Original Article: The Most Common Site of Postoperative Bleeding

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ABSTRACT

The lateral branches are bypass grafts that run along the chest wall and are the beginning of where the right or left internal mammary arteries connect to the LAD artery to restore blood flow. Patients undergoing CPB surgery are more likely to bleed than patients undergoing Off Eump surgery. Also, lowering the body temperature for a while leads to a decrease in platelet function. Preoperative evaluations, including platelet count and function, correct hematocrit that determines blood volume, reduce the risks and complications of intraoperative and postoperative bleeding. Heart surgery patients should be routinely treated for coagulation disorders, hereditary, hemophilia, and von Willer's disease, and acquired infections such as lupus and lymphocytic leukemia, and recent use of OTC medications such as aspirin and ibuprofen, and dietary alternatives such as Vit E, Ginseng, and garlic. Get information about anything that interferes with coagulation. Taking antithrombotic drugs, which play an important role in the prevention and treatment of cardiovascular disease, can lead to bleeding. Such as the anticoagulants heparin, Lepirudin, and antiplatelet drugs such as aspirin, clopidogrel, which protect platelets from thio. Patients receiving highly effective anticoagulants and requiring emergency surgery can be tested with the high-sensitivity p2y12 test. This test shows that some people may be ready for surgery in as little as 1 to 2 days. Patients undergoing elective surgery should discontinue high-dose antiplatelet drugs such as glupidergrol for at least 5 to 7 days and low-potency drugs such as aspirin 1 to 3 days before surgery to reduce the risk of bleeding. Patients taking warfarin should stop taking it at least 5 days before surgery. Some may need vitamin K or a combination with FFP to counteract the effects of warfarin. This process can generally take between 6 and 8 hours.

Introduction

A group that inhibits coagulation factors in the liver [1-3]. Such as warfarin and clusters that interfere with blood clotting by inhibiting thrombin activity [4-6]. Monitor the patient's hemoglobin, blood pressure [7-9], and urinary output at the same time as you check the drainage of the chest tubes and the heart outlet [10-12]. Any decrease in one or more can be a sign of internal bleeding. If bleeding is suspected, hematocrit and drainage collected through the fallopian tubes can be measured directly [13-15]. If the drainage

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suddenly decreases or stops and does not continue as the patient's position changes, there may be a problem with a clot in the papillary breast tubes [16-18]. Never suck the clots in the chest tubes, as the negative pressure can cause bleeding. Instead, gently massage the clots to prevent clogging of the breast tubes [19-21]. Clots in the pericardium can cause blood clots and cardiac tamponade to build up. Perform CXRay if heart sounds decrease, venous pressure and pulmonary artery wedge pressure decrease, urinary output decreases and cardiac index decreases, especially if there is a paradoxical pulse [22-25].

Medication for at-risk patients

The first step in controlling exessive bleeding with a suspected cause of coagulopathy is to give FFP [26-28]. Then, depending on blood pressure, hematocrit, surgical complexity, and other laboratory results, the patient may need additional transfusions or hematostatic drugs with antifibrinolytics [29-31]. Antifibrinolytics such as aminocaproic acid, tranexamic acid, and aprotinin prevent bleeding by stopping the breakdown of fibrin. Hematostatics, like Vit K, counteract the effects of warfarin and prevent capillary bleeding. For the past 14 years, the broadest range of drugs to stop bleeding in patients at very high risk has been maprotinin, which has been approved by the FDA [32-35]. However, the organization stopped buying and selling it for a while in 2007 due to a report from a Canadian study on the increased risk of kidney failure, MI, heart failure, stroke and death. As clot formation progresses, antifibrinolytic drugs lead to serious situations such as stroke, heart attack, deep vein thrombosis, and pulmonary embolism [36-38].

