

Management of Late-Onset Hemorrhagic Complication After Tracheostomy: A Case Series

Manejo de la complicación hemorrágica de inicio tardío después de la traqueotomía: una serie de casos

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SUMMARY

Background: *The incidence of post-tracheostomy bleeding is rare but can cause severe complications for patients. Although the etiology varies, the management of this complication is challenging. Case Description:* Here, we report two cases of bleeding complications after tracheostomy. The first case was a 33-year-old male patient diagnosed with cerebral infarction and a history of taking antiplatelet drugs (clopidogrel). Bleeding occurred in the lumen of the tracheostomy during the second day of post-tracheostomy care. The second patient is a 61-year-old male diagnosed with a subglottic tumour and post-tracheostomy low position. There was active bleeding from the paratracheal region. Both patients underwent stoma repair and exploration around the tracheal lumen, followed by a bronchial washing procedure. **Conclusions:** This report implies that using anticoagulants before the procedure and low-lying tracheostomy may risk the

incidence of late-onset hemorrhagic complications. Prompt treatment must be carried out in this case to prevent fatal complications.

Keywords: *Bleeding, complications, tracheostomy.*

RESUMEN

Antecedentes: *La incidencia de sangrado postraqueostomía es rara, pero puede causar complicaciones graves a los pacientes. Aunque la etiología varía, el manejo de esta complicación es desafiante. Descripción del caso:* Aquí reportamos dos casos de complicaciones hemorrágicas después de una traqueotomía. El primer caso se trata de un paciente varón de 33 años diagnosticado de infarto cerebral y con antecedentes de consumo de antiagregantes plaquetarios (clopidogrel). Se produjo sangrado en el lumen de la traqueotomía durante el segundo día de atención postraqueotomía. El segundo paciente es un varón de 61 años diagnosticado de tumoración subglótica y posición baja postraqueotomía. Había sangrado activo de la región paratraqueal. Ambos pacientes fueron sometidos a reparación de estoma y exploración alrededor de la luz traqueal, seguido de un procedimiento de lavado bronquial. **Conclusiones:** Este informe implica que el uso de anticoagulantes antes del procedimiento y la traqueostomía baja pueden poner en riesgo la incidencia de complicaciones hemorrágicas de aparición tardía. En este caso, se debe llevar a cabo un tratamiento rápido para evitar complicaciones fatales.

Palabras clave: *Sangrado, complicaciones, traqueotomía.*

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INTRODUCTION

Post-tracheostomy bleeding is a rare complication but can be life-threatening for the patient. The prevalence of post-tracheostomy bleeding is around 5 %, and an open surgical approach is riskier than the percutaneous dilatation technique (1-3). Injury to the jugular thyroid vein, thrombocytopenic conditions, use of antiplatelet drugs, and innominate tracheal arterial fistulas can contribute to post-tracheostomy bleeding (4,5).

Antiplatelet drugs can inhibit the adenosine diphosphate (ADP) pathway on platelet aggregation, a stimulus for platelet aggregation (4-6). Antiplatelet drugs are one of the main factors that trigger post-tracheostomy bleeding in patients with a history of cardiovascular disease (1,7-10). A study by the University of Manchester (2014) reported 36.2 % of cases of tracheostomy with bleeding related to coagulation factor disorders in patients with a history of multiple organ failure (11).

Erosion of major vessels after tracheostomy is usually due to pressure necrosis generated by the tracheostomy tube. Erosion is expected when the tracheostomy is below the fourth tracheal ring (5,11).

Bleeding must be quickly identified before fatal complications occur in patients (1,4,7,11). If active bleeding continues, the immediate plan is to perform surgery to explore the stoma and tracheal lumen (7,12). Prevention of tracheostomy complications is carried out with

optimal preparation. This strategic approach is supported by data that complications occur more frequently in emergency surgery cases than in planned operations (5,7). Preparation includes the skills of medical personnel, facilities for action tools, selection of appropriate operating methods, and patient conditions. Post-tracheostomy care also plays an important role (7).

CASE REPORT

CASE I

A 33-year-old man was referred from a regional hospital with a diagnosis of cerebral infarction and post-tracheostomy. The patient has a history of taking antiplatelet drugs (clopidogrel). A tracheostomy was performed at a local hospital with indications of ineffective breathing patterns and suboptimal airway clearance. Bleeding occurred in the lumen of the tracheostomy during the second day of post-tracheostomy care. Routine periodic suctioning was carried out, but the bleeding could not be resolved.

The patient was then rushed to the operating room for stoma repair and exploration around the tracheal lumen. Hemostasis was performed by external pressure on the stoma area and cauterization. After the bleeding was resolved, a pulmonary specialist performed bronchial washing to clear blood clots in the tracheobronchial area. The strict observation was carried out in the intensive care unit (ICU), and the anesthesiologist suggested administering oxygen therapy via an endotracheal tube (ETT)



Figure 1. Bleeding from the stoma and tracheal lumen (left). Tracheostomy decannulation and surgical wound closure (right).

for anticipatory measures for secondary bleeding. For this purpose, tracheostomy decannulation and wound closure were performed.

