International Conference on Health and Biological Science
ICHBS, Page 361-367, December 2024

General anesthesia using endhotracheal tube in craniotomy patients: case reports

Rizki Illahi[1*], *Made* Suandika[1], and *Arni* Nur Rahmawati[1]

[1]Applied Nursing Anesthesiology Study Program, Faculty of Health, Harapan Bangsa University

Abstract. A craniotomy is a surgical procedure that involves opening the bones of the skull to provide direct access to the brain. The procedure is performed on patients with conditions such as brain tumors, brain hemorrhages, cerebral abscesses, brain infections, and brain ttrauma. In this case, a 75-year-old patient suffered a brain hemorrhage due to a tear in the vein of the bridge that connects the cerebral cortex and the venous sinuses where the venous veins originate. The best anesthesia technique used is general anesthesia with an endhotracheal tube (ETT), which aims to keep the airway safe during the surgical procedure. Previous studies have shown that the choice of general anesthesia methods is to be maintained because it can affect the clinical outcome of the patient. In addition, proper management of anesthesia can play an important role in supporting the craniotomy procedure. This abstract highlight the importance of proper management of anesthesia in supporting the success of caniotomy.

1 Introduction

Craniotomy is a surgical opening of the skull to improve access to intracranial structures. This operation is carried out to remove tumors, reduce ICT, evaluate blood clots and control hemorrhage (1). There are two types of head injuries, namely open and closed, for those that are open, the causes are such as penetrating through the dura meter (bullets, knives), while for self-closed ones such as blunt trauma (traffic accidents, injuries during sports) (2). These injuries can be classified as follows, among others, acute to acute occurs within 24 hours to 48 hours during the injury, subacute occurs within 48 hours to 2 weeks, while chronic usually occurs after a few weeks or months from the occurrence of the injury (3).

Bleeding caused by veins, usually the blood collected is only 100-200 cc and stops due to the hematomic tamponade itself. After 5-7 days the hematoma begins to reorganize which will be completed in 10-20 days. The absorbed blood leaves the tissue rich in blood vessels so that it can trigger small bleeding again and form a subdural sac filled with fluid and over time will bubble up giving symptoms like a cerebellar tumor due to gradually increasing intracranial pressure (4). One of the important aspects of performing surgery in this case is the role of the anesthesiologist. The anesthesia technique is carried out using the

*Corresponding author: rizkiilahiii80@gmail.com

Endhotracheal tube general anesthesia technique, an anesthesia technique that focuses on the patient's optimal position to prevent airway complications during the anesthesia process and minimize the risk of respiratory complications, especially in patients with airway disorders and reduced consciousness such as craniotomy.

2 Research methods

This research method uses a special report approach (case report) to analyze the treatment of chronic subdural hematoma through craniotomy procedures. Patient data was obtained from medical records at Kardinah Tegal Hospital, and involved direct monitoring during the operation process. The subject of the study was a 75-year-old man with a medical diagnosis of chronic subdural hematoma FTP Dextra who was planned to undergo craniootomy.

The patient experienced a decrease in consciousness for approximately six days. Have a history of cardiovascular (hypertension, stroke, and heart disease). Examination and laboratory results that support the indication of craniotomy. In this case, the author directly monitors the operation as it progresses. Data collection is taken from the patient's medical records, laboratory examinations, and records during the operation procedure. The data were analyzed descriptively to describe the implementation of caniotomy as a treatment of chronic subdural hematoma and to evaluate the effectiveness of the anesthesia technique performed.