Examine patients for sudden onset of these symptoms: Shortness of breath and chest and groin or leg pain and speech problems, vision changes, weakness in the arms and legs, or reduction, among other medications that are effective. Recombinant activated factor is used to treat bleeding in hemophilia patients. Studies on the use of desmopressin DDAYP, which builds plasma levels of factor VII [39-41], show that it is effective in reducing bleeding during open heart surgery. Erythropoietin is also useful for non-cardiac patients with preoperative anemia. The time required for the effect of this drug is 4 to 6 days. Therefore [42-45], it is not used in patients who need emergency surgery. In Europe, 4-5 solutions are widely used to increase blood volume in patients with extensive bleeding following cardiac surgery. The problem with these solutions is their ability to clot at high doses [46-48]. Studies in New York have shown that patients who are hemodynamically unstable are more likely to die within the first 30 days of open heart surgery than patients with similar hemodynamic stability [48-50].

The following six variables, accepted by the Society of Thoracic Surgeons and Cardiovascular Anesthesiologists, are important indicators for patients who require a blood transfusion after surgery:

- ✓ Old age, especially over 70 years.
- ✓ Low preoperative RBC volume due to anemia or small body [51].
- ✓ Preoperative treatment with antiplatelet drugs such as clopidogrel or anticoagulants such as warfarin [52].
- ✓ Complex procedures or re-surgery.
- ✓ Emergency surgery [53].
- ✓ Non-cardiac comorbidities such as diabetes, renal insufficiency or liver failure [54].

Other risk factors for bleeding include coagulopathy or inherited platelet failure such as hemophilia B or A, and Von wille brand disease. Acquired or autoimmune platelet coagulopathy includes chronic lymphocytic leukemia [55-57], cirrhosis, or lupus. Perpheral vascular disease. Prolonged cardiovascular bypass requires a blood transfusion when the patient is on CPB [58-60]. The use of intra-

mammary arteries for transplantation, low body temperature in transfusion use in a limited way to limit the risks associated with blood transfusion in patients who have elective surgery and are healthy enough to donate their own blood are encouraged [61-63]. Also, during surgery in CABG patients, blood from the mediastinum cavities is routinely re-injected into the patient in order to use less donated blood. RBC recovery during surgery using a cell-saving device to help keep blood in cardiovascular surgery using cardiovascular bypass is helpful [64-66]. Delirium is defined as an acute change in the patient's cognition and attention that fluctuates throughout the day. It should be noted that delirium is different from dementia [67-69]. Distinctive symptoms of delirium include an acute onset of fluctuations in consciousness throughout the day, disturbances in consciousness and attention, and changes in sleep cycles [70-72]. Delirium is often referred to as acute confusion and has a variety of clinical forms, including hyperactive or disturbed delirium, which accounts for 25% of all cases, hypoactive delirium, which is less well known or not properly treated [73-75]. The third form is the delirium complex. Common signs and symptoms of delirium include memory impairment, cognitive impairment, irregular speech, hallucinations, and delirium [76-78].

Predisposing factors

A. Occurrence of delirium after coronary artery bypass graft surgery: The exact mechanism involved in the development and progression of delirium is unknown [79-81]. In general, a multifactorial framework has been defined for delirium after cardiac surgery, which includes predisposing factors, exacerbating factors, accelerating factors, predisposing factors that are the same as preoperative variables: age over 65, gender (More men than women) [82-85], education, marriage, body mass index, living conditions, racial group, sensory impairment, history of smoking (at least 20 cigarettes per day for 2 months) [86-88], history of psychotic disorders (depression, acute delirium schizophrenia) Drug addiction, withdrawal of alcohol or sedative hypotension during a previous substance, history of physical illnesses (hypertension, diabetes mellitus, stroke, peripheral vascular disease, lung and kidney disease), discharge fraction less than 30% in the left ventricle and Atrial fibrillation and level of consciousness less than or equal to 8 and cardiogenic shock, emergency heart surgery and long waiting time for surgery [89-91].

Aggravating factors

Includes variables during surgery, including:
Type of surgery, emergency surgery, total time of vascular bypass, number of distal anastomoses [92-95], time to stop blood flow, time of ischemia, blood transfusion of more than 1 liter during surgery, hypothermia during surgery (temperature less than 3 degrees) and anesthesia in cases of reconstructive surgery The aorta is also implanted, increasing the chances of delirium occurring [96-98].

