

9 Tips and Pearls for Safer Performance of Dermatological Procedures during Covid-19 Pandemic

Abstract

SARS-CoV2 pandemic has affected dermatology practice greatly. In view of the risk of transmission, physicians need to devise methods to perform procedures in a *safer* way. Our institute has adopted a number of innovative safety precautions steps, which are being outlined here.

Keywords: *Aesthetic, dermatology, Covid-19, coronavirus, laser, procedures, radiofrequency*

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) is an enveloped RNA virus with a genome size of 26 – 32 kilobases.^[1,2] It is transmitted through droplets or contact transmission. Research has shown that the receptors required for the attachment and entry of SARS-CoV2 virus to host cells are transmembrane protease serine 2 (TMPRSS2) and angiotensin-converting enzyme 2 (ACE2) receptors.^[2] While TMPRSS2 receptors have not been demonstrated in skin, ACE2 receptors which are necessary for attachment of SARS-CoV2 after priming with TMPRSS2 have been demonstrated in keratinocytes (confined mainly to stratum basale and spinosum), eccrine glands, and to a lesser extent fibroblasts. This has raised concerns about transmission, through procedures, which impair skin barrier, particularly if they generate aerosols.^[3] This has affected dermatosurgical practice and has necessitated safety measures that have been published in several guidelines. In this article, we outline additional specific steps practiced at our center to make these procedures “safer”.

1. Observation for 2 weeks prior to the procedure

Since the incubation period of COVID is about 14 days, it is useful to watch the patient for 2 weeks prior to the procedure. At first visit, the patient is sensitized about the procedure and advised about priming of the skin prior

to the procedure. The patient is also advised to restrict travel/meeting new individuals and to observe and report if any signs of cough, sore throat, and fever occur. This 2 weeks period is utilized to build rapport with the patient, to get to know the patient better, and to ensure that procedure can be done safely in the patient.

2. Double gloves—Double gloves are useful, as this allows removal of the soiled or contaminated outer glove soon after a procedure, letting one move to documentation or other patients and thus minimal time wasted.^[4]

3. Povidone-iodine (PVI) gargles and nasal spray: Saliva contains a high load of SARS-CoV2 viral load with up to 1.2×10^8 infective copies/mL. It has also been discovered that viral load is highest in nasopharynx followed by oropharynx and mouth in descending order.^[5] Hence, cleaning of oral and nasal cavity with a virucidal solution prior to procedures might render the procedure safer for both doctor and patient. PVI solution for skin cleaning is available as a 10% solution and the lowest concentration of povidone-iodine found to be effective against SARS-CoV was 0.23% with an exposure duration of 2 min to reduce viral load to an undetectable level.^[6]

Preparation: As betadine is available as 10% solution, we diluted the solution using normal saline to achieve a

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concentration of 0.5%. (9 mL of normal saline to be added to 1 mL of 10% betadine solution). This solution is kept in a sterile bottle with spray pump.

For nasopharynx cleansing – 0.28-0.30 ml of 0.5% solution of PVI is sprayed into each nostril (2 sprays in each nostril). Contralateral nostril should be closed while administering in other one. This gives a total dose of 0.33 mg of iodine.^[6]

For oral cavity – 9 mL of the 0.5% solution is given to the patient and the patient is instructed to gargle the same and keep inside the oral cavity for at least 30 seconds. The solution should be held for a few seconds at the back of the throat before spitting out to ensure the cleansing of posterior oropharynx. It has been postulated that only 1 mL of solution is retained and absorbed giving an estimated dosage of 0.55 mg of PVI. If the patient is not able to gargle, 7 sprays can be used aimed (equivalent dosage) at different directions in the oral cavity, and the patient is asked to lick later remaining PVI in the oral cavity.^[7]

4. Modified mask for facial aesthetic procedures

One obstacle in performing procedures over face was how to spare the area for procedure while assuring adequate coverage of nose and mouth area, for protection of patient as well as staff and doctor. We modified the surgical/3-ply mask by marking 4 points –

First patient is asked to wear the mask and to look straight with eyes at same level

- 1st point - upper edge of the mask in line with medial pupillary line symmetrical on both the sides.
- 2nd point - on the outer edge of nasolabial fold at level of lower border of nasal alae.
- 3rd point - 1 cm lateral to angle of mouth on both the sides
- 4th point – 1 cm below mento-labial sulcus.

