Pectoralis (PecS) nerve block 1 for port-a-cath removal and central venous catheter (CVC) replacement

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ABSTRACT

Aim The use of PecS block 1 as perioperative analgesia for a central catheter removal-reimplantation combined procedure.

Methods A 55-year-old woman suffering from peritoneal metastases from gastric cancer needed to have a port-a-cath implanted for infection removed and to have a central venous catheter (CVC) implanted in the homolateral axillary vein due to patient’s history of deep vein thrombosis of the right upper limb. We used PECS 1 block for perioperative analgesia.

Results Compared to the traditional catheter implantation technique, reduction in the doses of local anaesthetics, shortening in the execution time, less intra-procedural bleeding, better patient’s compliance, and no need for a rescue dose of local anaesthetic were observed.

Conclusion The PEC1 block was effectively and safely used to remove an infected port-a-cath and to place a CVC on the same side. We hypothesize that it may be useful also for simple port-a-cath positioning.

Key words: complication, local anaesthesia, outcomes, pectoralis block, port-a-cath
INTRODUCTION

Pectoran nerve (PecS) block 1 is a simple analgesic block performed by means of a local anaesthetic administration in the layer that separates two pectoral muscles, the pectoralis major and the pectoralis minor, at the level of the third rib (1). The interfascial administration of 20 mL of local anaesthetic is suitable to block the lateral pectoral nerve and most of the branches of the medial pectoral nerve (2). The block is performed with a linear probe positioned 3-4 cm distal to the coracoid process with a transverse view of the pectoralis minor muscle (3). It has been successfully used for perioperative analgesia in adult breast surgery (1-4) and minimally invasive cardiac surgery (3).

The traditional approach to the local anaesthesia for port-a-cath implantation requires the administration of 25-35 mL of local anaesthetic (4). It also needs two or three site punctures for best accomplishment, this being especially risky in patients on anticoagulant therapy (1-4). Moreover, it does not adequately reduce pain during the creation of the pocket for the port-a-cath chamber placement (1-4).

We hypothesize that PecS block-1 may reduce both the dose of the local anaesthetic and the relative risk of toxicity, the number of site punctures required and, of course, ongoing pain during the creation of the pocket; this approach may work not only in the plant, but also in the removal of the port-a-cath.

The aim of this study was to describe this approach in one of our patients (5,6), who needed to have the port-a-cath for infection removed, and a new central venous catheter implanted.

PATIENT AND METHODS

Patient and study design

We presented a case of a 55-year-old woman suffering from peritoneal metastases from gastric cancer previously treated with radiotherapy and surgical removal. She had no other relevant diseases in her past medical history. She had no coagulation deficiency but she was on anticoagulant treatment with low molecular weight heparin for prevention of venous thromboembolism and chemotherapy for neoplasm treatment. Our attention was drawn to the septic state due to infection of the implanted port-a-cath (in the left axillary vein) by *Bacteroides vulgatus*. In addition to this, the lack of peripheral venous access and the need to continue antibiotic therapy and parenteral nutrition required the placement of a new central venous catheter (CVC) after the removal of the port-a-cath.

Methods

According to the RaCeVA protocol (7), we performed systematic ultrasound examination of the venous system and excluded implanting the new CVC in the right axillary vein due to the patient’s history of deep vein thrombosis of the right upper limb and because the vessel did not show any patency while imaging (lack of collapse if compressed). Thus, we decided to remove the left axillary port-a-cath and to position the new central catheter in the homolateral axillary vein. With an ultrasound-guided and sterile technique, PecS block 1 was performed (Figure 1) with mepivacaine 200 mg and levobupivacaine 50 mg.

![Figure 1. The PecS block 1 performed with an ultrasound-guided technique. The needle tip reaches and injects the local anesthetic mixture in the layer between the pectoralis major and pectoralis minor muscles (left); the 2nd rib acts as a protecting fence against unintentional pleural puncture (Ripani U, 2018)](image)

PM, pectoralis major muscle; Pm, pectoralis minor muscle; LA, local anesthetic mixture injected

RESULTS

The patient presented mild pain at the incision of the pocket (numeric rating scale, NRS: 4) (8), while all other phases of the procedure (port-a-cath removal, pocket closure, ultrasound-guided puncture of the axillary vein, CVC implantation) were pain...
free (NRS: 0). There were no immediate complications, such as bleeding. The procedure was judged easy to perform by the operator and it required about 30 minutes for completion (Figure 2). It was observed that the dose and volume of the used anaesthetic was reduced comparing to the classic method. Within one month after the procedure the patient did not show any late complication.

DISCUSSION

In this case we performed an ultrasound-guided PecS block 1 with 20 mL of local anaesthetic (mepivacaine 1% 10 ml and levobupivacaine 0.5% 10 ml) to provide analgesia for a central catheter removal-reimplantation combined procedure. A skin incision was made in the left port-a-cath site. The catheter was removed and its pocket was closed. A two-way CVC was then placed in the same left axillary vein with an US-guided technique. There are no similar procedures described in the literature. Moreover, we did not find any published study comparing port-a-cath placement and removal under the local anaesthesia with the classic technique and PecS -1 block.

REFERENCES


Recently, a clinical experience on children undergoing implantation and removal of port-a-cath has been published by the Stanford hospital (2). Authors have retrospectively analysed the impact of PecS 1 block versus the traditional technique on the need for rescue analgesia, long acting opioids use, postoperative pain scores and post-anaesthesia care unit length of stay; all parameters analysed were in favour of the PecS 1 group but without showing any statistical significance, perhaps due to small sample.

In our experience we routinely performed the same comparison on adult patients and we observed a reduction in the doses of local anaesthetics, a shortening in the execution time, less intra-procedural bleeding, better patient’s compliance, and no need for rescue dose of local anaesthetic. Thus, we hypothesize that PecS 1 approach may be used successfully to implant a port-a-cat, replacing the traditional approach.

The PECS block has already been used successfully in breast surgery, pacemaker placement and upper limb surgery (1,3, 9-26). We have effectively and safely used the PecS 1 block to remove an infected port-a-cath and to place a CVC on the same side with a reduction of pain and doses of local anaesthetic used and without any early or late complication. We hypothesize that it may be useful also for port-a-cath positioning in terms of reduction of local anaesthetic doses and relative risk of toxicity, reduction of the risk of periprocedural complications (such as bleeding). However, as there are currently no randomized trials in literature confirming these hypotheses and clinical observations, large sample clinical trials are needed yet.

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TRANSPARENCY DECLARATION

Conflict of interest: None to declare.


