

## Commentary: Totally Implantable Venous-Access Ports Complications Associated with Cancer Patients

Hiroshi Osawa<sup>1\*</sup>, Yohei Taura<sup>2</sup>, Hirokazu Akashi<sup>2</sup>, Haruhisa Endo<sup>2</sup>, Hiroyuki Shiobara<sup>2</sup>, Kazuo Ogiya<sup>2</sup>, Ichiro Saeki<sup>2</sup>, Sadao Takahashi<sup>2</sup> and Katsuo Shimoju<sup>2</sup>

<sup>1</sup>Department of Oncology and Hematology, Edogawa Hospital, Tokyo, Japan

<sup>2</sup>Department of Surgery, Edogawa Hospital, Tokyo, Japan

\*Corresponding author: Hiroshi Osawa, Department of Oncology and Hematology, Edogawa Hospital, 133-0052, Tokyo, Japan, Tel: +81336731221; Fax: +81336731229; E-mail: oosawa@edogawa.or.jp

Received date: May 30, 2017; Accepted date: June 22, 2017; Published date: June 27, 2017

Copyright: © 2017 Osawa H, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Keywords:** Venous-Access Ports; Cancer; Chemotherapy agents, Cancer patients

### Commentary

Recently, cancer chemotherapy agents have completely changed aspects such as anti-vascular endothelial growth factor (VEGF), anti-epidermal growth factor receptor (EGFR) and immune checkpoint inhibitors, associated with prolonging cancer patient's overall survival. Hence, patients with totally implantable venous-access ports (TIVAPs) have not only recourse to long-term nutrition management and pain control at home care, but also have recourse to cancer chemotherapy. Firstly, the TIVAPs can be classified as advantages and disadvantages. The reported advantages of TIVAPs were as follows; fewer needle stick, no restrictions on daily living and activity, less visible and more acceptable, less risk of infection, and less admission into hospitals. The reported disadvantages of TIVAPs were as follows; perioperative problems, anxiety from placing catheter into the body, and associate port or catheter related complications [1,2]. Subsequently, the TIVAPs cause several complications which exist in early and late stages. The aim of this commentary has been reported to consider complications of TIVAPs with cancer patients in single institute as a retrospective study. We observed 538 cancer patients who consisted of 313 of male and 225 of female from 2009 to 2016. The surgeon performed TIVAPs insertion from the internal jugular or subclavian vein *via* seldinger technique under fluoroscopic control with informed consent. We experienced two different devices, which were the Bard X-Port™, used from 2009 to 2012, and the Power Port™ used from 2012 to present. These devices are composed of titanium and a silicone rubber port (Dome Port™, Bard Inc. Salt Lake City, UT, USA) connected to an 8 Fr silastic Groshong™ catheter tube. We experienced 46 TIVAPs related complications with a rate of 8.6% (46/538). The early complications consist of pneumothorax, hemothorax, blood vessel damage, air embolus, hematoma and seroma. Our early complication was occurred 1.1% (6/538) of pneumothorax by the patient's condition, anatomy, and the type of cancers (pharyngeal, larynx, esophageal, etc.). The early complication of pneumothorax rate was reported 1-3% which rate was similar (1.1%) in ours [1,2].

The late complications consist of pinch-off, fibrin sheaths and fibrin sleeve, occlusion, catheter damage, infection and sepsis, catheter-related thrombosis, catheter disconnection, drug extravasation, wound-healing problems, port rotation, port-membrane rupture and skin necrosis reported [1,2]. Our late complications made up 7.5% (40/538) and were distributed as follows; 3.3% from complete occlusions, 1.7% from pocket infections, 0.9% from slip-off due to pedunculated breast, 0.55% from pinch-off, 0.37% from rubber port disconnection, 0.18% from catheter-related bacteremia, 0.18% from

wound dehiscence due to bevacizumab™, and 0.18% from rubber port rotation. The pinch-off and rubber port disconnection are popular complications of TIVAPs which was experienced at a rate of 1.9% in ours. If we found pinch-off signs, which are pain, infraclavicular discomfort, chest discomfort and swelling during infusion any solutions, we should check the patient's skin condition for edema, erythema, and tenderness. Furthermore, we should take an X-ray or chest computed tomography immediately. Especially, if elderly women had a pedunculated breast, we must be careful in planning the insert position and be sure to recognize TIVAPs position by X-ray every 2-3 months. We experienced 3.3% of occlusion, and the overall rate was reported between 1.9 and 8.0%, and thrombosis or embolism complication rate reported 1-11% [3]. Meanwhile, we reported that the thrombus of 12 cm with esophageal cancer patient who had poor performance status (PS), poor nutrition, long-term bed rest and chemo-radiotherapy even no catheter damage and malfunction. Furthermore, this case had cerebral infarction and high D-dimer level which diagnosed with Trousseau syndrome [4]. If a cancer patient had a high D-dimer level, poor PS (3 or 4) in the ECOG and poor nutrition, we should not insert the TIVAPs. Infection is the most frequent complication of TIVAPs. Despite the use of antiseptic barriers, a standardized surgical technique, we experienced 1.7% of pocket infection and 0.18% of Methicillin-resistant Staphylococcus aureus (MRSA) induced bacteremia which resulted from direct inoculation or migration of organisms along the accessing needle [4]. Recently, anti-VEGF monoclonal antibodies play a central role in cancer chemotherapy. We experienced wound dehiscence of insertion of TIVAPs three months later with an advanced colon cancer patient who was treated by bevacizumab combined chemotherapy [4]. If cancer patients receive anti-VEGF monoclonal antibodies combined chemotherapy, we should observe TIVAPs insertion scars. Finally, we must avoid these complications for cancer patients. Hence, we should obey the general maintenance and access procedures, such as wash hands, wear clean gloves, check skin condition for signs such as edema, erythema and tenderness, and perform sterilization methods [3].

### Conclusion

TIVAPs are necessary equipment for cancer patients who receive long-term nutrition, pain control and cancer chemotherapy. However, TIVAPs induced complications consistently occur in a small portion of cases. We should avoid TIVAPs-related and iatrogenic complications, even at a low complication rate. Hence, we should discuss with indication of TIVAPs by cancer-board. Furthermore, we not only observe the response for cancer chemotherapy but also must observe TIVAPs and the patient's condition. Finally, these solution strategies

are necessary in the training of medical staff and the education of the patients and their relatives.

## References

1. Kurul S, Saip P, Aydin T (2002) Totally implantable venous-access ports: local problems and extravasation injury. *Lancet Oncol* 3: 684-692.
2. Gallieni M, Pittiruti M, Biffi R (2008) Vascular Access in Oncology Patients. *CA Cancer J Clin* 58: 323-346.
3. Infusion Nurse Society, Policies and Procedures for Infusion Nursing (2011) 4th Edition 137-139.
4. Osawa H, Takazawa Y, Kameoka T, Yahai R, Hirosawa C (2016) Attention of cancer care for totally implantable venous-access ports associate complications the latest 6 years analysis of 400 cancer chemotherapy patients. *Int J Nurs Clin Pract* 3: 211-216.