3 Case

3.1 Clinical history and examination

A 75-year-old man came to Kardinah Tegal Hospital with the main complaint of decreased consciousness for 6 days in the hospital, stiff legs and hands have been for a long time, the patient can only lie down since he was at home. In the AMPLE examination, Allergies (-), Medidioin for hypertension drugs and heart drugs (not studied in depth because the patient is somnolen), Past illness the patient has a history of stroke, heart, and hypertension, for the history of previous operations (-), Last meal of last oral intake or fasting of milk for 6 hours, Environmrnts the patient has the habit of drinking 3 cups of coffee a day and smoking 10-16 cigarettes/day quitting since illness. LEMON patients are already pale and have a mallapati score of 2, for CRT<2 derek, for limited mobility (unable to move), for mobility itself looks limited by being marked as unable to move. Based on the anamnesa, the physical examination of the patient was diagnosed with Subdural Chronic Hemtoma FTP Dextra with a plan of craniotomy measures.

3.2 Laboratory examination

Table 1. Laboratory Examination Results

Examination		Result	Unit	Reference Value
HAEMATOLOGY				
Hemoglobin	**L**	**10.9**	g/dL	11.0 – 15.0
Leuokosit	**H**	**12.39**	10^3uL	4.0 – 10.0

Hematocrit	**L**	**31,3**	%	37.0 – 47.0
Platelet	**L**	**78**	10^3uL	150 – 300
Red blood cell	**L**	**3.37**	10^6uL	3.5 – 5.0
RDW		13.5	%	11.0 – 16.0
MCV		93.0	fL	80.0 – 100.0
MCH		32.5	Pg	27.0 – 34.0
MCHC		34.9	g/dL	32.0 – 36.0
Diff				
Neutrofil %	**H**	**80.7**	%	50.0-70.0
Lymphocytes %	**L**	**10.0**	%	20.0 – 70.0
Monosit %		6.5	%	3.0 – 12.0
Eosinofil %		2.7	%	0.5 – 5.0
Eosophil %		0.1	%	0.0 – 0.1
Lymphocytes #		1.24	10^6uL	0.80 – 4.00
Neutrofil #	**H**	**10.01**	10^6uL	2.00 – 7.00
NLR	**H**	**8.07**		<3.13
HEMOSTATIS				
PT	**L**	**8.8**	Second	9.8-15
APTT		28.2	Second	23.9-34.9
INR		0.81		0.8 – 1.2
CLINICAL CHEMISTRY				
Albumin	**L**	**2.59**	Mg/dL	3.50 – 5.20
SGOT	**H**	**45**	U/L	< 40
SGPT		32.8	U/L	< 41
Urea		0.37	Mg/dL	19.0 – 44.0
Creatinin			Mg/dL	0.70 – 1.30
ELECTROLYTE				
Sodium		136.9	Mmol/l	135-145
Potassium		4.35	Mmol/l	3.3 – 5.1
Chlorida	**H**	**107.1**	Mmol/l	96 -106
IMUNOLOGI				
HIV Rapid 1		Non-reactive		Non-reactive

