flushing, and care and maintenance such as dressing changes."[3]

The introduction of a new port has the potential to introduce complexity into the nurse—patient encounter. The goals of this project were to determine whether our local infusion nurses had any concerns in regard to accessing the 2 different ports and to see whether there was any differential between the 2 devices in regard to ease of needle access, port identification, number of access attempts required, experience of the infusion nurse, anxiety level of the patient, and a variety of other parameters.

Methods

A locally designed quality assurance questionnaire was created by a radiologist (BB) and by the nurse manager of infusion therapy (HD) in Saskatoon Cancer Centre, for the purpose of the project. The questionnaire used for this assessment is provided in the Appendix. This quality assurance project was approved by our local university research ethics committee. The questionnaire was completed by the infusion at Saskatoon Cancer Centre after every arm port access event for a 2-month period. All nurses participating were informed of the nature of the project and consented to participate. There were no incentives provided for study participation. The researchers were blinded to the identity of the questionnaire respondents.

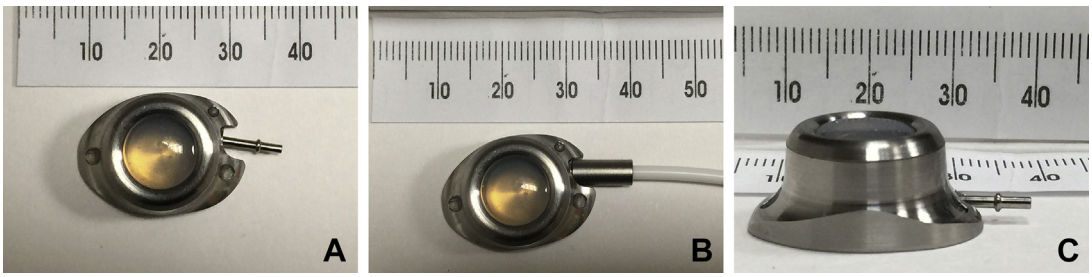

Figure 2. **Smart Port CT Mini (Angiodynamics, Latham, NY). A, Cranial caudal view, without the catheter attached. B, Cranial caudal view, with the catheter attached. C, Lateral view.**