Accelerating factors

Postoperative variables involved in delirium include:
Days in intensive care unit, sensory stimulation, use of physical restraint, use of urinary catheter, prolonged sleep deprivation, pain, emotional stress, discharge fraction less than 30% in left ventricle, atrial fibrillation [99-101], postoperative cardiogenic shock and red blood cell transfusion of more than 1 liter, blood loss of more than 1 liter and hypoalbuminemia (serum albumin less than 3 grams per deciliter), acute infection, fever, hematocrit less than 30%, hypoxemia (arterial oxygen saturation less than 90%), serum creatinine more than 2 mg / dL and total bilirubin more than 2 mg / dL low or high sodium levels and hypoxia or hypercarbia, dehydration [102-105].

Diagnosis of delirium

In general, delirium is unknown or misdiagnosed in 66-84% of patients because it has symptoms similar to depression and dementia. In addition, many members of the health team are unaware of its high incidence and its consequences and side effects. Knowing the mentioned risk factors will enable the members of the health team to prevent its occurrence [106-108] or to prevent complications and deaths due to timely diagnosis and providing a safe and calm environment for the patient. Nurses have a great role in diagnosing and recording the symptoms of delirium due to direct care of the patient. The DSM-IV criterion is used to diagnose delirium, but it has some problems [109-111]. Another method is the confusion method, which is mostly used in clinical conditions and its sensitivity and specificity is more than 95%. However, features 1 and 2 or 3 and 4 are essential.

- ✓ Acute change in mental state and oscillating periods.
- ✓ Lack of attention [112].
- ✓ Chaotic thinking.
- ✓ Change in level of consciousness.

Various studies have shown that defects in the diagnosis and control of delirium can lead to life-threatening complications, increase the length of hospital stay, require more nursing care at home, impair performance, require longer rehabilitation, and increase costs [113-115]. The incidence of this complication increases not only in coronary artery bypass graft surgeries and complex procedures and in the elderly, but also in long-term surgeries with high volume of blood transfusion in young people is not impossible. All members of the health team and the individual's family should be involved in controlling this problem [116-118]. In controlling delirium, all risk factors must be considered first. Identified the underlying diseases and treated them. Provided comfort to the patient and prevented the presence of family members in the patient's bedside and avoided the inappropriate and excessive use of sedatives.

Oxygen therapy

Oxygen therapy is the administration of oxygen at a higher concentration than is available in the environment [119-121].

Hypoxia

1- Types of hypoxia

Hypoxic hypoxia: Hypoxemic hypoxia is a decrease in the level of oxygen in the blood, which reduces the release of oxygen in the tissues. Such as atelectasis, hypoventilation and at high altitudes [122].

Hypoxia associated with stagnant circulation: is the result of insufficient blood supply to the capillaries. Such as decreased cardiac output and shock. If a sufficient volume of fluid is provided, the administration of painkillers and vasoconstrictors can be corrected [123].

Hypoxic anemia: is the result of a decrease in the concentration of effective hemoglobin.

Toxic hypoxemia: Occurs when a toxic substance such as cyanide interferes in tissues to obtain oxygen [124].

Hypoxia due to increased demand: This condition occurs when the bodies metabolic needs increase, such as severe burns or thyrotoxicosis [125].

The body's response to hypoxemia the response of the respiratory system:

The number and depth of respiration increases, followed by dyspnea, sweating, cyanosis, and respiratory distress using auxiliary muscles. All of these cases increase oxygen consumption, resulting in extreme fatigue and eventual

respiratory arrest, and oxygen therapy is needed for prevention [126].

Cardiovascular system response Hypoxemia Respiratory system response: Increased heart rate and output, increased blood pressure, arrhythmia, especially if the client has underlying problems such as heart failure, ischemia and heart attack. These increase oxygen consumption and cause irreparable damage. Oxygen therapy is needed [127].

Nervous system response Hypoxemia Respiratory response

Fatigue and drowsiness (chronic hypoxemia), restlessness and finally coma (acute hypoxemia).

Note: The most obvious symptoms in clients are disturbances of consciousness, restlessness and impaired judgment [128].

Note: Hypoxia If hypoxia at the cell surface leads to decreased tissue oxygenation, it should be called hypoxia. Hypoxemia is a decrease in the amount of oxygen in the arterial blood [129].