A margin of 1 cm is kept and edges are sealed with 3 M double-sided sticking tape. Figure 1 shows the image of a patient wearing a modified mask. Figure 2 shows a simple line diagram for preparing a modified mask for the patient.^[8]

However, this method leads to wastage of resources as that mask cannot be reused after the procedure. Hence an alternative method is to fold the mask and fix it in the center of the face-covering only nose and mouth without cutting the mask.

This method is not suitable for procedures over the upper lip or nose.^[8]

The below pearls are specific for aerosol-generating procedures such as Lasers, Radiofrequency, etc.:

5. Cling film During Laser procedures: Transmission may happen through fomites particularly metallic surfaces where the virus can survive for up to 72 h.^[9] Cling films can be wrapped around the handpieces while



Figure 1: Mask worn by the patient has been modified sparing the area over the cheek for laser. Other measures of protection—doctor N-95 mask, face shield, and surgical cap with surgical gown; smoke evacuator on the left side. Laser probe and arm covered with cling film which is changed for every patient

performing procedures where the handpiece is placed in direct contact with the skin. In addition, cling film can also be applied to the treatment area like for tattoo removal. This technique prevents tissue splatter and hence reduces the generation of aerosols during procedures. Catherine Chen *et al.* performed a study to measure the transmissibility and loss of laser energy when passed through various transparent surfaces using Q-switched Alexandrite laser. Handiwrap cling film showed a 7% loss of energy which was significantly less when compared to tegaderm (26% loss) or acuderm dressing (41% loss).^[10]

6. Glass slides during laser procedures: Laser hair reduction using glass slide, as done for diascopy, is one method to treat difficult to treat hair by laser hair removal as it removes the competing chromophore oxy hemoglobin by vasoconstriction. The same technique can be used for laser hair removal procedures, to minimize the exit of plumes that are generated due to evaporation of shaft during laser hair removal.^[11] A loss of 8% transmission of energy is seen when a glass slide is used as interface.^[10]
7. Gel – Use of transparent USG gel as an interface between the laser handpiece and area to be treated reduces the number of plumes generated during the procedure.^[12] First skin is cleansed with spirit followed by saline and gel is applied on the area to be treated. Gel bottle should be kept in the refrigerator upside down, cool gel provides added benefit of soothing the skin, and keeping the bottles upside down reduces the chances of bubble formation in the bottles.^[12,13]
8. Transparent Hood- The hood is made of transparent acrylic material and is placed over patient's head and neck during the procedure.^[14] Refer Figures 3 and 4. The hood acts as a physical barrier preventing the

escape of any droplets from the patient or aerosols generated during the procedure. For maneuvering the laser or RF equipment 2 circular-shaped apertures have been created on all sides of the box, except for the front which is covered with the curtain made from thick polyester material preventing the escape of plumes. The apertures are lined by a polyester sheet on the inside which can be tightened over the wrist after doctors insert his/her hands through the aperture into the hood ensuring further added protection and complete seal. While conducting the procedure the hose of the smoke evacuator is passed through one of the apertures and the nozzle is placed near to the treating area [Figure 4]. One side two apertures are used by the treating dermatologist and the opposite is occupied by the staff nurse for assistance.^[15] After each procedure hood is cleaned using either 1% sodium hypochlorite solution or 70% isopropyl alcohol and allowed to dry for minimum 15 minutes before the next procedure.^[4] Conducting procedures in a well-ventilated room or room with exhaust (at least 12 exchange of air per hour) is encouraged.

Limitations of the hood include slight compromise in the visibility through the acrylic hood as compared to naked eye and difficulty in maneuvering during fine RF and laser procedures.

