

Impact of totally implanted venous access port placement on body image in women with breast cancer

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Abstract

Totally implanted venous access ports (TIVAPs) have been established as effective and safe devices for oncologic patients. In breast cancer setting, the implant of the reservoir at mid-arm allows the absence of additional scars on the chest and the easier access to the port with significant cosmetic and psychological advantages. In the last decades, breast surgery has made great progresses to ameliorate the cosmetic results even in mastectomy techniques. In fact, many studies have demonstrated that negative body image perception affects physical and psychological wellbeing of survivors. Despite this evidence, limited importance is still reserved to TIVAPs placement site, which is traditionally the chest. It is not unusual to see patients after a nipple-sparing mastectomy with excellent cosmetic result who show a disfiguring scar on their upper chest due to TIVAP placement. We report the case of a young woman with BRCA2-related breast cancer who underwent bilateral nipple sparing mastectomy with immediate reconstruction and adjuvant chemotherapy. Her TIVAP was located at the mid-arm, which is still an uncommon site compared to the upper chest. An optimal cosmetic result was obtained both in breast reconstruction and in the arm site of port, with high-rate patient satisfaction. This case presentation aims to raise awareness towards women's body image preservation, particularly in the choice of TIVAP placement: in most cases neckline and upper chest should be avoided for a better patient related outcome.

Keywords

Oncology access, techniques and procedures, totally implanted venous access ports, chest port, arm port, arm PICC-port, patient related outcome, breast cancer, body image

Introduction

Breast cancer is the most common malignant tumor in women and the leading cause of cancer-related death among females worldwide at any age. During the past few years, chemotherapy and immunotherapy have been increasingly applied with significant improvement in overall survival.¹ Therefore, an increasing rate of patients with breast cancer, especially young women, require long-term intermittent intravenous drug administration. The standard of care for long-term systemic treatments are TIVAPs. These devices are composed of an indwelling central catheter attached to a reservoir (port) placed in a subcutaneous pocket. Two pocket sites are routinely utilized in oncology: chest port or arm port. Chest port has been the most popular and reliable access site, commonly created in the anterior part of the thorax with the scar located in the upper

part of the chest, beneath the clavicle. Chest ports are usually inserted by puncture of the axillary vein or of the brachio-cephalic vein, less frequently via internal/external

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Figure 1. Double chest port scar in a young patient, due to infection of the first port which was then replaced. The patient got a tattoo to hide the scars.

jugular vein or subclavian vein. In few selected clinical cases, ports are inserted using an approach to the common femoral or the superficial femoral vein. Chest port position has always seemed appropriate because of the easiness of port puncture, while little or no interest has been shown for the cosmetic result. The use of very low profile reservoirs and appropriate closure of the pocket using intradermal stitches and cyanoacrylate glue can surely improve appearance, however avoiding at all an additional scar on the chest may gain a significant cosmetic and psychological advantage. The alternative of arm ports (mid-arm site implantation of reservoir), which have been introduced over time, has actually raised interest, even though higher risk of catheter-related thrombosis and implant's failure have been reported.² However, a modern version of arm port has been developed: the Peripherally Inserted Central Catheter (PICC)-port, which is an arm port implanted with the same state-of-the-art technique of PICCs (such as preprocedural ultrasound study, careful match between catheter size and vein size, ultrasound guided venipuncture, tip location by intracavitary ECG).^{3,4} The PICC-ports and the “old way” arm ports share the same benefits in terms of cosmetic results but differ dramatically in terms of late complications. In particular, the arm PICC-port shows exactly the same rate of late complications (including thrombosis) of a chest port, while have been reported lower infection rate, better cost-effectiveness ratio and less risk of pneumothorax. Moreover, PICC-port in early breast cancer patients, demonstrated low overall failure rate (3.8%) with excellent cosmetic results, even after removal at the end of chemotherapy.³⁻⁵ When PICC-port is bilaterally contraindicated and the placement of the pocket in the infraclavicular area must be avoided, an alternative novel technique of chest-to-arm tunneling allows the puncture of a central vein associated with an exit site at mid arm with optimal esthetic outcome.⁶

Based on these evidences, in an increasing number of Italian hospitals including ours, the routine use of chest-port is being changed by starting to use arm PICC-port technique.³ In particular, arm PICC-port has been positioned to young oncologic female patients. In our Breast Unit experience, we observed some unique advantages in the choice of the arm as TIVAP site, especially for the better cosmetic outcome and less perception of “foreign body” in women already dealing with strong body image changes related to surgery.⁷ Figure 1.

Body image during and after breast cancer treatment undergoes dramatic changes that negatively impact self-esteem, social functioning, sexuality, and quality of life.^{8,9} While breast oncologic and reconstructive surgery has made great progresses to maximize women's perception of body integrity during their patient's journey, this aspect is often overlooked in the TIVAPs placement choice; furthermore, literature data about breast cancer patient related outcome in term of quality of life after ports placement are still limited.¹⁰ We report our experience of the first case of an arm PICC-port instead of chest port placement in a young female patient treated in our hospital, who showed an optimal cosmetic result after treatment for breast cancer; the preservation of a positive body image perception was fundamental during all the healing process. This first experience supported by data from the Literature resulted in a change of clinical practice: most breast cancer women who need a TIVAP for chemotherapy in our Breast Unit receive now an arm PICC-port as first option approach.

