Acute Pain Related to Vascular Access Port Implantation in Adult Cancer Patients: A Prospective Assessment

Nesrine Mejri, MD
Manel Haj Mansour, MD
Soumaya Labidi, MD
Houda El Benna, MD
Mehdi Afrit, MD
Hamouda Boussen, Pr
Medical Oncology Department, Abderrahmane Mami Hospital, Ariana, Tunisia

Abstract

Background: *We aimed to describe characteristics of acute pain related to port-a-cath implantation (PACI) in an oncology department.*

Methodology: *We prospectively followed 145 patients who received PACI under local anesthesia. Our study asked patients to rate their pain according to a numerical scale immediately after implantation and within 72 hours. Patient and disease characteristics, PACI data, pain peak, and need for analgesic agents were collected. Patients already taking painkillers were excluded.*

Results: *Median age was 55 years (range = 28-83 years) and 71% were women. Pain after PACI was rated mild by 52.4%, moderate by 35.9%, and severe by 11.7% of patients. Pain peaks were described during introducer insertion (40.7%), venous puncture (23.4%), anesthesia (18.6%), tunneling (5.9%), and suturing (1.4%). Patients with severe pain were significantly more frequently women and had a fast heart rate (≥120 bpm) before PACI (94.1% vs. 68% [P = .018] and 11.8% vs. 3.9% [P = .021], respectively). Within 72 hours of PACI, 56% of patients experienced no pain, 24.1% had mild pain, 6.2% had moderate pain, and 10.3% had severe pain. All patients who needed to use painkillers (39%) used acetaminophen.*

Conclusions: *Women and patients with heart rate ≥ 120 bpm before PACI should probably be considered for systematic painkillers after the implantation.*

Keywords: *port-a-cath, implantation, acute pain, local anesthesia*

Introduction

Totally implantable venous access devices, or port-a-cath (PAC), is a routine oncology practice first introduced in 1982. It represents a convenient option when long-term intravenous therapy is needed. Port-a-caths also do not require external dressing and are useful for avoiding venous toxicity.[1] The current literature regarding PAC use in clinical practice is focused on the description of insertion techniques, maintenance, and complications.[2] Acute pain experienced by patients related to PAC implantation (PACI) is rarely described. Determining location, temporal aspects, and pain intensity at times is not enough to accurately describe pain when assessing pain caused by an acute medical disease or medical intervention. The well-known visual analog scale (VAS) and numeric rating scale (NRS) for assessment of pain intensity are widely used. Both scales are equally sensitive in assessing acute pain and superior to a 4-point verbal categorical rating scale. A study using simultaneous recordings of pain intensity

Correspondence concerning this article should be addressed to nesrinemejriturki@yahoo.fr
http://dx.doi.org/10.1016/j.java.2017.04.003

on VAS, NRS, and a 4-point verbal categorical rating scales in a large number of patients demonstrated the power to detect a difference in pain intensity was higher with the NRS and the VAS compared with the verbal categorical rating scale.[3,4] In our prospective study, we aimed to describe characteristics of acute pain related to PACI in cancer patients.

Methods

Patients

Between October 2015 and April 2016, we studied patients diagnosed with cancer who received PACI from the medical oncology department at Abderrahmane Mami Hospital. The study considered data concerning sex, age, body mass index, past history, underlying disease and therapy from patient records. We also collected data about PACI management such as blood pressure and heart rate before the procedure, side of insertion, implant duration, number of venous punctures, and immediate complications. The study only included patients over the age of 18 not suffering cognitive impairment or dementia and excluded patients already under analgesics. All patients gave informed consent to participate in the study.

