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Peri anaesthesia management in appendectomy with regional anaesthesia subarachnoid block in appendicitis and leucocytosis

Kevin Virirey Mondawitu[1*], *M. Ka'bil* Mubarrak[1], *The* Ayodhya Santam Budjana[1], *Rahmaya* Nova Handayani[1] and *Made* Suandika[2]

[1]Department of Anaesthesia, Faculty of Health, Harapan Bangsa University, Indonesia
[2]The Graduate Institute of Clinical Medicine Science, College of Medicine, Chang Gung University, Taoyuan, Taiwan

Abstract. The prevalence of surgery in cases of appendicitis is one of the most common diseases in the world and is the most common disease affecting children and adults. Therefore, anaesthesiologists are often faced with perioperative measures in appendectomy patients. With the action of peri anaesthesia on preventing the increase in infection due to leucocytosis and adjusting the anaesthetic agent drugs given so that the operation given can be successful without adverse effects on the patient. In this case we describe the peri anaesthesia related to Appendicitis surgery with Laparotomy Appendectomy technique with the management of Leucocytosis and Bleeding in peri anaesthesia management. The research method used in this research is Case Study. Post-operatively, the patient is monitored in the Recovery Room. Bromage Score 0 indicates the patient is ready to be transferred to the ward. Appendectomy for appendicitis uses spinal anaesthesia with fentanyl, antibiotic prophylaxis, and bleeding monitoring, achieved Bromage Score 0, and was then transferred to the ward, ending the researcher's role as anaesthesiologist.

1 Introduction

Appendicitis is a very common disease found in many countries around the world and is also a disease that must be treated immediately because it can cause high morbidity and mortality if left untreated. Although the disease is gender- and age-independent, it is most common in children and young adults (1). Appendectomy is a medical procedure or action that involves the appendix (2).

According to data taken from the World Health Organization (WHO), the incidence of appendicitis in 2010 reached 21,000 patients. The highest incidence can be found in Europe, which is around 16%, America as much as 7%, Asia 4.8% and Africa 2.6% of the total population. Then data taken from the Ministry of Health of the Republic of Indonesia (KEMENKES), the prevalence of appendicitis in Indonesia reached 67,755 cases and in 2017 reached 75,601, making Indonesia occupy the 4th position in 2018

* Corresponding author: kevinvirirey177@gmail.com

with 28,040 appendicitis patients hospitalized. From these data, it can be seen that the number of appendicitis patients continues to increase every year (3). From the results of previous studies such as those written by Echevarria† Sophia, et al (2023) said that the tendency of appendicitis occurred in all age categories which was slightly more common in men (4).

Common symptoms that usually arise in patients with appendicitis begin with pain in the lower abdominal area of the dextra. Patients will also feel significant pain when coughing and walking. In addition, patients may also experience anorexia, nausea and vomiting, diarrhoea, and the frequency of urination becomes smaller (5). This is also explained again and conveyed by (I, Kartal 2020) which states that patients with appendicitis can have more than one sign and symptom of the disease including abdominal pain, diarrhea, nausea vomiting and fever (6).

Appendectomy is indicated in patients who have acute appendicitis, as stated by W. Chaochankit et al. (2022), who stated that appendectomy is a standard action in the management of acute appendicitis (7). This statement is also supported by M. Krzyzak and S. Mulrooney (2020), who said that the initial treatment of appendicitis is focused on surgery (8). Contraindications in patients with appendicitis are patients who have a history of systemic disease, such as severe cardiopulmonary disease, as stated by Ritvik Resutra and Rajive Gupta (2020) (9). This statement was reinforced by M. Shaikh et al. (2019), who stated that contraindications for laparotomy appendectomy surgery include patients with a history of severe cardiac or pulmonary disease, cirrhosis, and coagulation disorders (10).

This case report outlines the anesthesiology nursing care provided to appendicitis patients undergoing appendectomy at Ungaran Regional General Hospital. The anesthesiologist holds primary responsibility for pharmacological therapy and patient safety management. A multidisciplinary team, including anesthesiologists, surgeons, circulating and instrument nurses, radiologists, lab personnel, nutritionists, and other specialists, collaborates to ensure comprehensive perioperative care. This approach aims to enhance patient recovery, with ongoing monitoring and follow-up care supported by various professionals, including surgeons (11).

2 Method

The method used in this research is Case Study, which is a research method conducted to study in depth a particular case in the context of its life. Case studies allow researchers to explore and analyze in detail the specific aspects of the subject under study. The population studied in this case is a 23-year-old patient with a diagnosis of Appendicitis who will undergo appendectomy surgery with Regional Spinal Anesthesia technique. In this study, researchers used several instruments in obtaining data as supporting data in physical examinations such as the AMPLE examination (Allergy, Medication, Past Illness, Last Meal, Environment. Then the 6B examination (Breathing, Blood, Brain, Bladder, Bowel, Bone), then determine the patient's ASA status, and use the Bromage Score assessment.

