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Emergent procedures for oropharyngeal bleeding during the COVID-19 pandemic: Protection of medical staff

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ABSTRACT

During an ongoing pandemic of COVID-19, controlling the oropharyngeal bleeding, such as post-tonsillectomy hemorrhage, with cautery is considered a very vulnerable procedure for medical staff because of high probability of exposure to aerosolized secretions. The authors aimed to introduce an appropriate treatment protocol for oropharyngeal bleeding that provides first aid to patients while protecting medical staff at high-risk of infection such as COVID-19.

1. Introduction

Coronavirus 19 (COVID-19) was first reported in Wuhan, China. The World Health Organization declared COVID-19 to be a pandemic (the highest possible risk assessment level) on March 20, 2020. As of April 4, 2020 (Korean time), there have been 1,134,124 confirmed cases and 60,305 deaths (a mortality rate of 5.33%) in 210 countries worldwide; there have been 10,156 confirmed cases and 117 deaths (mortality rate 1.74%) in South Korea. During the outbreak of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in 2015, nosocomial infections with MERS-CoV were reported in major tertiary care hospitals in South Korea; the Korean government shut down such hospitals for the duration of the disease incubation period as soon as infections were confirmed. Thus, patients with emergent postoperative bleeding or other critical complications had to be transferred to other hospitals [1].

Currently, patients who have visited contagious areas, such as hospitals shut down because of nosocomial COVID-19 infection within the prior 2 weeks, are considered to be at high risk of infection; for such patients, COVID-19 screening is required before surgery or hospitalization. However, in contrast to patients undergoing elective surgeries or procedures, patients who exhibit emergent postoperative hemorrhage cannot wait for test results prior to treatment.

Tonsillectomy is one of the most common surgeries and post-tonsillectomy bleeding occurs with some frequency; its incidence is approximately 2–4% and the resulting death rate is 1 in 20,000 [2,3]. During bleeding control in the emergency room or operating room, physicians are at very high risk of infection by aerosol-borne COVID-19 from the oral and nasal cavities of infected patients. More recently, head-and-neck surgeons have been required to manage post-oropharyngectomy bleeding in patients undergoing transoral robotic surgery to treat tonsillar cancer; the bleeding rate is 6.47% [4]. Here, we sought to create an appropriate treatment protocol for post-tonsillectomy bleeding that helps patients and concurrently protects medical staff at high risk of infection from COVID-19.

2. For the physician

If you are asked to accept a patient transfer from a hospital closed because of nosocomial infections, you are to request the following information and perform the following checks:

Patient medical information
1) Type of operation, current status, emergency status;
2) Date of operation, date of discharge (if relevant), date of last outpatient visit (if relevant);
3) Duration of hospitalization overlap with that of any patient with confirmed COVID-19, and extent of contact with any such patient;
4) COVID-19 screening test result, if available.

Receiving facility situation
1) Check medical staff availability and their ability to provide any necessary treatment;
2) Check availability of a negative-pressure ward room and a negative-pressure operating room.
If a patient visits the emergency room without calling first, the patient is initially assumed to be contagious; all patient/medical staff interactions must proceed in a negative-pressure room if at all possible. The patient should be scheduled for chest posteroanterior X-ray, laboratory tests, and COVID-19 PCR screening. If the patient’s vital signs are stable, a thorough history-taking should explore the following items prior to any procedure:

1) Any history of close contact with an individual who had confirmed COVID-19 in the past 2 weeks?
2) Any history of travel abroad in the past 2 weeks (i.e., during the COVID-19 pandemic)?
3) Any epidemiological link with any domestic outbreak in the past 2 weeks?
4) Any COVID-19 symptom (e.g., fever, chills, cough, and/or loss of taste or smell)?