Oxygen administration methods (types of oxygen supply systems)

Oxygen supply systems are classified into two groups: low current and high current systems. We have low flow systems including the nasal tube, face mask and reservoir bag masks that have an oxygen tank for the patient [130]. When the patient's ventilation rate is less than the oxygen flow rate per minute, the oxygen tank is emptied and room air is used if the oxygen demand increases again. The final concentration of inhaled oxygen (Fio2) depends on the size of the oxygen tank, the rate at which the tank fills, and the patient's ventilation needs. Unlike low-current systems where FIO2 is variable and high-current systems, the FiO2 value is constant. In these systems, the amount of oxygen by the system is greater than the patient's maximum tail flow, or they use devices that inject a constant amount of room air into the system.

Note: Fio2 is constant in high current systems and variable in low current systems.

Methods of administering oxygen to nasal catheter (nasal canola)

A nasal catheter is used when the patient needs low to moderate concentrations of oxygen. This method is easy to use. Most patients tolerate it well. Oxygen delivery of more than 8-6 lit / min causes dryness of the mucosa. If more than 6lit / min is used, it does not significantly increase oxygenation. Because oxygen is stored in anatomical space with dead space. The main disadvantage of nasal cannula is its inability to provide high concentrations of oxygen in patients with severe ventilation needs. By increasing the oxygen flow from 1 to 6 liters, Fio2 increases from 24% to 46%. This relationship changes with changes in patient ventilation per minute.

Note: As ventilation increases per minute, additional ventilation is provided from the room air and FiO2 begins to decrease. A fourfold increase in ventilation per minute relative to the flow of oxygen through the nasal cannula reduces the FiO2 by 48%. Nasal catheters are used for patients with chronic airway obstruction. In patients with chronic pulmonary insufficiency, as they have chronic carbon dioxide retention, no more than 2-3 liters of oxygen per minute should be used, unless under ventilator. Because in these patients there is a possibility of apnea and respiratory arrest. When a nasal catheter is used in doses greater than 2 liters / min, it is necessary to use moist oxygen. When using the method, you should consider the skin of the face at the point of contact with the catheter for stimulation [131].

Prescribing guide

Examine the patient's nostrils with a flashlight. If the cannula is loose, pass it behind the ears and

under the ears, and place the hook firmly under the patient's chin if you use adhesive tape to secure the cannula. You can pass it over the ear and back of the head. Avoid tightening it. Because it puts pressure on the face and blocks the cannula. It is also possible to breathe through the mouth [132].

Throat oral catheter

It is another method that is rarely used, but it can be used in the short term [133].

Simple face mask

It is used for short-term and emergency treatment and provides oxygen to the patient with a concentration of 60-40%. The minimum prescribed oxygen rate is 5 liters per minute, which prevents the exhalation of exhaled air. You need to make sure that the mask is the right size for your face [134].

Reduces the incompatibility of the mask with the face of FiO2. Examine the facial skin for pressure from the mask. The mask restricts the patient from cleaning the mouth. Especially if the patient vomits, then the patient needs to be considered for aspiration. Patients who are afraid of closed space (phobia catheter) should be relaxed when using the mask. Consult a doctor to change the mask into a nasal catheter while eating.

Note: The oxygen flow rate must be adjusted to at least 5 liters per minute to remove carbon dioxide from the mask and to prevent re-breathing. Heat and confinement may damage the patient's skin. In order for oxygen to be given in higher concentrations, the mask must be exactly the size of the nose and mouth. For this reason, it may cause discomfort to the patient. Oxygen needs to be cut off when talking. Thus, its use for a long time is unbearable [135].

Prescribing guide

Choose the most appropriate face size mask. Put the mask on your nose, mouth and chin. For the lean or elderly patient with a sunken cheek, gas pads on the cheek and under the mask help to stabilize the mask on the cheek, but if the mask is not fixed and firm, the room air combines with oxygen. At least 5 liters per minute of oxygen is needed to prevent the patient from re-breathing carbon dioxide during exhalation [136].

Mask by re-inhaling part of the exhaled air

The patient breathes oxygen through a mask containing a bag containing atmospheric air and oxygen. A volume of return air enters the storage bag, because the air entering the stored bag comes from the chip and the bronchus, where gas exchange does not occur. The patient exhales oxygenated air again.