Data collection techniques used in this study were direct observation and subjective patient interviews during perianesthesiology. This research was conducted on July 20, 2024. This research was supported by the ethical approval issued by Harapan Bangsa University with code No.B.LPPM-UHB-232/02/2024. Data were analyzed based on observations of patients undergoing interventions during the perioperative period. This observation aims to evaluate the patient's response to the implementation

provided, so as to obtain a thorough understanding of the effectiveness of the perioperative measures implemented.

3 Case History

A 23-year-old man weighing 61 kg and 166 cm tall, so that it can be determined for Body Mass Index (BMI) is 22.1 kg / m2 (normal category) came to the hospital with complaints of pain in the right lower abdomen that felt like stabbing. Upon arrival at the hospital after a hemodynamic examination was obtained within normal limits. With a history of smoking and an indication of leucocytosis, with an American Society of Anaesthesiologist (ASA) II assessment.

At the time of the Allergic, Medication, Past Illness and Environment (AMPLE) examination, the patient was within normal limits, there was only one that was not within normal limits, namely in the environment where the patient had a history of smoking. Then on the assessment of Breathing, Blood, Brain, Bladder, Bowel, Bone 6B on there is a disturbance in the Bowel section where the patient has inflammation in the digestive system, namely in the appendix.

At the focus of the physical examination of the abdomen when palpation is carried out, the patient says tenderness and feels like being stabbed. From the results of observations, the patient looks grimacing in pain, and looks avoiding the lower abdomen dextra area when palpated. When examining the pain scale using the Numeric Rating Scale (NRS) the patient said the pain scale he felt was at number 7 which indicated that the patient was experiencing severe pain. Then in the laboratory results it is also known that there is Leucocytosis (20.79) as found in (Table 1).

Table 1. Laboratory Results.

Examinations	Results
Leukocyte	20.79 10^3uL
Thrombocyte	630 10^uL
Neutrophil	83.1 %
Lymphocyte	9.0 %
Natrium	130.9 mmol/L
Chloride	96.4 mmol/L

Then the preoperative evaluation of the patient was given crystalloid Asering with 20 drops per minute (dpm) to meet fluid needs during the preoperative period the patient had been fed for 6 hours. Then the patient entered the Central Surgical Installation at 10.30 and was given premedication drugs, namely Ondansetron injection 4 mg and Midazolam 2 mg Intra Venous (IV). The patient was given premedication prophylactic antibiotic ceftriaxone 1 g per 12 hours IV, then ranitidine 50 mg IV, ketorolac 30 g / 12 hours IV, and PCT 3 x 500 g tablets. When in the IBS room the patient has an IV infusion installed in the distal manus sinistra with an abocath size of 20 G. and then paired with a hemodynamic monitoring device and given oxygen with a nasal

cannula, in order to monitor the patient's hemodynamic and maintain the patient's breathing. Seeing from the results of the assessment above, Anaesthesia Health Problems (AHP) Anxiety and Anaesthesia Injury Risk appeared. Where in AHP Anxiety and interventions are carried out by monitoring Vital Sign, creating a therapeutic atmosphere that aims to reduce the patient's anxiety, and non-pharmacological techniques by teaching deep breath relaxation techniques, educating patients about the procedures to be performed and also given pharmacological drugs, namely midazolam 2 mg IV. Then in AHP Risk Anaesthesia Injury, the interventions carried out are by monitoring vital signs, assessing the patient's readiness before surgery such as fasting, and smooth iv lines by ensuring that crystalloid fluid is still flowing, and preparing instruments and drugs according to the type of regional anaesthesia to be given.

In the Intraoperative stage, the patient was considered using Regional Anaesthesia with Spinal Anaesthesia technique with the injection location at the paramedian Lumbar 3 - Lumbar 4 with spinocain 25 G. The drugs used at the time of spinal administration were Fentanyl 25 mcg and Lidocaine HCl 50 mg / ml + Dextrose 5%. However, after observation, it turned out that the patient still felt a sensation of pain when stimulated, so it was given again using spinal anaesthesia technique with Bupivacaine Hydrochloride 5 mg and Fentanyl 25 mcg. In the first 20 minutes there was a decrease in blood pressure to 99/78 mmHg then ephedrine was given as much as 15 mg intravenously IV with monitoring of blood pressure and MAP in the next 5 minutes. On the other hand, the patient also experienced massive intraoperative bleeding so that tranexamic acid 500 mg was instructed intra-venously. At 25 minutes of vital sign monitoring, there was no significant increase in blood pressure so that colloidal fluid titration (HEST) was reconstituted. In the results of the above assessment, AHP Risk Cardiovascular Function Disorders and Risk bleeding appear, where the interventions provided are monitoring signs and symptoms of decreased cardiac output, monitoring the status of fluids given, ensuring IV flow is functioning properly, and positioning the patient in a supine position. Risk bleeding interventions performed are colloidal fluid therapy HEST 20 dpm, and intravenous (IV) administration of Tranexamic Acid 500 mg.