SEROLOGY				
Qualitative HBsAg		Negative		Negative

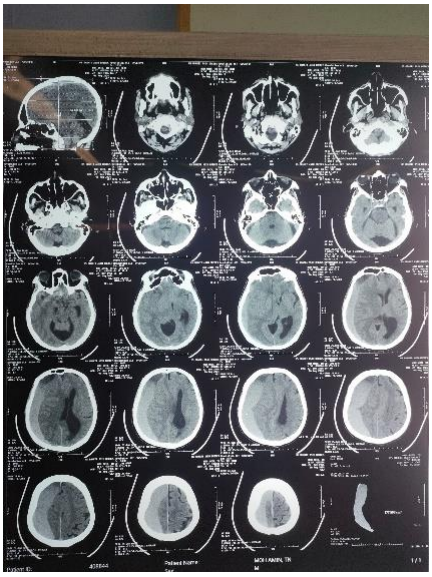

Fig. 1. Rontgen Photo

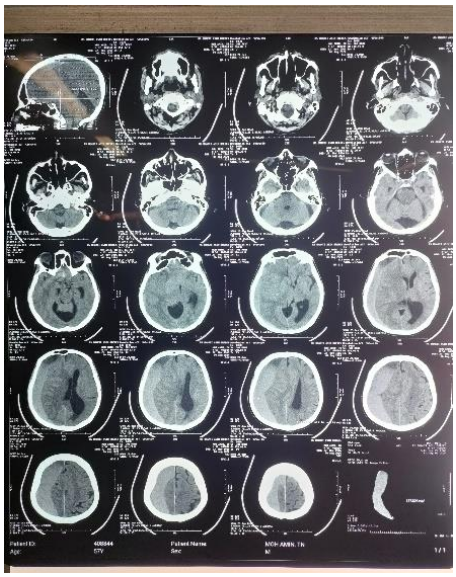

Fig. 2. Rontgen Photo

In the operation majrment, 8mg of ondansentron was administered. And then the induction of propofol is carried out as much as 200 mg, fentanyl 100 mcg, Rocyronium as much as 30

mg, in addition to that for other maintenance it is balanced by giving sevoflurane 2 cc, then given RL 1500 cc, and also tranexamic acid 1 g. Pre-operative evaluation showed hemodynamic status of blood pressure 133/70 mmHg, HR72x/min, MAP 91 mmHg, RR 20x/min, temperature 36◦C.

In intra-anesthesia, vital signs are monitored, fluid therapy with smooth intravenous access using terastac, in this case the patient is given propofol 200mg, fentanly 100mcg, rocurorium 30mg, using endhotracheal tube number 7.5. After that the patient was surgically performed, during the surgery special attention was paid especially to the patient's airway, the procedure took place and a 500cc terastac search was loaded, and the use of 2cc sevovluran was carried out, the patient was fitted with double IV, RL 500cc which had been dripped adona 100mg and Nacl, then the patient was given Tranexamic Acid 1g, then given an additional fentanyl 100mcg and tramadol 100mg, with vital signs of 98/72mmhg, HR 72x/min, SPO2 100%. The operation lasts for 80 minutes from the time the patient comes to the operation room The patient's condition after the operation is unconscious so the doctor recommends the patient to go to the ICU for more monitoring.

Patients are recommended to go to the ICU room for further monitoring and under full monitoring by health workers, monitoring in the ICU includes the use of ventilators and strict monitoring of vital signs and neurological status because patients can experience potential complications such as the risk of postoperative seizures and accumulation of hematomas.

4 Discussion

A subdural hematoma is a collection of blood in the subdural cavity (between the durameter and the arachnoid). This bleeding often occurs due to the tearing of the veins of the bridge located between the cerebral cortex and the venous sinus where the veins gather, but it can also occur due to lacerations of arterial vessels on the surface of the brain (5). This bleeding often also covers the entire surface of the brain's hemisphere and brain damage (6).

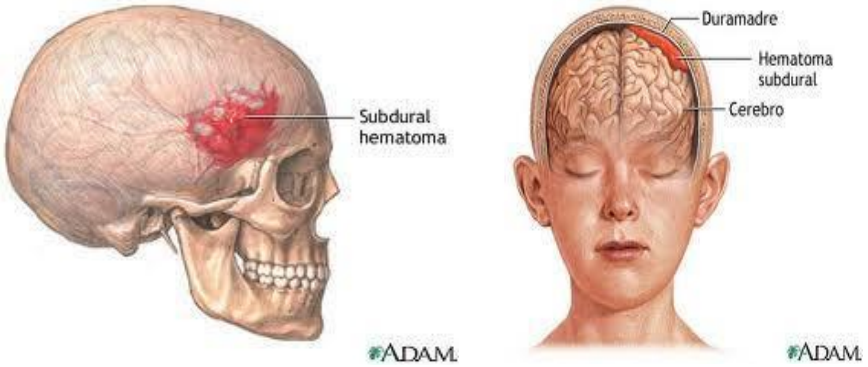

Fig. 3. Subdural hematoma (boards.medscape.com and stonybrookphysician.adam.com)