Note: In fact, the volume returned from dead space contains more oxygen and a small amount of CO2. Using this mask, the patient is able to inhale one third of the volume of exhaled air, which contains high oxygen. Thus Fio2 increases. When using this type of mask, make sure that the bag is not folded, as this will empty the mask. Adjust the oxygen flow rate so that the bag is always inflated. Otherwise the amount of oxygen will decrease. In order for the oxygen concentration to be accurate, the mask must be attached to the face, and this may cause discomfort to the patient and the patient should be cut off from oxygen while eating and talking. Heat and restraint may cause the patient to be free. There is a possibility of twisting and folding the bag. Cannot be used for long-term treatment. During inhalation, the air inside the bag should be reduced by more than a third. Otherwise, CO2 accumulates in the storage bag and causes a decrease in the percentage of oxygen inside the bag [137].

Mask without re-inhaling exhaled air

At the time of inhalation, the one-way tailpipe opens and is directed directly from the oxygen storage bag into the mask. When exhaling, the gases are expelled through a one-way exhalation

valve. This mask provides the highest concentration of oxygen at low speed. With this mask, the amount of FiO2 will be more than 90%, which of course will depend on the patient's breathing patterns. It is effective for short periods of treatment and the mucosa does not dry out. If necessary, by removing the one-way valve, it can be turned into a mask by re-inhaling part of the exhaled air. This type of mask is often used in patients who have poor respiratory status and are about to intubate. These masks have a one-way valve between the mask and the storage bag and two covers on the exhalation valves. This valve allows the client to receive all the oxygen from the storage chamber. Covers prevent room air from entering through the exhaust vents. FiO2 Delivery Rate, 95-100% for this FiO2 delivery rate, the storage bag must be full.

Note: Suffocation may occur if the storage bag is folded or disconnected from the oxygen source. See the airbag during the tail. The bag should not shrink beyond its capacity with each breath. Low air bag is a sign of insufficient airflow. Because this method requires complete fixation around the face. The Venture Mask delivers the most accurate amount of oxygen on demand. It mixes a certain volume of air and oxygen. Despite the patient's breathing pattern, oxygen is given to the patient at a high concentration and precisely at a constant flow. It works in such a way that for every liter of oxygen used, it absorbs specific and appropriate amounts of air and provides it to the patient. An adapter is located between the mask button and the oxygen source. The adapter has holes of different sizes. These holes allow oxygen to combine with the room air. The adapter selects the desired amount of oxygen [88].

Diluent jet or interchangeable interface

Interchangeable color adapters, each of which mixes a constant flow of oxygen with air and delivers it to the patient. Because it does not prevent the mucosa from drying out, an aerosol moisturizer can be used with it. If the mask is loose or the valve is blocked, there is not enough current, or the patient's breath changes oxygen concentration more than normal. Talking should be stopped while eating [138].

Face tent

This tent is located above the client's chin and covers more than half of the face. The oxygen concentration received will vary. This device has priority over tight masks in patients with facial trauma and burns. Aerosol mask is used in the following clients: Those who have discharge, clients need high humidity, after removing the tube with surgery on the upper airways [99].

Tracheostomy necklace

This necklace is used in patients who need oxygen with high humidity. These patients should also have a tracheostomy [45].

Tpiece

It is a device called a T-piece or Tolece. It is able to deliver the desired FiO2 to clients with endotracheal tube tracheostomy and laryngectomy. Leave the exhalation section open when using the T piece. Otherwise there will be a possibility of suffocation. Fix the T-piece so that it does not stretch the endotracheal tube or tracheostomy and does not scratch the skin. Continuous positive airway pressure mask this system allows the patient to breathe spontaneously by providing continuous positive airway pressure with or without artificial airways. The benefits of FRC increase non-invasively by increasing arterial oxygenation, preventing the patient from becoming infected. Gives the patient the opportunity to cough and talk without interrupting positive pressure. Monitor your respiratory status, blood flow, and gastrointestinal function every hour while using the mask. Complications may upset the patient because they must be perfectly sized. It becomes difficult to eat and talk; if the patient vomits, the

risk of aspiration increases. Decreased cardiac output, gastric distention, contraindicated in patients or COPD, decreased cardiac output, or compression pneumothorax [76].