9. Smoke evacuator - Smoke evacuator equipped three stage filtering mechanism consisting of – high efficiency particulate air (HEPA) pre-filter, a layer of activated charcoal for odor absorption, and a third stage Ultra Low Penetration Air (ULPA) filter are considered currently the most effective filter for aerosol-generating procedures.^[16] The nozzle of the smoke evacuator is introduced through one of the apertures into the hood. The placement of the nozzle is crucial as the distance between the nozzle and treating area increases the efficacy of smoke evacuator decreases. A 2.2-cm wand when placed at a distance of 7.5 cm from the smoke source captured only 53% of the smoke in comparison to 99% capture when placed at 2.5 cm.^[17] The smoke evacuator is kept on inside the hood for at least 2 minutes after the procedure is over to vacuum any remaining plumes present.

To summarize, all these 9 measures can be divided into 4 P's—physician, patient, procedure, and place of procedure—and have been summarized in Table 1.

These measures are in addition to other sine qua non-measures being taken for COVID-19—social distancing, screening, mask, hand hygiene.

These methods show that with innovations that are simple and cheap, it is possible to overcome the challenges faced during procedures.

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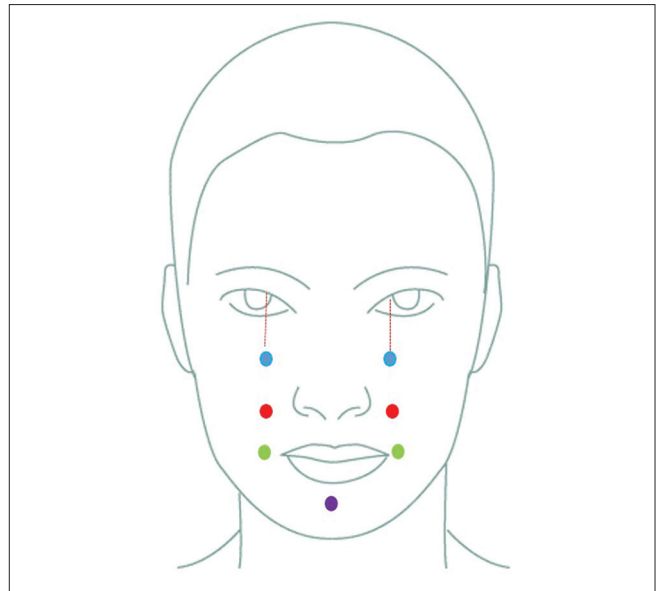


Figure 2: 1st point (blue dots) - upper edge of the mask in line with medial pupillary line (dotted red line). 2nd point (red dots) - on the outer edge of nasolabial fold at the level of the lower border of nasal alae. 3rd point (green dots) - 1 cm lateral to angle of mouth on both sides. 4th point (purple dot) —1 cm below mento-labial sulcus



Figure 3: Hood being used for laser toning of the face. Smoke evacuator nozzle (yellow arrow) and part of the hose is kept inside the hood near the area being treated



Figure 4: Hood from top view being used for laser toning of the face. Red arrow shows the laser handpiece. Smoke evacuator nozzle (yellow arrow). The patient is wearing nasal filter after betadine gargle and nasal spray

Conflicts of interest

There are no conflicts of interest.

Table 1: Tips can be divided into 4 Ps - Patient, physician, procedure, place of procedure

Level of protection	Measures	Comments
Patient	Betadine nasal spray	0.5% sol, 2 sprays in each nostril
	Betadine gargle	0.5% sol, 9 mL of sol, to keep in oropharynx for 30 s
	UVC chamber	Disinfection of personal belongings
Physician	Gloves for patient	Avoids cross-contamination and touching of face
	Mask	OPD - surgical mask + shield Non-aerosol procedures - N-95 mask + double gloves + apron (disposable) Aerosol procedures - N-95 mask+surgical mask + double gloves + Gown with head cover or PPE
	UV C chamber	Disinfection of personal belongings
Place of procedure	Well ventilated procedure room	At least 12 air exchange per hour with minimum staff and no attenders in room
	Smoke evacuator	HEPA/UPLA equipped filter Nozzle should be kept close to the area being treated
Procedure	Hood	All aerosol-generating procedures Clean with 70% isopropyl alcohol or 1% sodium hypochlorite after each patient, Gap of 15 min. minimum between procedures
	Cling film/gel/quartz slide	For plume generating laser procedures - As an interface between skin and laser probe

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