Letter to the Editor: Aerosol Box, An Operating Room Security Measure in COVID-19 Pandemic

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The article entitled, ‘*Aerosol box, An Operating Room Security Measure in COVID-19 Pandemic*’ by Levy Moraga et al., puts an interesting perspective on aerosol boxes [1]. Airway procedures like endotracheal intubation, extubation and front of neck access generate SARS-CoV-2-laden aerosols which remain in atmosphere and over surfaces for hours increasing the vulnerability of healthcare professionals to this frightful disease [2].

In order to reduce aerosolization, various precautions are taken. These include, reducing the doctors and staff present inside the theatres, regular sterilisation and disinfection, use of regional anaesthesia over general anaesthesia wherever possible and the use of personal protective equipment. To reduce contact with respiratory secretions, which contain bulk of the viral load, physical barriers, which act as an extra layer of protection, between the generated aerosols and OT staff are desirable [3].

Though it plays a pivotal role in preventing direct aerosolization into face of the proceduralist, there are certain limitations during the use of aerosol boxes, in the form of difficult manoeuvrability especially in patients with obese body habitus, short neck and difficult ergonomics. It can add the level of difficult in an already difficult airway and cause dental injury due to levering of laryngoscope during intubation [4]. The plexiform boxes are heavy and bulky. They also restrict hand movements and require training before use [1, 4]. At the end of the

procedure, the box itself forms a contaminated device which can cause infection if not properly handled and disinfected carefully.

To augment the efficacy of this device, various modifications have been proposed, in the form of detachable walls, use of ultraviolet light to ensure effective droplet containment and ports to allow oxygen delivery and nebulization of disinfectants for infection control [2].

The modification described by Cubillos et al. [2] is a rigid frame made of readily available material and plastic sheets covering which allows flexibility of movement while creating a negative airflow environment through continuous suction. Also, these sheets are disposable and care has to be taken only for the removal and doffing of these sheets and the frame.

Barrier enclosure devices have found use in other clinical procedures and specialties too, such as in gastro-intestinal endoscopies and bronchoscopies which are also high aerosol generating procedures.

This leads us to wonder if the use of these enclosures could be extended to allow restarting of laparoscopic procedures. Possibility of aerosolization of the virus after sudden release of trocar valves, through non-airtight exchange of instruments, by gas leak through the extraction incision site and through surgical plume has reduced the popularity of laparoscopy during the pandemic [5]. However, the benefits of laparoscopic surgery, such as decreased pain scores, early mobilization and decreased post-operative pulmonary complications, reduce hospital stay and thus reduce the possibility of in-house infection and increase the hospital turnover. Using enclosures which have suction devices, such as those mentioned by Cubillos, could help circumvent these risk factors, by allowing continuous elimination of infective aerosols [2]. Restarting laparoscopic and day care procedures may well be the key

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to coping with the backlog of elective surgical procedures due to the COVID-19 pandemic.

Personal communication (unpublished)

The authors work in an institute that has been using acrylic aerosol boxes since the pandemic started. We have successfully completed over 200 intubations using these. We find that there is an added level of difficulty when intubation with these boxes. Our institute has trainee anaesthesiologists, who were trained over mannekins before they used these boxes in actual patients. In spite of their training, the learning curve remained high.

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Compliance with ethical standards

Conflict of interest Authors declare that they have no conflict of interest.

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