In general, it is best to control bleeding in the outpatient clinic; however, the patient should not be moved from the emergency room to the outpatient clinic if the negative-pressure facility is not prepared. Most ear-nose-and-throat outpatient clinics are not equipped with negative-pressure facilities; bleeding may require treatment in a negative-pressure room adjacent to the operating room or in the operating room itself (under negative pressure). To identify the bleeding site, the patient must remove any mask and the doctor must look closely into the patient’s mouth. The doctor is thus at risk of exposure to patient body fluids if a cough reflex is triggered when blood is aspirated. Aerosols are always generated during suction or electrocauterization. Therefore, if the patient belongs to a high-risk group or is confirmed to have COVID-19, medical staff should work within negative-pressure facilities and wear high-level (level D) personal protective equipment (PPE) or powered air-purifying respirators. It is best to use a portable ear-nose-and-throat endoscope (30/70°); if this is not available, a headlight should be fitted to the PPE prior to any procedure. If an endoscope is not used, the distance between the patient and the doctor is very small. Only the minimal number of medical staff should be present, to conserve PPE and medical resources and to protect the staff. In general, one surgeon and one assistant are sufficient. The assistant must also wear level D PPE. All medical staff must be experienced and must discuss the planned surgery in detail prior to the procedure, thereby minimizing communication errors caused by protective garb. Tracheostomy performed in the intensive care unit generates aerosols that may transmit disease to medical staff. During the SARS outbreak, medical staff used a wide range of PPE (from face shields to powered air-purifying respirators) during surgery [5–8]. PPE use was essential to prevent disease transmission. If bleeding is not controlled in the negative-pressure room, the patient must be transferred to the operating room; thus, it is necessary to check the planned patient flow plan and the availability of an anesthesiologist in the negative-pressure operating room. To minimize exposure to patient-derived aerosols during the procedure, it is important to note the following:

1) Prior to the procedure, anesthetize the oral cavity and pharynx using xylocaine spray to suppress the gag and cough reflexes;
2) Minimize suctioning. If suctioning is essential, use a closed inline suction system fitted with a viral filter;
3) Treat the patient gently to reduce the gag reflex;
4) Control active bleeding via cottonoid compression and minimize the use of electrocauterization

At the end of the procedure, carefully dispose of all waste and thoroughly decontaminate all equipment, while avoiding contamination of the environment. All responsible personnel should wear appropriate PPE (Fig. 1).

3. Conclusion

During the ongoing COVID-19 pandemic, medical staff who must control oropharyngeal bleeding (e.g., post-tonsillectomy hemorrhage) via cauterization are at high risk of exposure to patient-derived aerosols. Therefore, if a patient even may be infected with COVID-19, medical staff should treat the patient in a negative-pressure room and should wear level D PPE.

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References

[1] Her M. How is COVID-19 affecting South Korea? What is our current strategy? Disaster Med Public Health Prep 2020;1–7.
[2] Howells 2nd RC, Wax MK, Ramadan HH. Value of preoperative prothrombin time/
partial thromboplastin time as a predictor of postoperative hemorrhage in pediatric patients undergoing tonsillectomy. Otolaryngology—head and neck surgery: official journal of American Academy of Otolaryngology-Head and Neck Surgery 1997;117:628–32.

[3] Krishna P, Lee D. Post-tonsillectomy bleeding: a meta-analysis. Laryngoscope 2001;111:1358–61.

[4] Stokes W, Ramadan J, Lawson G, Ferris FR, Holsinger FC, Turner MT. Bleeding complications after transoral robotic surgery: a meta-analysis and systematic review. The Laryngoscope 2020. ISSN: 0023-852X Online ISSN: 1531-4995.

[5] Ahmed N, Hare GM, Merkley J, Devlin R, Baker A. Open tracheostomy in a suspect severe acute respiratory syndrome (SARS) patient: brief technical communication. Canadian journal of surgery Journal canadien de chirurgie 2005;48:68–71.

[6] Chee VW, Khooh ML, Lee SF, Lai YC, Chin NM. Infection control measures for operative procedures in severe acute respiratory syndrome-related patients. Anesthesiology 2004;100:1394–8.

[7] Kwan A, Fok WG, Law KI, Lam SH. Tracheostomy in a patient with severe acute respiratory syndrome. Br J Anaesth 2004;92:280–2.

[8] Wei WL, Tsuen HH, Ng RW, Lam JK. Safe tracheostomy for patients with severe acute respiratory syndrome. Laryngoscope 2003;113:1777–9.