

Tracheostomy on a COVID-19 Patient: Case report and Review of Literature

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ABSTRACT:

A new respiratory illness the severe acute respiratory virus (Sars Cov2), was identified at the beginning of the new decade 2020.

Severe cases present with respiratory distress and tracheostomy has been considered to play a role in their management.

We present a report of a Tracheostomy performed on a Covid-19 patient and also a review of the relevant literature.

A 62 year old man, was brought in on a transport ventilator with a endotracheal tube insitu. From a private clinic after testing positive for COVID-19.

While on admission he desaturated further and subsequently had a tracheostomy done with marked improvement of the oxygen saturation immediate post operative period.

However on the day following the tracheostomy, he desaturated suddenly, resuscitation was commenced immediately but proved abortive, Patient was later certified dead.

Despite the unfavourable outcome, we believe the decision to perform the tracheostomy offered the patient a chance at survival.

KEY WORDS Covid-19, Respiratory Distress, Tracheostomy, Saturation.

Introduction.

The beginning of the new decade 2020 saw the world aghast at the outbreak of a new respiratory illness, known as the Severe acute respiratory virus 2 (Sars Cov 2) or the Corona Virus Disease 2019 (COVID-19) due to the fact that it was first isolated in December, 2019.

Transmission was initially thought to be zoonotic from animals to man as it was thought to have originated from the seafood market in Wuhan China, then later it became human to human transmission principally via respiratory droplets.

As at early August 2020, over 20 million cases had been reported worldwide with over 700,000 deaths. In Nigeria over 45,000 cases reported with 930 deaths and in Delta State Nigeria, about over 1,500 cases and 43 deaths¹.

Severe cases of COVID-19 most commonly present with respiratory distress/failure and Tracheostomy has been considered to play a role in the management of these severe COVID-19 cases.

We present our experience, which to the best of our knowledge is the index COVID 19 tracheostomy reported in sub-Saharan Africa because as at the time of publishing we could not find any report in the literature.

Case report.

Mr. P.K a 62years old retiree was rushed into the COVID 19 isolation and treatment facility of Delta State University Teaching Hospital (DELSUTH), Oghara with a history of testing positive to COVID 19 2 days prior to presentation.

He was said to have had symptoms similar to malaria including malaise, fever and headache, about 3weeks prior to presentation. He started self-medicating on anti-malarials, however symptoms worsened. He soon developed difficulty in breathing. He subsequently presented to a private hospital in Warri metropolis where he was advised to be screened for COVID 19. The test turned out positive and he was subsequently isolated. Shortly, his respiratory distress worsened necessitating intubation. He was subsequently transferred to treatment and isolation centre for COVID 19.

He was a known hypertensive and diabetic both poorly controlled.

At presentation, he was morbidly obese, restless on endotracheal intubation being mechanically ventilated in an ambulance. SPO₂ was 88-90%. Temp 39.5°C, BP 147/60mmhg, HR 120bpm. Blood investigation results showed WBC of 15,200, PCV 32%, Hb 12g/dl, RBS 156mg/dl. He was commenced on ventilator support with setting of PEEP – 5. FiO₂ 100%, tidal volume 600mls. SPO₂ was 100%. Chest X ray reported cardiomegaly but was otherwise normal.

He was also commenced on other medications which included Tabs Chloroquine 500mg dly. He was also placed on midazolam infusion, infusion morphine, IV Ranitidine, sc clexane, TED stocking and tabs vasoprin 75mg dly and sc insulin.

On second day on admission, his SPO₂ dropped to 91 – 93%, Bp 117/80mmhg, PR 104b/m. urine output was about 21mL/hr. FBS was 210mg/dl. He was to continue other management but to tail off sedation.

Third day on admission, he became aggressive, pulled off his central line, urethral catheter and NG tube. Other setting remained the same while SPO₂ ranging between 92 -94%.

On day four, he desaturated further with SPO₂ down to 78 80%. RBS 235mg/dl

By day 5, his condition worsened with SPO₂ ranging from 54 – 70%. PR 109b/m, BP 139/78mmhg. A decision was made to perform a tracheostomy for improved suctioning which was expected to improve the Patient's saturation.

He subsequently had a tracheostomy done and a size 7.5mm cuffed tracheostomy tube inserted thereafter he was properly suctioned.