Case description

The patient is a 36 years-old woman with a 20 kg/m² BMI, non-smoker, nulliparous, with no relevant pathologies. In March 2021, due to self-finding of a left breast nodule, she carried out radiological, clinical, and genetic

investigations, which led to the diagnosis of multicentric left breast invasive, hormone-sensitive, HER2 negative carcinoma with axillary lymph nodes involvement. Staging at diagnosis: cT2(m) cN2 M0, associated to a pathogenetic variant of BRCA2 gene. She underwent oocytes cryopreservation to preserve her fertility for the future. However, we had to delay breast surgery as first treatment step suggested by multidisciplinary team due to a symptomatic development, immediately after completion of diagnostic and preoperative workout, of Covid-19 disease while she was waiting for her first vaccination dose. After more than 1 month and the complete recovery from infection, in May 2021 the patient underwent bilateral nipple-sparing mastectomy through esthetic skin incisions at the mammary fold (for oncological treatment on the left side and for risk reduction in relation to BRCA2 pathogenetic variant on the right side), associated to left axillary dissection and bilateral breast reconstruction with tissue-expanders. Post-operative recovery passed without major surgical complications. The specimen pathologic examination confirmed a no special type breast invasive carcinoma on the left side, staging pT2 (m) (45 mm, 17 mm) pN3a (18/30) M0, hormone-positive (ER 99%, PgR 80%), HER2 negative, Ki67 18%, with diffuse lymphovascular invasion. On the right side an occult 6 mm breast invasive carcinoma was also found, hormone-positive, HER2 negative, without lymphovascular invasion, associated with extensive ductal carcinoma in situ (tumor staging on the right breast: pT1a). Even though breast cancer was advanced from the beginning, based on preoperative assessment, we observed a rapid progression of the disease during Covid-19 infection. We rediscussed the case after surgery in a multidisciplinary meeting establishing indication to adjuvant chemotherapy, hormonotherapy, and left side radiotherapy. The woman was the first patient in our hospital whose TIVAP was located in the upper part of the right arm instead of the routine chest position, according to the evolution of the best scientific evidences and clinical practice. The port used was a Polysite implantable venous PICC-port Vygon®, implanted with the current echo-guided standards. A 5Fr polyurethane catheter was inserted through the basilic vein (length 34 cm) and was connected with a very low profile reservoir. Anthracycline-taxane based chemotherapy was administered through this arm PICC-port TIVAP. Adjuvant radiotherapy was also completed and endocrine therapy associated with Abemaciclib was started. We then proceeded with cautious tissue-expanders' inflations after radiotherapy. The last surgical visit was on 1st October 2022: at 17 months follow up the woman is free from disease. She expressed great satisfaction for the esthetic result both with breast skin/nipple conservation with immediate reconstruction and arm port placement, since no surgical scars were visible on both breasts and upper chest, so that the young woman showed a fine neckline. Figure 2. No limitations in her personal life were encountered, both in the working field



Figure 2. Esthetic result of bilateral nipple-sparing mastectomy and first-step reconstruction with tissue expanders in our patient, who underwent adjuvant chemotherapy throughout an arm port. The arm port placement did not affect the cosmetic outcome of breast reconstruction.

and in the sexual life. Tissues' healing was normal and no infectious or thrombotic complications on the port site occurred. She is now eligible for tissue-expanders removal and bilateral breast implants location, with possible need of surgical esthetic procedures in the future (lipofilling) due to long-term radiotherapy local side effect. On a scale of 1 (most negative) to 10 (most positive), the patient related outcome was reported as very high (9/10) by the woman herself; in particular she reported that the port system was a very positive enhancement to her oncologic treatment and expressed great satisfaction for the arm site of the port instead of the chest option. The young woman stated to the psycho-oncologist that her quality of life is going well; both double mastectomy and port placement had little impact on daily activities, body image, and social/sexual life.

Conclusions

TIVAPs are increasingly applied in the systemic treatment of breast cancer patients. Many studies have compared chest ports to arm ports in relation to complications and insertion techniques. While the safety of the arm PICC-ports is currently evidence-based, less importance is still given to its esthetic outcomes. This report has the aim to raise the issue of TIVAPs' cosmetic result, particularly in women treated for breast cancer. From this first patient, we changed our clinical practice and suggest considering this new approach whenever possible: in particular, based on the cosmetic and psychological advantages without an increased rate of complications, PICC-ports should be the first option for breast cancer patients in order to avoid disfiguring chest scars and improve patient related outcome.

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Ethics and informed consent

The participant provided written informed consent for the publication of this report and of any potentially identifiable images (not including face) or data published in this article. Data of this case report are available on written patient's medical records archived at Fondazione IRCCS Policlinico San Matteo, Pavia, Italy.

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