Ambient bag ventilation (Ambo Bag)

An expandable device that attaches to the face mask or directly to an endotracheal tube or tracheostomy tube, giving the patient the opportunity to deliver oxygen or room air, which is unable to breathe on its own. Provide. Using oxygen with ambob helps to improve the flow of the cardiovascular system. It is usually used in emergencies when the patient is temporarily disconnected from the mechanical ventilator, during the transfer and replacement of the endotracheal tube, or before suctioning. In such cases, the use of a manual resuscitation bag causes ventilation. Except for patients who are intubated or have a tracheostomy, choose a suitable mask that covers the nose and mouth. Attach the mask to the resuscitation bag. Examine the patient's upper airways for foreign objects before using the manual resuscitation bag. Suction to remove discharge that may be obstructing. Replace an oral-pharyngeal or nasopharyngeal airway if necessary to maintain airway adequacy. Suction if the patient has a tracheostomy or endotracheal tube. Turn the patient's head to the back, pull the chin up, and the base of the injury moves away from the throat to prevent airway obstruction. Place the non-dominant hand on the patient mask. Apply pressure to cape the mask in front of the patient's face [9]. If the patient is an adult, press the bag with his dominant hand every 5 minutes to allow 1 liter of air to enter the lungs. If the patient has tension, breathe at the same time as your patient is trying to breathe and do not breathe during exhalation, observe the patient's chest rising and falling. While a very large airway may block the chip. If foreign matter is not removed manually in the mouth and throat before airway placement, it may lead to aspiration. In order to prevent vomiting and aspiration of the oral-pharyngeal airway, the gas reflex should be expelled immediately after recurrence [11].

Air way placement

Using a blade, move the tongue down. Insert the air way into the throat from the top right of the mouth. Another method is to place the airway from the top to the bottom of the mouth. As soon as the tube reaches the back wall of the throat, rotate the airway 180 degrees inside the mouth and position it.

Note: The end of the air way must be at the base of the loss and the rear. The opening of the pipe should be easily placed on the lips. Proper placement of the airway you should listen to the examination of respiratory sounds during ventilation for purity and equality in the lungs.

For children, move the front of the tongue forward with a spatula and insert the air way. If you turn the air way upside down and then turn it. This procedure may damage the soft tissue of the pharynx or cause damage to the teeth. So do not use this placement method for children. Place the tube next to the patient's face and choose the air way that is from the soft ear to the corner of the mouth [138].

Complications

Damage to the oral mucosa, vomiting, aspiration, nano-hypoxia or improper placement.

Conclusion

It is necessary to know how to establish and function the body's organs in normal conditions and their changes due to illness in order to understand and justify the occurrence of signs and symptoms. Although anatomy or the knowledge of internal organs and systems through direct contact and cutting the human body provides comprehensive information to doctors and medical scholars, it is limited to the exclusive use of this method to know the

physical and functional state of the tissue. Not only is it not always possible, but it can also cause considerable damage to humans. Using previous experiences on corpses and generalizing individual findings is also not possible due to the considerable differences in the anatomy of the human body. Therefore, the use of tools and technology to obtain accurate information from the inside of humans has been one of the never-ending ideals of medical scholars. Throughout history, the idealism of medical scholars in obtaining more complete information from the inside of the human body has led them to create, develop and use technology. In 1895, the German scientist Konrad Rongten discovered the existence of X-rays for the first time and accidentally discovered the unique capabilities of this ray in imaging the internal organs of the body, especially bones. In this way, a new beginning was made in the field of medical imaging. Although conventional radiology has helped medicine a lot and even today it is used in many cases, but the following weaknesses made its transformation and progress inevitable:

High and uncontrolled dose of X-rays that are harmful to the body.

Adapting the three-dimensional volume of the body on a two-dimensional image makes the organs overlap in the image and lowers the accuracy of the doctor's diagnosis.

The low contrast of the image is due to the diffusion of the radiation source and the lack of completely parallel rays.

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