PACI Technique

The first and last authors listed performed PACIs in the operating theater under local anesthesia, using blind puncture. All patients received Lidocaine topical solution (30 mg) in their subcutaneous tissues. The right side represented the routine technique unless the patient had right side breast cancer, multiple cervical lymph nodes or a history of right side radiation therapy. The internal jugular vein also served as the routine technique. The study used a puncture needle to pierce the vein via the Seldinger technique. Next, it inserted a guide wire into the vein through the needle, with the needle withdrawn over the wire. A skin incision in the deltopectoral groove prepared a port pocket, before fixing the PAC on the fascia pectoralis in the infraclavicular area. The catheter passed through one incision to the other through a subcutaneous tunnel, with a 'peel-away sheath' advanced over the guidewire and into the vein. Following removal of the dilator component of the peel-away sheath, the study introduced the catheter through the sheath and advanced it into position. A flushing-reflux test insured PAC fluid flow before stitches closed the skin incisions. A chest X-ray followed catheter placement to visualize the location of its tip and exclude a pneumothorax. This procedure did not include the administration of prophylactic antibiotics.

Pain Assessment

Immediately after PACI, patients, at rest, revealed the level of pain they experienced during the procedure on a 0 to 10 scale, with 0 = 'no pain' to 10 = 'worst pain imaginable.' Asked to rate the pain according to NRS, the study identified it as 'early pain.' Patients also described the peak moment of their pain to the operator, who then reminded them that they will receive a phone call within 3 to 7 days. All patients could use painkillers if needed after the interview or once back home. After 3 to 7 days, the operator called all patients and asked them to rate the pain experienced in the first 72 hours following PACI according to NRS. The study identifies this as 'late pain.' We also asked about the need and use of painkillers and the type of drug used in that time period.

Patients rated mild pain 1-3 on the NRS, moderate pain 4-6 and severe pain 7-10.

Statistical Analysis

The study considered p-values <0.05 significant for frequencies compared to Fisher's exact test or Chi-squared analysis.

Results

We recruited 145 patients during the study period and completed a total of 145 interviews. Three patients had PACI twice: two for vein puncture failure and one for catheter tip mal position (axillary). Patient characteristics are described in Table 1.

Sixty-nine percent (100) of patients received PACs on their right side. Blinded vein puncture occurred more than once in 43.4% (63) of patients.

Evaluation of early pain rated mild in 52.4% (76) of patients, moderate in 35.9% (52) and severe in 11.7% (17). The pain peaked at various times during the procedure. In 40.7% of patients, it peaked at introducer insertion, at venous puncture in 23.4%, anesthesia in 18.6%, tunneling in 15.9% and sutures in 1.4%. Early pain population characteristics according to NRS groups are described in Table 2.

Using Fisher exact test or χ^2 analysis, we compared several subgroups in search of significant characteristics associated with severe vs. nonsevere (ie, mild or moderate) pain occurrence.

Female patients reported severe pain more often than male at a rate of 94.1% vs. 68%, with a significant p value of 0.018. Severe pain patients also experienced tachycardia (>120 bmp) before the procedure more frequently, 11.8% vs. 3.9% (P value = 0.021). There was a trend to express severe pain in patients that received more than one venous puncture but without reaching statistical significance (52.9% vs. 40.8%, $P = 0.24$).

The study observed no statistically significant difference with regards to obesity, long PACI duration (>30 minutes), left side implantation and past chemotherapy.

A total of 126 patients (86.8%) responded to the study's late pain phone call, with more than half of responders not having to tolerate any.

Fifty-six percent did not feel pain, 24.1% (35) described the pain as mild, 6.2% (9) had moderate pain and 10.3% (15) suffered from severe pain. In 39.6% (49 out of a possible 126), patients needed painkillers. All patients used simple moderate pain analgesia with paracetamol. Compared to patients who did not use pain killers, patients who used them had significantly more severe pain in the "acute pain" evaluation (16.9% vs. 8.5%, $P = 0.02$) and also in 'the late pain' evaluation (15.3% vs. 7.2%, $P = 0.03$). Among the 15 patients (all women) who rated their late pain as severe, 1 rated