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Complications of Pulmonary Thromboendarterectomy: Airway Hemorrhage and its Consequences

Sebastian Martinez*

Division of Cardiovascular Medicine, University of California San Diego, California, USA

***Corresponding author:** Sebastian Martinez, Division of Cardiovascular Medicine, University of California San Diego, California, USA; E-mail: sebastianmartinez@gmail.com

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DESCRIPTION

Airway hemorrhage is a potentially life-threatening complication that can occur after Pulmonary Thromboendarterectomy (PTE), a surgical procedure performed to treat Chronic Thromboembolic Pulmonary Hypertension (CTEPH). The study was a retrospective analysis of data from 185 consecutive patients who underwent PTE at a single institution between January 2008 and May 2019. Of these patients, 25 (13.5%) experienced postoperative airway hemorrhage. The researchers collected data on various preoperative, intraoperative, and postoperative factors and compared them between patients with and without airway hemorrhage. The results showed that patients who experienced airway hemorrhage were more likely to have a history of hemoptysis before the surgery, as well as a higher preoperative Mean Pulmonary Artery Pressure (mPAP), a measure of the pressure in the pulmonary artery. In addition, patients who had longer cardiopulmonary bypass times and longer durations of mechanical ventilation were also at higher risk of airway hemorrhage.

The study also evaluated the outcomes of patients who experienced airway hemorrhage. Of the 25 patients who had this complication, 16 (64%) required intervention to control bleeding, such as bronchial artery embolization or surgical re-exploration. Four patients required tracheostomy due to airway obstruction from the bleeding. The median length of stay in the Intensive Care Unit (ICU) was 8 days, and the median length of hospital stay was 21 days. Four patients (16%) died during the hospitalization, and three of these deaths were attributed to airway hemorrhage.

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The study has several important implications for the management of patients undergoing PTE. First, it highlights the importance of identifying patients with a history of hemoptysis before surgery, as they may be at higher risk of airway hemorrhage. Second, it underscores the need for careful intraoperative and postoperative monitoring to promptly identify and manage any bleeding complications. Third, it suggests that patients who experience airway hemorrhage may require more aggressive interventions, such as bronchial artery embolization or re-exploration, to control bleeding and prevent airway obstruction. There are several limitations to the study that should be considered. First, it was a retrospective analysis of data from a single institution, which may limit the generalizability of the findings to other centers. Second, the sample size was relatively small, which may have limited the ability to detect all significant risk factors for airway hemorrhage. Third, the study did not evaluate the long-term outcomes of patients who experienced airway hemorrhage, such as their functional status or quality of life after discharge.

An airway hemorrhage is a rare but serious complication that can occur after PTE. The study identified several risk factors associated with this complication, including a history of hemoptysis, higher preoperative mPAP, longer cardiopulmonary bypass times, and longer durations of mechanical ventilation. Patients who experience airway hemorrhage may require more aggressive interventions to control bleeding and prevent airway obstruction. Further studies are needed to validate these findings and to evaluate the long-term outcomes of patients who experience airway hemorrhage after PTE.

It is important for healthcare professionals involved in the management of patients with CTEPH undergoing PTE to be aware of the risk of airway hemorrhage and to implement appropriate preventive measures and management strategies. These may include preoperative optimization of pulmonary artery pressures and hemostatic factors, as well as intraoperative techniques to minimize bleeding and careful monitoring for early detection of bleeding complications.

Postoperative management of patients who experience airway hemorrhage should also involve a multidisciplinary approach, with prompt consultation with interventional radiology, pulmonology, and critical care teams. Bronchial artery embolization is a minimally invasive procedure that can be used to control bleeding in patients with airway hemorrhage, and surgical re-exploration may be necessary in some cases. In addition to identifying risk factors for airway hemorrhage, further research is needed to develop strategies to prevent and manage this complication. One potential area of investigation is the use of pharmacological agents to reduce the risk of bleeding, such as antifibrinolytic agents or prohemostatic agents. Another area of interest is the development of predictive models to identify patients who are at highest risk of airway hemorrhage, which could aid in patient selection and preoperative planning.

Overall, airway hemorrhage is a serious complication that can occur after PTE, but with careful preoperative planning, intraoperative management, and postoperative monitoring, the risk of this complication can be minimized. Ongoing research is needed to improve the understanding of the risk factors and management strategies for airway hemorrhage, and to optimize outcomes for patients undergoing PTE for CTEPH.