This manuscript has been accepted for publication in Otolaryngology-Head and Neck Surgery.

Clinical Recommendations for Epistaxis Management during the COVID-19 Pandemic

Vittorio D'Aguanno[1] MD, Massimo Ralli[1]* MD PhD, Antonio Greco[1] MD, Marco de Vincentiis[2] MD

1. Department of Sense Organs, Sapienza University of Rome, Italy
2. Department of Oral and Maxillofacial Sciences, Sapienza University of Rome, Italy -

* Corresponding Author: Massimo Ralli, MD, Department of Sense Organs, Sapienza University of Rome. Viale del Policlinico 155, 00186, Rome, Italy. Phone: +39 0649976808; E-mail: massimo.ralli@uniroma1.it

Sources of funding: The authors declare that they have no sources of funding.

Conflict of interest: The authors declare that they have no competing interests.

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authorship Contributions

Massimo Ralli: conception of the work, drafting the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Vittorio D'Aguanno: design of the work, drafting the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

This manuscript has been accepted for publication in Otolaryngology-Head and Neck Surgery.

Antonio Greco: interpretation of the data, revision of the work critically for important intellectual content, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Marco de Vincentiis: conception of the work, revision of the work critically for important intellectual content, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

This manuscript has been accepted for publication in Otolaryngology-Head and Neck Surgery.

Abstract

Epistaxis is a common complaint in the general population and treatment of epistaxis is a common procedure in emergency departments. In the COVID-19 era, procedures involving airway management are particularly at risk for healthcare workers, due to the high virulence of virus, also through aerosol, and the risk of contagion from asymptomatic patients. In this paper, we propose a simple memorandum of clinical recommendations to minimize the operator infection risk deriving from epistaxis management. The correct use of personal protective equipment and the strict compliance of the behavioral guidelines are essential to reduce the potential risk of infection. In particular, the use of filtering masks is strictly recommended since all patients, including those referring for epistaxis, should be managed as COVID-19 positive in the emergency department. The safety of health-care workers is essential not only to safeguard continuous patient care but also to limit virus transmission.

Keywords: epistaxis, COVID-19, emergency, otolaryngology.

Introduction

The outbreak of Sars-Covid-2 2019 (COVID-19) has evolved rapidly into a public health crisis and has spread exponentially to other parts of the world [1]. Medical professionals caring for COVID-19 patients are at high risk of contracting the infection, since the high virulence and the occurrence of contagion from asymptomatic individuals [2]; in Italy, the percentage of healthcare workers infected by COVID-19 accounts for about 10% of total patients [3]. Procedures involving airway management are particularly at risk for potential generation of aerosols or droplet laden with viral particles [4], thus specific guidelines have been proposed for some aerosol-generating procedures in hospitalized patients such as tracheostomy [5,6].

Among diseases requiring ED prompt treatment, epistaxis accounts for about 0.5% of all ED visits and up to one-third of all otolaryngology-ED procedures [7]. In this article, we propose a simple memorandum of clinical and behavior recommendations to minimize the infection risk for healthcare workers involved in the treatment of epistaxis in the ED.

Clinical Recommendations for epistaxis

Personal protection

As a general rule, all patients should be managed as COVID-19 positive with highest level of PPE by healthcare workers. The use of disposable equipment must be strictly recommended. The use of filtering masks has been widely debated and have demonstrate to protect against aerosols. FFP3 (Europe) or N99 (US) masks, that allow a minimum 99% filtration, must be preferred to any other option [8]. However, in case of FFP3 mask absence, FFP2 or N95 masks can be used, covered by a surgical mask [6]. Cap and shoe covers are considered necessary for safely dressing, eye protection through the use of surgical goggles or a face shield is required, and the use of double gown is preferable, where available. The use of double nitrile gloves is recommended [3 6].

Clinical assessment

Before clinical procedure, all patients should be asked about contact at risk for COVID-19, fever, respiratory symptoms. Patient referring sudden loss of smell and/or taste should be considered at high risk for COVID infection [9]. Patients should wear a surgical mask covering mouth, if permitted by the clinical condition.

Prompt assessment of the severity of epistaxis should be performed by a physician or a nurse in the ED to distinguish patients that requires a prompt management from patient that do not. Patients with prolonged bleeding, bleeding from both sides of the nose or from the mouth, or any signs of acute hypovolemia (tachycardia, syncope, orthostatic hypotension) must be immediately treated, while patients with a minor active bleeding should be addressed in a non-ED setting where available.

Non-invasive intervention for nosebleed, including bi-digital compression to the lower third of the nose, should be strictly recommended before attempting more invasive interventions.

Room setting

Invasive treatment should be ideally performed the operating room (OR); however, well-demarcated areas within the ED complex should be used if conventional OR is not available.

Only experienced clinical team with proper PPE should be involved in treatment of simple anterior epistaxis, preferably including a surgeon and a scrub nurse. Additional clinical staff should be reserved for selected cases, anesthetist should be needed in the cases of more advantaged disease or for patients requiring sedation in a conventional OR.

Treatment

Nasal packing or cautery should be performed in case of failure of non-invasive procedures, like compression, or in case of a nosebleed judged to be life-threatening or unlikely to respond to further compression alone. The use of resorbable packing is recommended, if available, in order to reduce the need for future visits, although experience and local availability of resorbable packing may dictate the specific type of material used.

Posterior epistaxis requiring sphenopalatine artery ligation should be postponed until COVID-19 testing is performed [10].

The use of local anesthetic atomized sprays should be avoided and soaked pledgets should be preferred [10].

