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Простая модифицированная барьерная мера для управления дыхательными путями во время вспышки COVID-19

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РЕЗЮМЕ

Во время вспышки COVID-19 некоторым медицинским работникам, возможно, понадобится интубировать подозрительные или подтвержденные случаи в операционном блоке, отделении интенсивной терапии или кабинете неотложной помощи. Несмотря на то, что в некоторых странах имеются современные средства индивидуальной защиты (например, полностью покрывающие все тело плюс положительный очищающий воздух респиратор), это может быть экономической проблемой для стран с ограниченными ресурсами в других частях мира. Здесь мы предложили легкую, простую, практичную и недорогую меру по дальнейшему повышению безопасности для медицинских работников, осуществляющих управление инвазивными дыхательными путями в течение всего периода вспышки COVID-19.

КАК ЦИТИРОВАТЬ:

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A simple modified barrier measure for airway management during COVID-19 outbreak

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ABSTRACT

During the COVID-19 outbreak, some healthcare professionals might need to intubate the suspected or confirmed cases in the operation theatre, intensive care unit or emergency room. Although advanced personal protective equipment (e.g., whole-body coverage plus positive air-purifying respirator) are available in some countries, but it might be an economic issue for limited-resources countries in other parts of the world. Here we proposed an easy, simple, practical, and costless measure to further enhance the safety measure for the healthcare professionals conducting invasive airway management during the whole period of COVID-19 outbreak.

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During the COVID-19 outbreak, some healthcare professionals might need to intubate the suspected or confirmed cases in the operation theatre, intensive care unit or emergency room. Although advanced personal protective equipment (e.g., whole-body coverage plus positive air-purifying respirator) are available in some countries, but it might be an economic issue for limited-resources countries in other parts of the world. Here we proposed an easy, simple, practical, and costless measure to further enhance the safety measure for the healthcare professionals conducting invasive airway management during the whole period of COVID-19 outbreak.

First, the COVID-19 contracted patient should be put into proper sedation (with anesthesia induction agents) and adequate muscle relaxation (with neuromuscular blocking agents). Then, a piece of transparent and soft sizable plastic wrap (1 m X 1 m in size) is used to cover patient's head and upper trunk of body. This coverage could significantly reduce the chance of accidental splash of sputum, saliva, or secretion over the operator's face or body. Two separate small holes punctured through the plastic drape could be used to pass facial mask orifice connector, laryngeal mask airway (LMA) or intubating stylet. Using a facial mask underneath the plastic sheet, the operator could ventilate the patient easily without any mask seal problem (no leak) **(Fig. 1-A**, in a demo in mannequin and **Fig. 2-A**, in a patient). After the adequate depth of anesthesia is reached, either a LMA **(Fig. 1-B**, in mannequin) or video-assisted intubating stylet **(Fig. 1-C**, in mannequin; **Fig. 2-B**, in a patient) could easily be inserted, through the hole of the plastic wrap, into the patient's mouth and reach the airway destination (supraglottic or intratracheal location). Once the airway management is completed, the plastic sheet can be carefully rolled over, folded, and packed to avoid further contamination.

Here we would like to emphasize that this idea of plastic barrier has been checked in both the mannequin **(Fig. 1)** and the real-world scenario **(Fig. 2)**.

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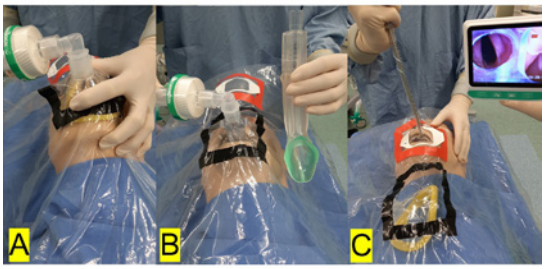

Fig. 1. **After patient's head and upper trunk at-risks region is covered by a sizable transparent and soft plastic warp, a conventional facial mask underneath the plastic sheet provides ventilation without leak problem (panel A). Subsequently, airway management is completed by either inserting a laryngeal mask (panel B) or a video-assisted intubating stylet (panel C) through a tiny hole of the plastic drape and secured into the patient's airway (supraglottic or intratracheal). This is a demo in mannequin.**

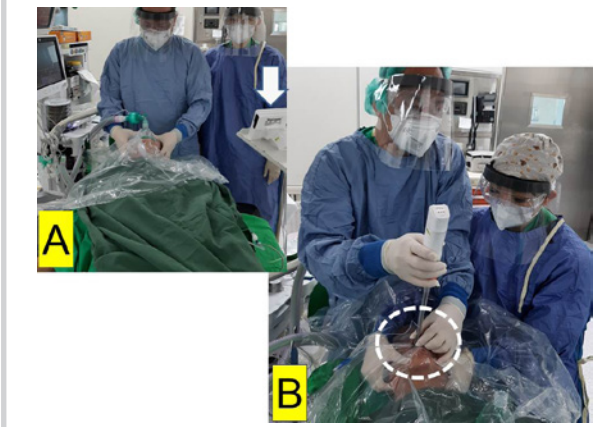

Fig. 2. **Routine use of plastic wrap in the real-world during COVID-19 outbreak. A conventional facial mask underneath the plastic sheet provided ventilation without leak problem (panel A). Subsequently, airway management was completed by inserting a video-assisted intubating stylet through a tiny hole of the plastic drape (panel B, white dotted line) and secured into the patient's airway. Intubation process was clearly visible shown in a wireless video monitor (arrow). This is a demo in a patient who received a routine surgical operation.**

We confirmed that the plastic sheet did not interfere facial mask ventilation at all **(Fig 1-A** and **Fig 2-A)**. In addition, by using a video-assisted intubating stylet, it was easy enough to pass the stylet/endotracheal tube through the tiny hole on the plastic sheet and smoothly reach the tracheal **(Fig 2-B**, white dotted line). Usually, the tracheal intubation procedure could be accomplished within 8 sec. During whole intubation process, a live imaging was clearly visible on a wireless video monitor to facilitate the procedure **(Fig 2-A**, arrow).

Such a piece of plastic sheet used as a barrier from contamination owns several features: disposable, small in size, light in weight, water-proof, easy to install, soft and flexible, clear visibility, no interference with airway manipulation, applicable for airway tools (facial mask, LMA, intubating stylet, or video-assisted laryngoscope), effective as a barrier from direct contact patient's face or body, cheap & affordable, and accessible. Medical resources are significantly limited and readily exhausted during COVID-19 outbreak and need a global integration, cooperation and innovation to help each other through this health crisis. A simple, feasible, and costless personal safety measure for anesthetists described above is therefore one of the examples.

The authors declare no conflicts of interest.

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