This bleeding is caused because venous bleeding is usually only 100-200 cc of blood collected and stops because of the hematona itself. The absorbed blood increases the rich tissue with blood vessels so that it can trigger small bleeding and form a subdural bag full of fluid and blood residues. It is said to be acute if less than 6 days after the occurrence of the hematoma, this condition arises after the trauma/injury occurs (7). Subdural bleeding can occur in capathic trauma, capathic trauma is a ttrauma elsewhere in the body that results in a

friction or brain rotation of the durameter, for example in a person who falls and sits. In addition to capitis trauma, there is also non-trauma, the meaning of non-trauma itself is blood clotting disorders usually related to spontaneous subdural bleeding, and malignancy or bleeding from intracranial tumors, usually occurs in the elderly, people who often consume alcohol, liver disorders, and people who experience the use of anticoagulants (8).

This bleeding will give the classic symptoms of monoparesis of the lower limbs. This case is often found in young children because of the severe shock experienced by children at the height (*shaken baby syndrome).* The result of this bleeding can lead to increased changes in brain shape in humans (9). There are two theories that explain the process of chronic subdural hemorrhage, including Gardner's theory where the theory says that part of the theory that the blood will melt so that it will increase the protein content contained in the subdural hematoma and will cause an increase in pressure in the subdural hematoma capsule. The second theory says that repeated bleeding can cause subdural hematoma bleeding (6).

5 Conclusion

A 70-year-old male patient with a diagnosis of chronic subdural hematoma FTP dexttra. Craniotomy surgery with general anesthesia using endhotracheal tube will be performed because it is more effective than other anesthesia techniques, so that the patient's airway is not disturbed when the surgical process is carried out on the patient's head. Therefore, craniotomy is a very appropriate operation for diagnosing subdural hematomas, but it must also be accompanied by fluid loading to be full for bleeding that occurs during surgery.

Reference

1. Moro M. Surg-14. Awake Craniotomy Vs Craniotomy Under General Anesthesia for Glioblastomas: Evaluating the Impact on Overall Survival and Risk of Recurrence. Neuro-Oncology. 2020;22(Supplement_2).
2. Kandou Rd, Periode M, 2016 -Juni J, Tanriono C, Lalenoh Dc, Laihad Ml, Et Al. Profil Pasien Pasca Kraniotomi di Icu Rsup Prof.
3. Definisi-Dan-Etiologi-Kraniotomi_Compress.
4. Kritis K, Pengampu D, Prasetyani D, Kep M, Oleh D. Makalah Kraniotomi Diajukan Untuk Memenuhi Tugas Mata Kuliah.
5. Siregar As, Rr Sinta Irina, Lubis Ap. Perbandingan Nilai Inferior Vena Cava Distensibility Index Sebelum Dan Sesudah Pembedahan Kraniotomi Pengangkatan Tumor Otak. Majalah Anestesia & Critical Care. 2024;42(2):125–34.
6. Sastrodiningrat Ag. Memahami Fakta-Fakta Pada Perdarahan Subdural Akut. Universitas Stuttgart. 2021;39(3).
7. Subdural-Hematoma_Compress (2).
8. Januarman, Arifin Parenrengi M. Calcified Chronic Subdural Hematoma in Two Young Men: Two Cases In Dr. Soetomo General Academic Hospital Indonesia. Interdisciplinary Neurosurgery: Advanced Techniques and Case Management. 2021;25(February):101171.

9. Miah Ip, Tank Y, Rosendaal Fr, Peul Wc, Dammers R, Lingsma Hf, Et Al. Correction To: Radiological Prognostic Factors of Chronic Subdural Hematoma Recurrence: A Systematic Review and Meta-Analysis (Neuroradiology, (2021), 63, 1, (27-40), 10.1007/S00234-020-02558-X). Neuroradiology. 2021;63(1):159–60.