

Anomalies in Chemoport Insertion: Unraveling the Complexity of Guidewire Knotting in a Patient with Hodgkin's Lymphoma - A Case Analysis

Fuyuko Nishida¹, Shinju Obara^{1,2}, Saori Takatsuki¹, Yuko Nakano¹, Satoki Inoue¹

¹Department of Anesthesiology, Fukushima Medical University School of Medicine, ²Center for Pain Management, Fukushima Medical University Hospital, Hikarigaoka, Fukushima, Japan.

ABSTRACT

Postoperative pain with motion can severely limit mobilization and rehabilitation, emphasizing the need for effective analgesic strategies. A 26-year-old male with hidradenitis suppurativa involving both inguinal regions, both axillae, and the perianal area underwent three debridement sessions under general anesthesia, resulting in open wounds. Pain at rest showed a downward trend with oral administration of milogabalin, tramadol, acetaminophen, and celecoxib. However, the patient was utterly unable to get out of bed due to severe pain when he moved especially in the groin and perineal areas. Administration of a mixture of fentanyl and ketamine using an intravenous patient-controlled analgesia (IV-PCA) device was prescribed (administered twice 15 minutes apart before afternoon rehabilitation). The patient regained mobility from the first day of administration. The use of IV-PCA was discontinued on POD 21. The patient was discharged uneventfully on POD 28. Administering opioids intravenously in a setting without direct physician supervision presents significant management challenges. In such situations, there are advantages to using IV-PCA devices for preemptive analgesia.

Key Words: Fentanyl, Intravenous patient-controlled analgesia, Motion pain.

Received: 28 December 2023, **Accepted:** 18 May 2024

Corresponding Author: Shinju Obara, Associate Professor, Department of Anesthesiology, Fukushima Medical University School of Medicine, Hikarigaoka, Fukushima, Japan, **Tel.:** +81-24-547-1342, **E-mail:** obashin99@gmail.com

ISSN: 2090-925X, Vol.17, No.1, 2025

INTRODUCTION

Postoperative pain with motion can severely limit mobilization and rehabilitation, emphasizing the need for effective analgesic strategies. Herein, we describe a case in which preemptive analgesic administration using an intravenous patient-controlled analgesia (IV-PCA) device contributed to mobilization in a patient with motion pain after skin debridement.

A 26-year-old male (weight, 103kg; height, 178cm) with hidradenitis suppurativa involving both inguinal regions, both axillae, and the perianal area underwent three debridement sessions under general anesthesia (at 14-day and 21-day intervals), resulting in open wounds (Figure 1). From the second day after the third surgery, sedation for surgical wound care was performed each morning under the supervision of an anesthetist, by administering propofol (60–110mg), ketamine (30–100mg), and fentanyl (100–200µg). Pain at rest showed a downward trend with oral administration of milogabalin 20mg/day, tramadol 300mg/day, acetaminophen 2.6g/day, and celecoxib 400mg/day. However, the patient was utterly unable to get out of bed

due to severe pain when he moved especially in the groin and perineal areas. On postoperative day (POD) 8, our department was consulted regarding pain management. According to the Functional Independence Measure (FIM) [1], the patient scored 1 (total assistance) on all items related to transfers (bed, toilet, wheelchair, toilet transfers, bathtub, shower) and mobility (walking, wheelchair, stairs). Pain intensity on the Numerical Rating Scale (NRS) was approximately 5/10 at rest, and with even slight movement or wound care caused pain of 10/10. Administration of a mixture of fentanyl and ketamine (single dose of fentanyl 50µg + ketamine 2.5mg) using an IV-PCA device was prescribed (administered twice 15 minutes apart before afternoon rehabilitation). The patient regained mobility from the first day of administration. On POD 12, he was able to walk around the ward using a walker. The IV-PCA dose was reduced on POD 13 (fentanyl 37.5µg + ketamine 1.9mg), then on POD 20, low stair climbing was possible and supervision by anesthetists for sedation for wound care was discontinued. The use of IV-PCA was discontinued on POD 21. There were no changes in the oral medication

regimen during this period. The patient was discharged uneventfully on POD 28. The FIM score improved to 5 points (partial assistance) on all items.



Figure 1: The condition of the perineal area after the third surgery.

Local or regional anesthesia is preferable to systemic analgesia for pain relief during movement. Although epidural anesthesia was considered, it was not performed because of the risk of complications such as catheter site infection, as well as falls due to muscle weakness. Dexmedetomidine has been reported to be effective for pain relief during rehabilitation; However, we lack sufficient experience with its use in general ward settings. In the present case, the anesthesiologists had performed daily sedation and analgesia during procedures, and had accurately determined the fentanyl dosage that minimised the risk of respiratory depression. Specifically, they found that a 100µg bolus of fentanyl did not induce respiratory arrest, with the peak fentanyl concentration at the site of action reaching 1.1ng/mL at 3.5 minutes post-administration, as simulated by the Shafer Pharmacokinetic model [2]. Low-dose intravenous fentanyl and ketamine were clinically feasible and experimentally tested; however, the availability of anesthesiologists for ward rehabilitation was limited due to staffing constraints. Therefore, after a thorough discussion of precautions

with the staff, including the possibility of staggering, we implemented preemptive analgesia using an IV-PCA device as a continuation of postoperative analgesia to facilitate active patient movement. The fentanyl effect-site concentration in the method presented was estimated to be a maximum of 0.9ng/mL. It is important to note that the typical fentanyl effect-site concentration that suppresses pain with body movement without causing respiratory depression in a case such as ours is unknown. Therefore, it is necessary to estimate the appropriate dosage for each patient individually. Postoperatively, pain reduction was expected due to healing and epithelialization of the wound site. However, as this took time, early mobilization with pain management was effective in preventing immobilization-induced disability.

To the best of our knowledge, there are no reports of the use of IV-PCA devices for preemptive analgesia in postoperative rehabilitation. Administering opioids intravenously in a setting without direct physician supervision presents significant management challenges. In such situations, there are advantages to using IV-PCA devices for preemptive analgesia. This approach warrants further investigation on a larger scale.

CONFLICT OF INTERESTS

There are no conflicts of interest.

REFERENCES

1. Linacre JM, Heinemann AW, Wright BD, Granger CV, Hamilton BB. (1994). The structure and stability of the Functional Independence Measure. *Archives of physical medicine and rehabilitation* 75:127-132.
2. Shafer SL, Varvel JR, Aziz N, Scott JC. (1990). Pharmacokinetics of fentanyl administered by computer-controlled infusion pump. *Anesthesiology* 73:1091-1102.