For the tracheostomy, it was done inside the isolation ward where there was no negative pressure and this further increased the risk to the surgical team, all team members wore goggles, face shields and Hazmat

suits before putting on the surgical gowns. Team members were buddy checked afterwards and the surgery was meticulously planned to reduce the amount of time spent in the contaminated room.

On entry into the room, because the patient was morbidly obese and there were inadequate personnel, it took about 15 – 20 minutes to properly position him and get relevant materials ready.

A horizontal skin crease incision was used and a bleeder was encountered which further prolonged the surgery time.

After dissection, before opening the trachea patient was well oxygenated and ventilated. Ventilation was stopped temporarily whilst opening, trachea was quickly opened and the anaesthetist informed to withdraw ETT, tube was inserted, cuff inflated and circuit quickly connected back, tracheostomy tube was sutured to the skin as well as held with straps. Sutures were placed over the incision and dressing applied, surgical time due to the earlier mentioned reasons was about 1hour 10 minutes instead of the projected 30 – 40 minutes.

All team members had been trained on donning and doffing of the PPE's and subsequently went through the doffing process.

The SPO2 improved to 93-95% immediate post-operative period. Other treatment continued.

On day 6 following admission, he was noticed to desaturated suddenly and then stopped breathing. Resuscitation was commenced immediately but proved abortive. Patient was declared dead by 3.20am.

Cause of death was Acute respiratory distress syndrome complicated by Sepsis.

Secondary cause of death was COVID-19.

It is important to note that none of the team members showed any symptoms 2 weeks after or tested Positive to COVID-19

