

Tracheostomies in Patients with SARS COV-2 Safety Protocol of the Head and Neck Equipment

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Abstract

Introduction: The SARS-CoV-2 virus appeared in the city of Wuhan, a province of Hubei in China, at the end of December 2019, as an outbreak of viral pneumonia because of a new type of coronavirus B, the was called COVID-19; later, officially, the virus will be declared as SARS-Cov-2. Head and neck surgeons perform tracheostomies in patients with CIVD-19, which results in increased aerosolization exposure. The present work aims to describe the surgical technique of open tracheostomy with adequate protection of the head and neck surgery team in patients with SAR-CoV-2.

Methods: This study was carried out at the La Trinidad Teaching Medical Center, in charge of the head and neck service. The multidisciplinary team was made up of head and neck surgeons, intensivists, and specialist nurses in the area. The technique was open tracheostomy in patients admitted to the intensive care unit with a positive result for SARS-CoV-2 infection, in the period between August 2020 to August 2021, after discussion with the multidisciplinary team and with the consent of the patient's relatives, ideally between the 15th and 21st.

Results: 14 open tracheostomies were performed; the first tracheostomy was performed on 01 / 08/2020 and the last one on 08/28/2021. All tracheostomies were performed in the intensive care unit. The medical staff was the minimum possible and consisted of: Head and neck surgeon, first and second assistant, scrub nurse, intensivist, intensive care resident and intensive care nurse. In all cases, proper hand hygiene and placement of personal protective equipment was carried out.

Conclusions: Keeping patients relaxed during the procedure, deflating the endotracheal tube cuff, and closing the circuit prior to the incision and quickly after the incision in the trachea and inserting the tracheostoma, connecting the closed-circuit system, seems to be a technique that preserves the safety of the surgical team.

Keywords: Tracheostomy; SARS-Cov-2; Head and Neck Surgeon

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Introduction

In the year 165 A.D., the Roman Empire dominated a good part of the known world and its borders extended to northern Europe, Africa, Britannia and towards Mesopotamia. Under the leadership of its emperor Marco Aurelio, Rome was a vast varied empire with about 50 million inhabitants. At that time the Roman army attacked the city of Seleucia (Iraq) under the command of General Lucio Vero, Roman Coemper. They say that a Roman soldier desecrated the temple of Apollo in Seleucia, from which a "pestilent fog" sprouted that began one of the great pandemics of history and that decimated the Roman Empire. The plague spread rapidly due to the movement of the army that returned from the East, largely due to the agglomeration. The epidemic did not respect social, economic rank, Emperor Marco Aurelio and Lucio Vero died because of it.

Pandemic conditioned by the SARS-COV-2 virus has infected more than one million human beings and has caused the death of more than one hundred thousand and continues to spread [1]. This virus appeared in the city of Wuhan, a province of Hubei in China, at the end of December 2019, as an outbreak of viral pneumonia consequence of a new type of coronavirus B, which was called Covid-19 (acronym for

English Coronavirus Disease); Subsequently, officially, the virus will be declared as Sars-COV-2. The SARS-COV-2 virus enters the guest cell, through the adhesion of S Ace2 cell receptors, this receiver is expressed mainly in epithelial cells of the lung, intestine, intestine, Kidney, heart, and blood vessels [2]. Its incubation period is two and up to 11 days, on average 6.4 days, according to reports from different countries it is recommended to consider an incubation period of up to 15.5 days. The diagnosis of SARS-COV-2 must be done with the studies of Polymerase chain reaction (CPR) [2].

The entity has as a primary shock organ to the lung, but it also has an important extrapulmonary involvement, impacting at the heart, gastrointestinal, hematological and coagulation level, as well as at the renal, dermatological, and central nervous system level, among others [1]. It is known That more than 80% of patients with COVID-19 have mild respiratory disease, while 17% develop severe COVID-19 with acute respiratory distress syndrome (ARDS), at least 10% require hospitalization in intensive care and around 3% require mechanical ventilation at some point in the course of their disease due to respiratory failure [3].

