



## Pain Management after Bilateral Mastectomy Surgery with Continued Intravenous Ketamine: A Case Report

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### ABSTRACT

**Introduction:** Ketamine is recommended as postoperative analgesia because ketamine is a classic anesthetic agent that is available in almost all hospitals, including hospitals with limited resources. This study aims to describe the continuous use of intravenous ketamine as postoperative pain management in a bilateral mastectomy. **Case presentation:** A woman, 35 years old, was admitted to the hospital with complaints of lumps in both breasts. On physical examination, the patient looked weak, with blood pressure 120/70 mmHg, pulse 105x/minute, respiratory rate 18x/minute, temperature 36.8°C, and numeric rating scale (NRS) 7/10. In the thoracic region, mammary dextra, there is a lump the size of a fixed tennis ball, 15 cm in diameter, and the skin around the lump looks red with a dry wound. On palpation, there is tenderness and hardness; mamma sinistra has a lump the size of a melon, 20 cm in diameter, with an ulcer that is still wet. On palpation, there is tenderness and hardness, and fixation. The patient was diagnosed as mammary tumor dextra et sinistra, suspected malignancy, and a simple bilateral mastectomy was performed. The anesthetic technique used during the operation was general anesthesia with endotracheal intubation (GETA). The premedication given was dexamethasone 10 mg intravenously, midazolam 3 mg intravenously, and fentanyl 100 mcg intravenously. Postoperative pain management using ketamine 0.15 mg/kgBW was given a bolus, followed by 0.1 mg/kgBW/hour. **Conclusion:** The use of ketamine in postoperative bilateral mastectomy can reduce pain intensity and have minimal side effects.

**Keywords:** anesthetic agent, intravenous, ketamine, pain, postoperative pain.

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## Introduction

Post-surgical pain management is not optimal and is still often neglected, even though the knowledge of post-surgical pain mechanisms has made a lot of progress. Previous studies stated that about 80% of patients experience acute postoperative pain.<sup>1,2</sup> Other studies reported that around 41% of patients experienced moderate and severe pain from day 1 to day 4 postoperatively.<sup>3</sup>

Various modalities have been used in the management of postoperative pain, one of which is ketamine.<sup>4,5</sup> First synthesized in 1963, ketamine has long been recognized as an intravenous anesthetic.<sup>6-9</sup> The antagonistic effects of ketamine on N-Methyl-D-Aspartate (NMDA) receptors have made ketamine an agent of interest to researchers. However, despite ample recent evidence regarding the important role of NMDA receptors, clinical research on the use of ketamine in the treatment of postoperative pain is still incomplete.<sup>10</sup>

The use of a single dose of ketamine as preemptive analgesia will not produce prolonged analgesia into the postoperative period, given the short duration of action of ketamine.<sup>11</sup> Therefore, several studies recommend giving ketamine infusion after a single bolus dose for adjuvant analgesia, including a combination of epidural analgesia/anesthesia and intravenous low-dose ketamine for pre-emptive analgesia. The recommended dose of ketamine is 1 mg/kg BW (initial dose) and 0.5 mg/kg/hour (continuous dose).<sup>11,12</sup> Ketamine is recommended as postoperative analgesia because ketamine is a classic anesthetic agent that is available in almost all hospitals, including hospitals with limited resources.<sup>13</sup> This study aims to describe the use of continuous intravenous ketamine as pain management in a postoperative bilateral mastectomy.

## Case Presentation

A woman, 35 years old, was admitted to the hospital with complaints of lumps in both breasts. This lump has been experienced for the last 2 years. At first the lump first started in the left breast, the size of a chicken egg which enlarged and was then operated on a year ago. Patients rarely go to the hospital after surgery. A lump in the right breast has been felt for the last 6 months, which has gotten bigger and bigger, like a lump on the left. Pain has been felt in both breasts for the last 2-3 months, which is very disturbing during activity and rest. There was no history of previous serious illness.

On physical examination, the patient looked weak, with blood pressure 120/70 mmHg, pulse 105x/minute, respiratory rate 18x/minute, temperature 36.8°C, and numeric rating scale



(NRS) 7/10. In the thoracic region, mammary dextra, there is a lump the size of a fixed tennis ball 15 cm in diameter. The skin around the lump looks red with a dry wound. On palpation, there is tenderness and hardness; mamma sinistra has a lump the size of a melon, 20 cm in diameter, with an ulcer that is still wet. On palpation, there is tenderness and hardness, and fixation. Routine blood tests showed results within normal limits. The patient was diagnosed with mammary tumor dextra et sinistra, suspected malignancy, and a simple bilateral mastectomy was performed.

The anesthetic technique used during the operation was general anesthesia with endotracheal intubation (GETA). The premedication given was dexamethasone 10 mg intravenously, midazolam 3 mg intravenously, and fentanyl 100 mcg intravenously. Postoperative pain management using ketamine 0.15 mg/kgBW was given a bolus, followed by 0.1 mg/kgBW/hour. Follow-up pain after surgery is presented in Table 1.

Table 1. Follow-up pain.

Hours to	NRS		Vital signs			Side effects
	Rest	Moves	BP	N	P	
1	5/10	6/10	140/90	98	22	Dizziness, feeling of spinning
4	4/10	5/10	132/82	95	20	Dizziness
8	3/10	4/10	135/73	82	20	No complaints
12	1/10	3/10	124/68	80	20	No complaints
24	1/10	2/10	136/63	102	20	No complaints
32	1/10	2/10	120/52	90	20	No complaints
36	1/10	2/10	125/64	96	20	No complaints
48	1/10	2/10	120/60	76	20	No complaints

## Discussion

Total or simple mastectomy is an oncological surgical procedure for breast malignancy, namely by removing all breast tissue consisting of all of the stroma and parenchyma of the breast, areola and nipple, and skin overlying the tumor with sparing lymph nodes and pectoral muscles. In this patient, a bilateral breast lift was performed where the pain intensity in the postoperative condition of this patient can take place with a moderate to the severe pain scale. The correct selection of drugs and drug administration techniques determine the success of postoperative pain management.

Multimodal analgesia, which combines the administration of analgesics from various regimens of analgesic drugs with different mechanisms, aims to maximize the strength of analgesia at a lower dose to minimize possible side effects.<sup>14</sup> In this case report, subanesthetic



doses of ketamine (analgesia) were given at a bolus dose of 0.15 mg/KgBB immediately after the patient was in the recovery room and followed by ketamine 0.1 mg/kgBW/hour via a syringe pump. The results obtained were quite good, with minimal complaints of side effects, but they had a significant analgesic effect as a substitute for the use of postoperative opioids.

Ketamine is known as an NMDA receptor antagonist preventing central sensitization of pain receptors and reducing the effect of central sensitization that has already been formed.<sup>15</sup> Ketamine is widely used to treat pain in emergency situations in and out of the hospital, in disaster situations, and during patient transport and transfer. It is also commonly used to treat pain during procedures, including dressing changes (for burns, plastic surgery, stitches) and fracture reduction. In some conditions, the dose may be given in increments of 10-20 mg or less in the elderly. Giving a benzodiazepine class such as midazolam may be useful to reduce the incidence of psychotomimetic side effects.

### **Conclusion**

The use of ketamine in postoperative bilateral mastectomy can reduce pain intensity and have minimal side effects.

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