Suction system should be used during the procedure within a closed system with a viral filter (5).

Post-procedure recommendations

Post-procedural instructions regarding packing removal or antibiotic prophylaxis should be provided to the patient to reduce risks of recurrences and optimizing outcomes.

"Gowning and de-gowning" procedures should be carefully executed, as improper removal may result in operator contamination (5). The post-procedure waste disposal and decontamination of equipment need careful consideration to minimize contamination of the environment. Personnel who handle the decontamination of surgical equipment should also be appropriately protected in standard PPE (**Table 1**).

Discussion

Epistaxis is a common compliant in the general population [7], and its management should be considered a COVID-19 at-risk procedure for several reasons. Firstly, the surgical treatment of epistaxis is inevitably at risk for droplets emission and viral transmission due to the close contiguity of physician and patient. Moreover, nasal packing without anesthesia or sedation may be painful, thus the patient is unable to control involuntary reflex, as coughing. Secondly, treatment of epistaxis needs a prompt medical intervention, thus presence of respiratory symptoms or contacts at risk of the patient may not be properly investigated. Thirdly, anterior nasal packing is generally performed by non-specialist physicians in various settings, including the outpatient office or emergency department. Last, "undressing/doffing" procedures after epistaxis management may be considered at risk of COVID infection for accidental contact with the contaminated PPE [10].

Conclusion

Treatment of epistaxis is a frequent procedure performed in the ED and exposes healthcare workers at risk of contagion. Specific recommendations should be followed before, during and after epistaxis intervention to ensure the safety of healthcare workers.

References

1. Zhu N, Zhang D, Wang W, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med.* 2020;382(8):727-733.

2. To KK, Tsang OT, Leung WS, et al. Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. *Lancet Infect Dis.* 2020.

3. (ISS) ISdS. Integrated Surveillance of COVID-19 in Italy; . https://www.epicentro.iss.it/coronavirus/bollettino/Infografica_28marzoENG.pdf. Published 2020. Accessed.

4. Cheung JC, Ho LT, Cheng JV, Cham EYK, Lam KN. Staff safety during emergency airway management for COVID-19 in Hong Kong. *Lancet Respir Med.* 2020;8(4):e19.

5. Tay JK, Khoo ML, Loh WS. Surgical Considerations for Tracheostomy During the COVID-19 Pandemic: Lessons Learned From the Severe Acute Respiratory Syndrome Outbreak. *JAMA Otolaryngol Head Neck Surg.* 2020.

6. Pichi B, Mazzola F, Bonsembiante A, et al. CORONA-steps for tracheotomy in COVID-19 patients: A staff-safe method for airway management. *Oral Oncol.* 2020;105:104682.

7. Tunkel DE, Anne S, Payne SC, et al. Clinical Practice Guideline: Nosebleed (Epistaxis). *Otolaryngol Head Neck Surg.* 2020;162(1_suppl):S1-S38.

8. Offeddu V, Yung CF, Low MSF, Tam CC. Effectiveness of Masks and Respirators Against Respiratory Infections in Healthcare Workers: A Systematic Review and Meta-Analysis. *Clin Infect Dis.* 2017;65(11):1934-1942.

9. Benezit F, Le Turnier P, Declerck C, et al. Utility of hyposmia and hypogeusia for the diagnosis of COVID-19. *Lancet Infect Dis.* 2020.

10. L. Van Gerven PH, T. Cox, W. Fokkens, C. Hopkins, V. Hox, M. Jorissen, A. Schuermans, P. Sinonquel, K. Speleman,, V. Vander Poorten KVG, T. Van Zel, I. Alobid. Personal protection and delivery of rhinologic and endoscopic skull base procedures during the COVID-19 outbreak. *Rhinology.* 2020;54(0).

This manuscript has been accepted for publication in Otolaryngology-Head and Neck Surgery.

Table 1: Clinical recommendations for epistaxis during the COVID pandemic.

Personal protection	The use of disposable equipment must be strictly recommended. FFP3 (Europe) or N99 (US) masks must be preferred. FFP2 or N95 masks can be used in case of FFP3 mask absence, covered by surgical mask. Cap and shoe covers, Goggles, Gown and double nitrile gloves are strongly recommended.
Clinical assessment	Control risk factors for nosebleed (blood pressure, anticoagulants). check fever, respiratory symptoms and contact at risk. Sudden loss of smell and/or taste should be investigated. dress patients with a surgical mask, if permitted. Prompt assessment of the severity of nosebleed should be achieved immediately. Non-invasive intervention for nosebleed is recommended.
Room setting	If conventional ORs are not available, well-demarcated areas within the ED complex should be used. Reduced and experienced clinical staff with proper PPE including a surgeon and a scrub nurse.
Treatment	Avoid intervention unless necessary. Nasal packing or cautery should be performed in case of failure of non-invasive procedures. Resorbable packing should be recommended, if available. Posterior epistaxis requiring sphenopalatine artery ligation should be postponed until COVID 19 testing is performed before surgical intervention. Local anesthetic atomized sprays should be avoided and soaked pledgets preferred. Suction system should be used during the procedure within a closed system with a viral filter.
Post-procedure recommendations	Post-procedural instructions regarding packing removal or antibiotic prophylaxis should be provided to the patient to reduce risks of recurrences and optimizing outcomes. Gowning and de-gowning procedures should be carefully executed.

	Personnel who handle the decontamination of surgical equipment should also be appropriately protected in standard PPE.

This manuscript has been accepted for publication in Otolaryngology-Head and Neck Surgery.