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Great Saphenous Vein Cut-Down as an Access for The Implantation of a Total Inplantable Venous Access Port

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1. Abstract

1.1. Background: Because the central or peripheral veins that drain to the superior vena cava (SVC) can become exhausted or because of other clinical problems, other access routes, such as the great saphenous vein (GSV), may be needed for cancer patients undergoing intravenous chemotherapy.

1.2. Case Presentation: A 65-year-old female patient with bilateral infiltrating breast carcinoma and bilateral lymphedema of the upper limbs required intravenous chemotherapy. A Total Implantable Venous Access Port (TIVAP) was implanted using Great Saphenous Vein Cut-Down (GSVC) with port placement in the anterior thigh. There were no complications.

1.3. Conclusion: The implantation of a TIVAP using GSVC is a simple technique with a short surgical time and without complications.

2. Introduction

Since Niederhuber1 implanted in 1981 the first Total Implantable Venous Access Port (TIVAP) through Cephalic Vein Cut-Down (CVC) for chemotherapy infusion in cancer patients, central veins or peripheral upper-limb veins that drain to the Superior Vena Cava (SVC) have been commonly used for this purpose, with percutaneous insertion performed using landmark or ultrasound-guided methods [2] or the cut-down technique [3]. However, in patients with central vein or SVC occlusions, complicated bilateral breast cancer, infection, skin metastases or radiogenic dermatitis, the main alternative was the placement of a TIVAP in veins that drain to the inferior vena cava (IVC). The main access route used is the Common Femoral Vein (CFV) [4]. Very few researchers [5] have described implantation using the Great Saphenous Vein (GSV). We report the case of a patient in whom this access route was used

3. Case Presentation

A 65-year-old female patient attended our practice in March 2021 reporting no personal history of interest, no unhealthy habits or known drug allergies. On physical examination, she presented with a large ulcerated exudative lesion on the anterior chest wall that had replaced both breasts and several satellite nodules around them, as well as skin lesions that extended through the abdominal and dorsal wall; bilateral supraclavicular and axillary adenopathies; and lymphedema of both upper limbs, all from years of progression (Figure 1).

Figure 1: Skin lesions on the patient.

The cervical/thoracic/abdominal/pelvic CT scan revealed metastases in the costal arches, left clavicle, dorsal vertebral bodies and left iliac crest at the bone level. At the abdominal level, metastatic liver and retroperitoneal lesions were observed. The result of the breast biopsy was grade 2 infiltrating ductal carcinoma (ER 3+ 100%, PgR 3+ 80%, Ki67 30%, HER2 2+ SISH positive [HER/CEP17 ratio = 2.19]). With the aforementioned result, a chemotherapy and radiotherapy treatment for lytic bone lesions was decided on. Due to the bilateral involvement, presence of cervical lesions and major lymphedema of the upper limbs with absence of peripheral veins for blood draws and intravenous chemotherapy infusion, after a meeting between the medical and surgical teams, it was decided to implant a TIVAP by right Great Saphenous Vein Cut-Down (GSVC). After Information on the surgical technique was provided to the patient, who subsequently signed the informed consent, the surgical intervention was scheduled.

On May 11, 2021, with the patient in the supine position in the operating room, an ultrasound scan was performed on the upper 1/3 of the right inner thigh with a Venue 40 ultrasound machine (GE Healthcare) to locate and describe the proximal path, which was rectilinear, and the GSV dimensions (diameter: 5.5 mm). Subsequently, under local anesthesia with 2% mepivacaine (B-Braun), a 3-cm longitudinal incision at this level, followed by dissection of the GSV, passage of 2/0 Polysorb sutures (Covidien), distal ligation of the GSV, and longitudinal venotomy were performed. With the help of a vein pick, the catheter of a Nu Port HP® system (PHS MEDICAL), consisting of a titanium single-chamber port and a 9F silicone catheter, was introduced. By fluoroscopic control with a BV Pulsera device (Philips), the tip of the catheter was found to be in the IVC near the renal bifurcation. Reflux was checked using¬ aspiration, followed by sealing of the catheter with 10 cc of hepa¬rinized serum (100 cc of glucose serum with 1 cc of 5% Na-hepa¬rin). Proximal ligation of the GSV was then performed to affix the catheter. After local anesthesia, a 2-cm transverse incision was made in the middle of the anterior thigh to create the subcutaneous chamber that will house the port. This was followed by passage of the catheter from the venotomy incision to the port chamber, connection of the catheter to the port and fixation of the port in the anterior aspect of the anterior rectus muscle with 3/0 Prolene sutures (Ethicon). Reflux was checked again by transcutaneous access to the port with a Huber needle and the system was sealed with heparinized serum. The incisions were closed with 3/0 Prolene sutures. For presentation of the case, radiological control was carried out (Figure 2). The intervention time from local anesthesia application to incision closure was 21 minutes. There were no intraoperative or postoperative complications. Currently (February 2023), the TIVAP is functioning normally.

Figure 2: Surgical technique and radiographic control.

4. Discussion

In between 0.25% [6] and 1.4% [5] of cases, it is impossible to implant a TIVAP in the SVC on the large venous trunks or their collateral vessels due to the causes described in the introduction. This rate in our department is 0.18% (two cases out of 1100 implants). In these cases, the common femoral vein is the most commonly used access in most cases [4], but recently, the use of ultrasound-guided cannulation of the superficial femoral vein has been described [7]. The implantation of a TIVAP by GSVC has been taken up again recently by Wu [5] and Jim [8], who advocate this route in the case of pathologies that prevent access to the SVC, reporting a rate of infectious complication of 2.2% and of mechanical complications of 4.4%. Lastly, Kato [4], Goltz [9] and Toro [10] agree that the best site to implant the port is on the middle third of the anterior thigh muscle.

5. Conclusion

In the future, whenever the anatomy allows it, our group will choose to implant the TIVAP using GSVC in cases where it is necessary to access the IVC, due to the simplicity of the technique and the short surgical time to perform it.

6. Author Contributions

The authors have also contributed to the writing of this paper.

7. Consent for publication

Consent for publication was obtained from the patient.

8. Competing Interests

The authors declare that he has no competing interests.

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