In patients with COVID-19 with prolonged endotracheal



intubation, tracheostomy can be useful, however, many doctors think that tracheostomy should be avoided, if possible, due to the risk that arises not only during the procedure, but also during the care process of patients [4]. A mortality rate of 2% is estimated, lower than other coronavirus epidemics (approximately 10% for SARS-COV and 40% for MERS-COV) but significantly higher than influenza pandemic to H1N1 2009 2009 (0.026%), according to data recently reported in Wuhan and Northern Italy. Surgical (open) tracheostomy is a spray generating procedure and entails a very high risk of contamination by exposing the secretions of respiratory tract to clinical staff involved. The general procedure must be planned completely and adequately and carefully executed to guarantee the safety of patient personnel [5,6].

It has been shown that the benefits of saving time and resources of Percutaneous tracheostomy becomes less evident when open tracheostomy is also performed next to the bed, indicating that the time and resources saved are more reflection of the environment than of the Head and neck surgeons perform tracheostomies in patients with COVID-19, which means greater exposure of aeration. The purpose of describing the surgical technique of open tracheostomy with the proper protection of the head and neck surgery equipment in patients with SARS-COV-2.

Material and Methods

This study was carried out at the La Trinidad Teaching Medical Center, in charge of the head and neck service. The multidisciplinary team was made up of head and neck surgeons, intensivists and specialist nurses of the area. Tracheostomies were due to open technique in patients who were admitted to the Intensive Care Unit (ICU) with a positive result of SARS-COV-2 infection in chain reaction analysis of the swab sampling polymerase, in the period Between August 2020 to August 2021, prior discussion with the multidisciplinary team and with the consent of the patient's relatives, ideally, between day 15 and 21.

Results

14 open tracheotomies were performed, the first tracheostomy was carried out on 08/01/2020 and last 08/28/2021.

Multidisciplinary Place and Team

All tracheostomies were performed in the Intensive Therapy Unit.



Figure 1: Representation of the intensive care cubicle and the qualification.

The medical staff was the minimum possible and consists of head and neck surgeon, first and second assistant, instrumentalist, intensivist, resident of intensive care and intensive therapy nurse.

Surgical equipment: Head and neck surgeon, First assistant, Second assistant, Surgical instrumentalist with a head and neck.

Intensive therapy team: Intensive Guard Therapy Specialist, Resident of Intensive Guard Therapy.

Nursing team: Coordinator of Nursing on Guard, Bachelor of Guard Nursing.

Personal Protective Equipment

In all cases the proper hand hygiene and placement of the personal protective equipment consisting of: hair covers, mask N95 and 4 strips, complete facial protector, overalls, resistant batters, footwear protection, double glove with and at the end of the withdrawal of the protection team under supervision.

Materials

- Electric scalpel.
- 2 Fronto Luz.
- Subscapular roll.
- Sterile gauze.
- Chlorhexidine soap.
- Sterile fields.
- Sterile physiological solution.
- Equipment that consists of: dissections with teeth and without teeth, senn Miller separators, labor dilator, needle holder, straight crille and suction cannula.
- Non-absorbable monofilament suture.
- Tracheostomo.

Technique

The patient should be sedated during the duration of the procedure and the closed suction system connected to the endotracheal tube before surgery. The preparation with the subscapular roll is indispensable and the endotracheal tube and the oral cavity had to be covered and that only the intensivist.

I could access them to allow maneuvers during tracheostomy. The incision made in leather was transverse, not greater than 1.5 cm, with electric scalpel, dissecting the midline to the trachea and exposing it. Monofilament sutures were placed in the upper and lower tracheal ring to the place where the incision of the trachea would be.

Proper hemostasis is crucial, since coagulation anomalies are not uncommon in these patients. Closed circuit aspiration systems with antiviral filter were always used. Once the trachea was referred, the intensivist was indicated to approach the patient's head to be able closed-circuit system.

The incision in trachea was horizontal, among the tracheal rings. This is a critical step since the patient has a risk of loss of alveolar recruitment and may require aggressive recruitment after inflating the sleeve again. During the surgical manipulation of the trachea the airway with gauze was protected on the oral cavity.



A second tracheostoma must be available in case of malfunction, as well as a larger size and a smaller size, if necessary and previously corroborated the proper functioning of the sleeve. After inserting the tracheostoma and connecting, the CO₂ stroke of the Capnography was confirmed. The tracheostoma was fixed with spinners and made a final cure.

The surgical team of head and neck surgery was not positive for SARS-COV-2 in the period of the present study, or at the end of this.



Figure 2: Team during the procedure.

