



Personal protective equipment for ENT activity during COVID-19 pandemic

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Abstract

Background In the COVID-19 era physicians have to face with need to perform office procedures maintaining the maximum safety for both the patient and the Doctor himself. The purpose of this paper was to suggest some equipment useful to perform outpatient visits in an ENT setting.

Methods A simple modification of the standard headlight used during an ENT visit provides the operator a better face protection without any impairment in vision and comfort. In addition, in order to perform a safer ENT examination, a droplet protective barrier has been adapted to the patient's chair.

Results Both the devices have been tested with success during a period of 2 months in our ENT clinic. No cases of contamination have been registered among physicians.

Conclusion A simple modification to a device used in the routine ENT activity implemented its protective efficacy with low costs. On the other hand, a more structured tool permitted to obtain a more protected environment during patient examination.

Keywords COVID-19 · SARS-COV-2 · Protective devices · Personal protective equipment · ENT endoscopy · Endoscopic nasopharyngoscopy · Headlight · risk of contamination · Examination chair

The risk of getting a COVID-19 infection is very high among physicians. This is particularly true for those who deal with upper respiratory airway as otolaryngologists, maxillofacial, or dentists [1]. The need to protect both the doctors and the patients can cause serious discomfort during the visit due to the need to wear several personal protective equipment (PPE) which can impair the visibility and access to some anatomical areas. Oral and nasal cavity examinations are at high risk to produce droplets. Indirect visualization of the larynx with the mirror is even at higher risk of droplet contamination with the ENT directly facing the patients while breathing deeply. The use of rigid or flexible endoscopes could increment the distance between patient and physicians but does not eliminate the risk of

contamination. For this reason, some authors recommend the use of a backward approach [2] which anyway needs some training due to the unusual positioning of the patient.

During the first phase of the Coronavirus pandemic most otolaryngologists had to face two problems:

1. To safely perform an ENT visit using a headlight for basic ENT examination
2. To perform nasal endoscopy and/or laryngoscopy without directly facing the patient.

In the first case, the simultaneous use of both a headlight and a protective shield could be difficult or even impossible. Use of goggles could be a suitable option to protect eyes but it is impaired by fogging and discomfort in case of prolonged use. We found a solution to this issue by applying a flexible custom-made “shield” which could be applied directly by fixing it on the scaffold of the headlight (Fig. 1). Figure 2 shows a template of how a flexible sheet (A4 Laminating Pouches, Gloss 125 micron) should be cut according to the shape of the headlight. The holes made in the shield are designed to fix it with the push button locks which are usually present in the headlamp to fix the

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Fig. 1 ENT headlight equipped with protective flexible shield fixed with button locks

forehead cushion to the headband itself. Whenever these push button locks are not already present in the headlamp the shield could be fixed passing a self-locking plastic cable tie around the headband and inside each hole. This solution resulted to be very effective in our experience

in any ENT procedure requiring a frontal headlight. This is particularly true in those procedures where a higher risk of droplets is predictable as in tracheostoma care in COVID-19 positive patients, a situation that could increase significantly during this pandemic [3].

In the second case, with the collaboration of a craftsman of methacrylate, we created a liftable protective shield to be applied to the ENT examination chair (Fig. 3). This handmade cover works as a droplet protective barrier and permits to safely perform a complete ENT visit (Video 1). The tilting methacrylate cover fixed to the chair with an aluminum structure could be moved in the upper position to allow the patients to sit on the chair. Then it will be pivoted downward to protect both the patient and the physician. Two holes created in the frontal portion of the methacrylate panel allow the examiner to introduce his hands. An aperture on each side allows the assistant to pass the necessary equipment without being in direct contact with the patient. The frontal holes are equipped with two washable sleeves which avoid any further contamination. Passage of air is guaranteed by a posterior aperture and a superior “flap” which channel the air posteriorly and above. The methacrylate material can be easily decontaminated after every use with a microfiber cleaning cloth and a common disinfectant for medical devices. This protection permits a safe and complete exploration of ears, nose throat and neck with otoscopy, anterior rhinoscopy, indirect laryngoscopy, and endoscopic nasopharyngoscopy with rigid or flexible endoscopes.

Fig. 2 Example of a template to create the shield by cutting a Laminating pouch

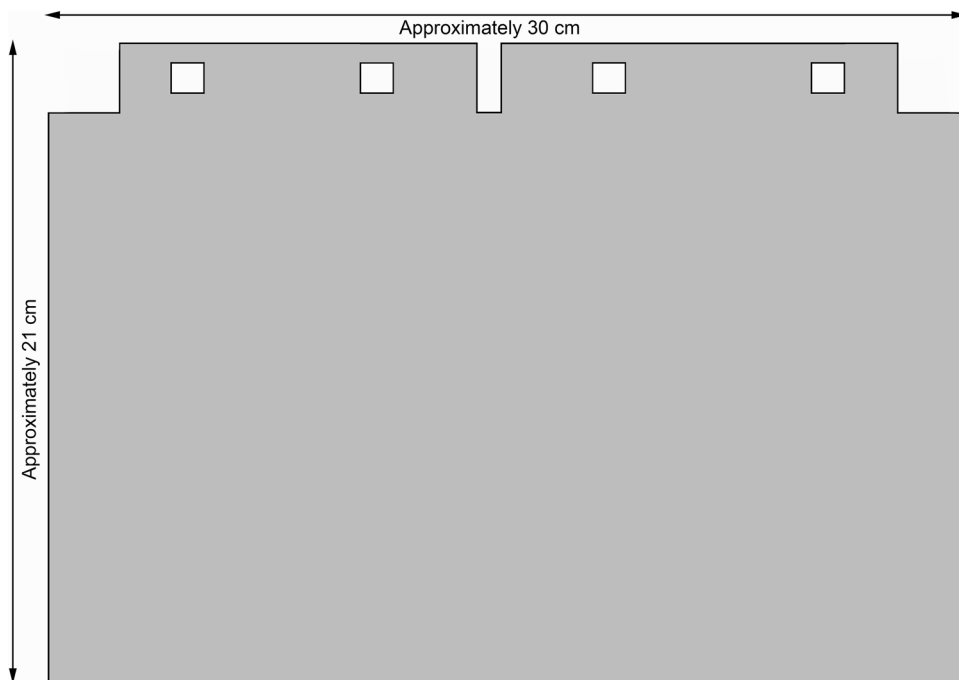




Fig. 3 Example of the methacrylate protective shield applied to an examination chair

Conclusion

These technical solutions could help to minimize the use of PPE while protecting the healthcare worker as suggested by the World Health Organization [4]. Moreover, they could help to re-start a normal ENT outpatient activity faster reducing the risk of contamination and lowering the costs for PPE.

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Compliance with ethical standards

Conflict of interest The authors have no conflicts of interest to declare.

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Informed consent No need for informed consent since no human subjects were involved.

Consent participant All authors agreed with the content of this paper and gave explicit consent to submit it to the European Archives of Oto-Rhino-Laryngology.

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