Figure 1 Chest X-ray done on Day 4

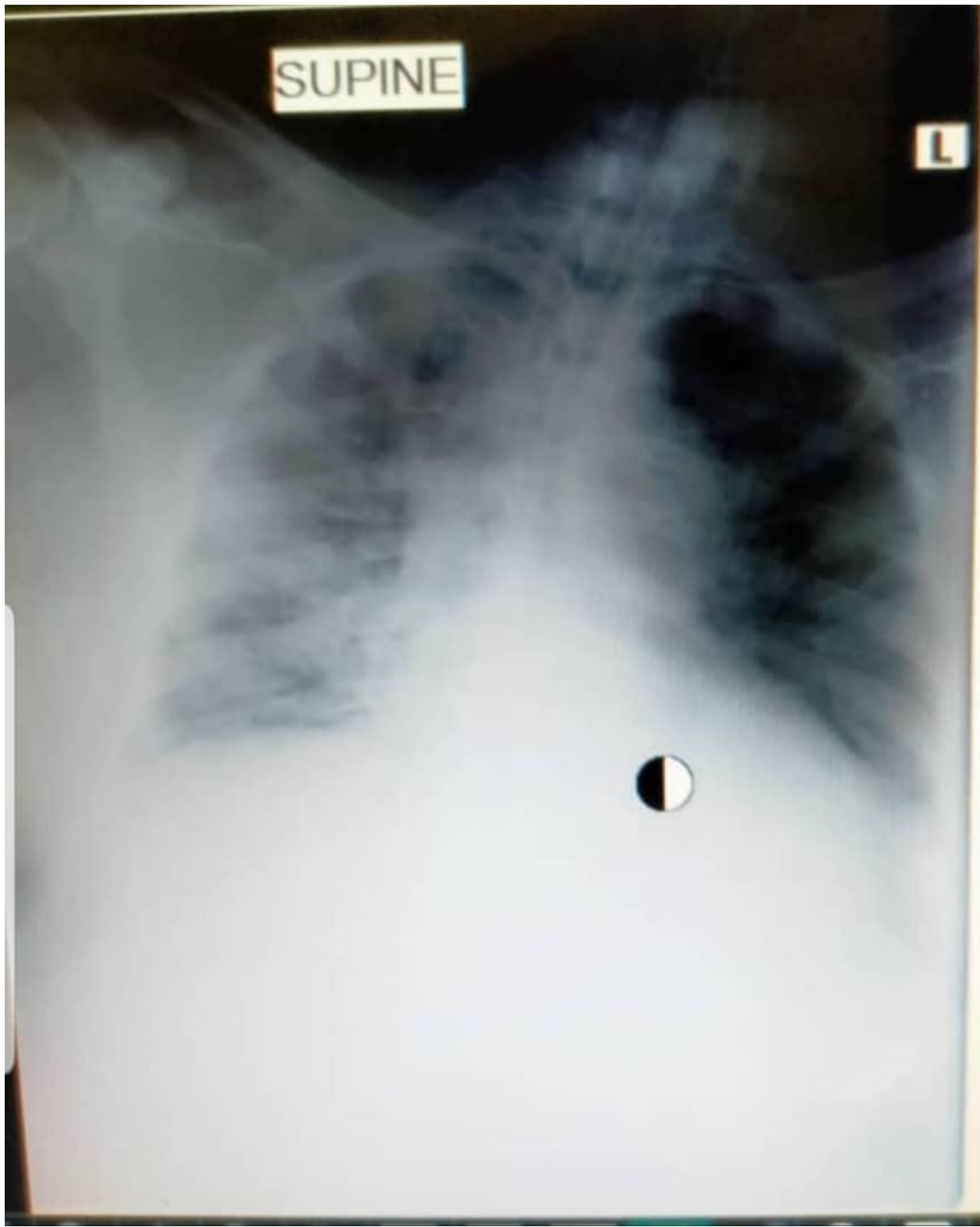




Figure 2: Open Surgical tracheostomy at the Covid-19 Ward.



Figure 3: Surgical Team Comprising the Chief Consultant Surgeon, Senior Resident, Anaesthesiologist and Theatre Nurse

Discussion.

Tracheostomy in COVID 19 even though it is a novel disease so far has been highly controversial, though there is a paucity of literature on this for obvious reasons, to the best of our knowledge this is the index tracheostomy reported in sub Saharan Africa on a COVID- 19 patient, the surgery was performed on the 12th June 2020.

Controversies remain on the right indications for tracheostomy in COVID-19 positive patient as well as timing for the surgery^{2,3}

There is little evidence in the literature for the recommended timing for tracheostomy in COVID 19 related respiratory failure. Some authors recommend 21 days after onset of symptoms to reduce the hazard to the surgical team or at least 14 days after the patient has been placed on a ventilator. However when the need is urgent these guidelines would not suffice^{3,4}

Our Surgery was done on the 8th day after the patient had been intubated and placed on a ventilator.

There are also controversies whether early tracheostomy can lead to early withdrawal from a ventilatory support.^{5,6} It is agreed though that the removal of endotracheal intubation increases the comfort of patients, reduces an anatomical dead space, decreases the need for sedatives and helps keep them conscious⁷.

Early tracheostomy is also thought to reduce sedation requirements and make patients more comfortable.

Our patient had 10 ampoules of midazolam and 10 ampoules of morphine in 48 hours.

In a resource challenged economy this is not ideal.

For the indications of tracheostomy in COVID-19 patients, one indication is when prolonged ventilation is required or to assist in weaning patients off the ventilator.

It has been found that about 20-30% of Covid-19 patients will require ICU care of these, about 8% will require ventilator support. Some of these patients might then end up with unsuccessful extubation and in these patients as well as those in which there is prolonged ventilator support, a tracheostomy is also said to be indicated⁴.

In managing severe Covid-19 patients, intubation and ventilatory support are essential in maintaining their vital signs. However it has been observed that this may not effectively facilitate the discharge of sputum and this may then affect the patency of the airway which will be clogged with viscid secretions and in this condition a tracheostomy has been suggested.^{7,8}

Our indications for Tracheostomy in this patient was two-fold,

Firstly it was thought that retained secretions were the major reason for the worsening level of oxygen saturation in this patient as a chest x-ray done prior to this only suggested hypertensive changes to the heart (See Figure 1), it was thus expected that a tracheostomy would facilitate the removal of these secretions. This was confirmed when post tracheostomy the oxygen saturation level improved from from pre-op values of 54-70% to 93-95% post operatively,

Secondly a tracheostomy was expected to reduce the requirements for sedation in this patient, as noted earlier this patient had 10 ampoules of Midazolam and 10 ampoules of morphine in 48 hours. This was also expected to make the Patient more comfortable as well.

Tracheostomy is considered to be an aerosol generating procedure and one of the high risk COVID-19 surgeries. Thus it poses a great risk to health care worker, it is recommended to be carried out in a negative pressure room and the recommended technique is either an open surgical tracheostomy or a percutaneous dilational tracheostomy^{3,4}.