Discussion

As of December 2019, a new coronavirus (SARS-COV-2) has caused an international outbreak of acute respiratory disease called COVID-19. It is an RNA virus, of positive, monocatenary chain, spherically that on its surface projects protein spicules, which in electronic microscopy resemble the solar crown., It is classified as belonging to the nestviridae order, Coronaviridae family, four types are identified: Alfa, Beta, Gamma, and Delta 2.

Until now, there are no therapeutic agents and, in some patients, endotracheal intubation and mechanical ventilation are common and indispensable treatments to save lives. It is estimated that it has a lethality rate of 2% [1]. The entity has as a primary organ to the lung [3]. Tracheostomy is required in 10.7% of patients with mechanical ventilation admitted to intensive therapy units 5. In general, it is suggested to consider tracheostomy in patients with COVID-19 in which a substantial benefit is expected to obtain, evaluating the high infectious risk to which the equipment is exposed and ideally, should be done 21 days after intubation [3]. Yeung E, et al. (2020) [8], In its center, which is made up of oral surgeons and Maxillofacial, exclusively provide open tracheostomy and due to the high volume of cases, together with the limitations of resources, resulted in an exceptionally high number of open tracheostomies [9,10].

Broderick D, et al. (2020) [6], They framed the procedure in 5 main domains that include: Theater, Team Informative Meeting, Patient Transfer, Tracheostomy Procedure and wear and summary of the equipment. They considered that there are important modifications in the tracheostomy procedure that can (and must) apply to minimize the risk of viral transmission. They called them "critical steps": suction of the endotracheal tube, adequate muscle relaxation, suction of the oral cavity and coverage only accessible to the anesthetist to allow maneuvers during the tracheostomy, maintain a closed circuit until the tracheostomy tube is inserted into the trachea and prior to carrying the tracheal window, ask the anesthetist to stop the fan and deflate the ball/sleeve [6].

The present work was maintained to the patients relaxed during the procedure and once the trachea was referred, it was indicated to the intensivist to approach the patient's head. The tube was removed and the tracheostoma was placed quickly connecting it to the closed circuit system.

Zhang X, et al. (2020) [5], obesity, enlarged thyroid, scar contracture of the neck, etc.) and in these cases conventional open tracheostomy is an inevitable choice. According to their optimized protocol for conventional open tracheostomy, the operators performed conventional open tracheostomy under general anesthesia with the application of muscle relaxants, in order to avoid the reflection of patients during surgery, the anesthesiologists helped to move the endotracheal tube near the carina and this action makes the sleeve are deeper than the site of the incision to prevent sleeve leakage due to accidental damage of it when the tracheal opening is made. When carrying out the tracheal opening,

A brief fan pause is made; therefore, the safety of health workers can be achieved during open tracheostomy [5].

The surgical team with a head and neck when opening the trachea and with the help of the intensivist in bed header, suggested the fan pause and thus reduce the airline. During all the procedures this step was carried out routinely, although it cannot be demonstrated statistically, it could be a safety margin for the personnel, since none of the surgical team was positive during the entire execution time of the various tracheostomies and even the closure of this work.

The benefits of bed tracheostomy include avoiding exposure to additional health workers during the transfer to the operating conserve more effectively the livelihoods compared to tracheostomy in the operating room [8].

Conclusions

The Covid-19 pandemic has unique challenges when considering a tracheostomy, first, for the prognosis, because the disease is not yet completely understood and second, because the mortality rates in critical care are around 50%. Head and neck surgeons must perform and participate in exams and procedures within the head and neck region and respiratory tract that carry a particularly high risk of exposure and infection, due to the role of airline during high-risk procedures, in particular the COVID-19 tracheostomy, which is currently in demand due to the increase in income in the intensive care unit. The tracheostomy is required in 10.7% of patients in mechanical ventilation entered into the intensive therapy units and it is suggested to consider it in patients with COVID-19 in which a benefit is expected and it is advisable to perform it after 21 days of intubation. Keep patients relaxed during the procedure, deflate the mushy of the endotracheal tube and close the circuit prior to the incision and quickly after the incision in trachea, insert the tracheostomy connecting it to the closed-circuit system, it seems to be a technique that preserves the safety of the surgical equipment.

Declarations

The authors declare that they have no conflicts of interest, that the work has been approved by the ethics committee responsible in the workplace, and do not declare means of financing of the work carried out.

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