Drugs that can inhibit coagulation function were discontinued to prevent recurrent bleeding. Evaluation on the second day in the ICU treatment room found no signs of bleeding, an adequate airway, and vital signs measurements were within normal limits. Laboratory results showed impaired coagulation function with prolonged APTT.

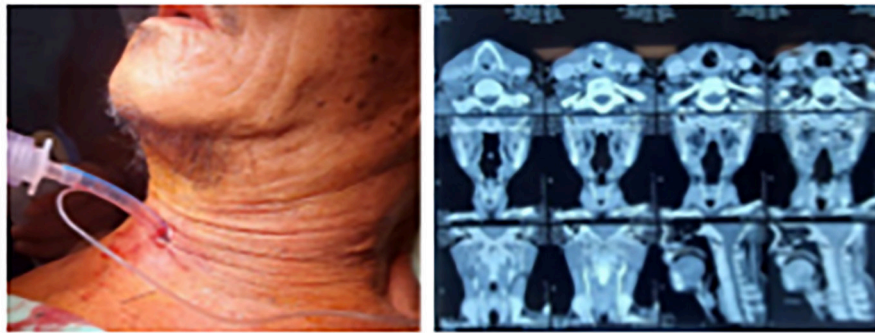


Figure 2. Low-lying tracheostomy with modified tracheal tube (left). CT Scan results show a subglottic tumor (right).

There was sudden bleeding from the tracheal stoma when the patient had just arrived at the emergency room at the referral hospital. A tracheostomy cannula was replaced and evaluated for a few moments, but the bleeding had not stopped. Immediate emergency surgery was performed to eliminate the source of bleeding. The source of bleeding was from the thyroid artery at the level of the IV-V tracheal rings during exploration. This artery was then ligated, and the bleeding was resolved. A tracheostomy cannula was placed, and strict observation was continued in the ICU treatment room. The patient was discharged five days later and continued treatment in outpatient care.

DISCUSSION

Post-tracheostomy complications quickly occur when bleeding less than 48 hours after surgery. They can be caused by trauma to the jugular thyroid vein, thrombocytopenia, a history of

CASE II

A 61-year-old patient was referred from the regional hospital five days after an emergency tracheostomy for a subglottic laryngeal tumor. The patient was treated for three days in the ICU of the local hospital before being referred. A low tracheostomy was performed due to the tumor's low location and the patient's sitting position. Due to the absence of a tracheostomy cannula in the local hospital, the anesthetist modified the use of a tracheal ventilation tube.

antiplatelet drug use, and bronchopneumonia (4). Meanwhile, it is said to have a slow onset when bleeding occurs three days after surgery and is often associated with an innominate tracheal arterial fistula (4,5). In the first case, it was an acute onset where bleeding occurred two days after surgery, and the patient had a history of taking antiplatelet drugs (clopidogrel). In the second case, the onset was slow because the bleeding occurred five days after the tracheostomy.

The mechanism of action of antiplatelet drugs is reducing platelet aggregation, thereby inhibiting thrombus formation in the arterial circulation. Antiplatelets play a role in treating and preventing myocardial infarction, stent thrombosis, and hemorrhagic stroke. However, these drugs have some unwanted side effects, including spontaneous bleeding (6,13). The first patient had a history of consuming clopidogrel at the referral hospital, with laboratory results showing a prolonged APTT value.

Late-onset bleeding after a tracheostomy is generally caused by erosion of the vessels

around the trachea. The most common source of bleeding is the brachiocephalic artery, which is at significant risk of causing massive bleeding and death for the patient (5,14). In both patients, the source of bleeding was from the thyroid artery at the level of the IV-V tracheal rings. The erosion that arises is probably due to the tracheostomy's low position and inappropriate tracheal tube modifications.

Immediate treatment is needed if bleeding occurs in a post-tracheostomy patient before complications that endanger the patient's life occur (1,4,7,11). If the bleeding cannot be controlled, it is necessary to take immediate action in the operating room to stop the source of the bleeding. Surgical measures can be taken, including chemical or electrical cauterization and ligation of blood vessels, which are the source of bleeding (7,15). In the first patient, external pressure was applied to the stoma, and the bleeding source was electric cauterization. Meanwhile, thyroid artery ligation was performed in the second patient, which was the source of bleeding. Bronchial washing is performed by a pulmonologist to clean blood clots in the tracheobronchial tract.

CONCLUSIONS

Post-tracheostomy bleeding can be fatal to the patient. This patient had acute onset bleeding complications due to a history of antiplatelet drug administration, with laboratory results showing prolongation of the APTT. Drugs that can interfere with coagulation function must be stopped before tracheostomy to prevent unwanted complications after surgery. Late-onset bleeding may be caused by erosion of the blood vessels around the trachea. Therefore, prompt treatment must be carried out so as not to cause fatal complications for the patient. In addition, patients with low-lying tracheostomy must be closely observed because of the area's high risk of vascular injury.

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