In our case we used the open surgical tracheostomy. Our choice of open surgical tracheostomy was based on the fact that our patient was morbidly obese and had a short neck, leaving open surgical tracheostomy as the only option. The room used for surgery was not a negative pressure room hence increasing the risks to the surgical team, see Figure 2. It has been recommended that a skilled team which will make for faster surgery time and more efficiency be used and hence the Chief Consultant as well as a Senior Resident were the surgeons in this case⁹ See Figure 3.

Post surgery. The saturation markedly, improved from 54 – 70% to between 93 -95% afterwards. However it should be noted that patient was a 62 year old patient with uncontrolled diabetes and uncontrolled hypertension. He was also morbidly obese with acute kidney injury and sepsis, the presence of all these co-morbidities led the patient to succumb to his illness the next day after surgery

For the Surgery, it has been suggested that Anaesthesiologist, Otolaryngologists and Intensivists agree on indication and timing of tracheostomy⁹.

In our case, indeed the entire Covid-19 response team consisting of the Case Managers, the IPC team, the ENT Surgeon, the Anaesthetists and the Intensivists had a clinical conference on this patient where the indications and risks were reviewed and the decision taken to perform the tracheostomy was made.

For the Surgical procedure it is recommended that there is sedative anaesthesia and muscle relaxants are used during the surgery to suppress the cough reflex, thus reducing aerosol generation and reducing risk to surgical personnel^{8,10} This was done in our case and was considered helpful.

Conclusion

Despite the unfavourable outcome in this case, we believe that the decision to have the tracheostomy done offered the patient a chance at survival, the patient's co-morbidities which were Diabetes, Hypertension, Obesity as well as the AKI and sepsis would also have contributed to the unfavourable outcome.

We also believe that his chances would have improved with bedside post-operative nursing at the immediate post-operative period. We suggest that this should be taken in consideration in pre-operative planning in the future.

References.

1. Nigeria Centre for Disease Control. An update of COVID-19 Outbreak in Nigeria. 08.20
2. Elvir Z, Ljubica R, Vladimir P.
Tracheostomy in a patient with COVID-19 a case report,
Journal of Surgical case report. 2020 6;6:194.
3. Miles BA, Schiff B, Ganly I, OwT, Coher E, Geidei E.
Tracheostomy during SARS-COV-2 pandemic: Recommendations from the New York Head and Neck Society. Head Neck. 2020;42(6):1282 – 1290.
4. Aissaoui O, Nsiri A, Fehd, MA, Mouhaoui M Alharrar R.
Surgical tracheostomy in Covid-19 patients: report of 5 cases, Pan African Medical Journal, 2020; 35(2): 55.
5. Chiesa – Estomba CM, Lechien JR, Calvo – Henriquez C, Fakhry N, Karkos PD,Peer S et al.
Systematic review of international guidelines for tracheostomy in COVID-19 patients. Otolaryngology, preprint. 2020.
6. Lombardi A, Bozzi G, Mangioni D, Muscatello A, Peri AM, Tarramasso L et al
Duration of quarantine in hospitalized patient with severe acute respiratory syndrome Corona virus 2 (SARS – COV- 2) Infection: a question needing an answer.
J Hosp Infect. 2020.03.003.
7. Marraro GA, Spada C.
Consideration of the respiratory support strategy of severe acute respiratory failure caused by SARS COV – 2 infection in children.
Zhongguo Dang Dai Er ke Za Zhi, 2020; 22(3): 183 – 194.

8. Xiaomeng Z, Qiling H, Xun N, Tao Z, Zhen X, Y, Z, Hongjun X.
Safe and Effective Management of tracheostomy in COVID -19 patients. *Head and Neck* 2020; 42: 1374 – 1381.
9. Carla RL, Neeraj RD, Luis A, Udit C, Ashutosh S, Sonali S et al
Use of tracheostomy During the COVID – 19 Pandemic
Chest 2020 doi:10.1016/j.chest.2020.05.571
10. Xiao H, Zhong Y, Zhang X, Cai F, Varvares MA.
How to avoid Nosocomial spread during tracheostomy for COVID – 19 patients. *Head Neck* 2020
<https://doi.org/10.1002/hed>. 26167.