At the time of postoperative patient, the patient finished the operation at 11:30 assessment at postoperative obtained BP 122/70, HR 65 x/min, RR 20 x/min and SpO2 97%. From the evaluation of bromage score 2 so that the patient is recommended to be treated in the Recovery Room by giving postoperative analgetic drugs with Ketorolac, Ranitidine, and Fentanyl dripped on futrolit with 20 dpm. In the last assessment, it can be concluded that the patient's AHP during post-anaesthesia is at risk of falling. In this assessment, interventions were carried out such as identifying risk factors for falling patients caused by the anaesthetic agents used, identifying pain or other physical complaints that are at risk of causing falls, then monitoring the patient's vital signs, and finally installing a safety bed trail.

Then postoperative handling, the patient was transferred to the Recovery Room with hemodynamic monitoring and Bromage Score assessment while in the Recovery Room, and the patient was given postoperative analgesic. After the Bromage Score assessment was obtained, the score was 0, so the patient could be transferred back to the ward and the task of the researcher ended when the patient was handed over to the room nurse.

4 Discussion

In this patient, it was found that the laboratory results said that there was an increase in leukocytes which stated that this patient had an infection caused by his appendix, as

stated by M. Bilal, et al (2021) who said that an increase in the number of leukocytes can be data that supports the diagnosis of appendicitis (12). In another study presented by A. Ribeiro et al. (2022), some authors learned that through leukocyte examination, the severity of appendicitis can be distinguished based on certain leukocyte values (13). In the handling of appendicitis itself, where leucocytosis in this case was given ceftriaxone at a dose of 1g / 12 hours which is where the statement is in line with I. Planas Diaz, et al (2024) where the use of Cefuroxime was replaced with Ceftriaxone in the procedure for handling infection in appendicitis (14). Research conducted by M. Cagri Goktekin (2020) also states that the administration of Ceftriaxone at a dose of 1 g IV is the dose used to treat increased infection in appendicitis (15).

At the time of premedication, the patient was given midazolam at a dose of 1 mg because the patient experienced anxiety which caused the patient's hemodynamic to be disturbed after administering 1 mg of midazolam, the patient immediately looked calm and hemodynamic stabilized, this action is also supported by the statement of Ali S, et al (2019) which says that the administration of midazolam drugs accompanied by communication while holding the patient's hand is very effective in reducing anxiety (16). Another study conducted by Bromfalk, Åsa Myrberg, et al. (2021) states that premedication with midazolam provides a more effective effect and produces significant anxiolysis (17).

Then during intra-anaesthesia after being given spinal anaesthesia drugs using fentanyl and Lidocaine HCl 50 mg / ml + Dextrose 5% the patient still felt a sensation of pain when given a stimulus so the patient was given back spinal anaesthesia drugs using Bupivacaine Hydrochloride 5 mg and fentanyl 25 mcg, and after being given the drug the patient began to lose the sensation of pain after being given a stimulus, this is in line with research from Z. Jin, et al (2021) who said that the use of Bupivacaine provides a longer anesthetic effect compared to the use of other local anesthetic drugs (18). In another study researched by B. Schneider (2022) there is also a statement that says that Bupivacaine is used as a substitute for Lidocaine (19).

Then at the time of intraoperative the patient also experienced massive bleeding where the patient was given the drug Tranexamic Acid 500 mg Intravenously which action is also supported by a statement from Shirasu D, et al (2023) which says that the use of tranexamic acid can reduce bleeding during intraoperative. The mechanism of tranexamic acid causes a haemostatic effect caused by venous bleeding (20). The use of the drug Tranexamic Acid is also supported by research by A. Koh (2021), which states that Tranexamic Acid is very helpful in reducing bleeding, so it can reduce the proportion of patients who need blood transfusions (21).

This study explains how an anesthesiologist chooses the method and technique of anesthesia to be given, then also conveys how the selection of drugs is in accordance with the patient's condition when undergoing the perioperative stage. This study aims to illustrate how the task of an anesthesiologist performs actions in collaboration with medical personnel during the perioperative period of patients with appendicitis undergoing appendectomy surgery with regional anesthesia.

5 Conclusion

Appendectomy is the main choice for the treatment of acute and chronic appendicitis with varied anaesthetic considerations, the combination of induction of spinal anaesthesia from the anti-pain group of fentanyl in certain situations is very necessary to inhibit pain sensation and facilitate intraoperative operations. The administration of

antibiotics with the aim of prophylaxis in preventing the spread of deeper infection is highly recommended. On the other hand, monitoring intra- and postoperative bleeding is a factor in the success of treatment. After surgery, the patient was transferred to the Recovery Room for hemodynamic monitoring, Bromage Score assessment, and analgesic administration. With a Bromage Score of 0, the patient was ready to be transferred to the ward, ending the researcher's duties as an anesthesiologist as the patient was handed over to the ward nurse.

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