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Case Report

Post-Covid tracheal resection – first case in India

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ABSTRACT

Background: Prolonged intubations result in tracheal damage and stenosis, the treatment for severe cases is resection and anastomosis. With the progress of the Covid-19 pandemic, this incidence kept rising but the timing and precautions for such aerosolising surgeries remained unclear.

Aim: To report the first case of tracheal resection and anastomosis in India done during the Covid-19 pandemic along with its rationale.

Materials and Methods: We report a case of 30/male with prolonged intubation and tracheostomy done for Covid-19 pneumonia and ARDS with failure to decannulate and complete loss of voice. After thorough preoperative work-up, he underwent tracheal resection of 4 rings with cricotracheal anastomosis during the covid-19 pandemic in October 2020.

Results: He was extubated on table and was asymptomatic after 3 months of follow-up with excellent voice.

Conclusion: With good team effort and appropriate precautions, aerosolising airway surgeries resection anastomosis can be safely performed.

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1. Introduction

Tracheal resection is the surgery for severe Tracheal stenosis after prolonged intubation.¹ However during early months of covid-19 pandemic, the safety and rationale behind it was not established. We report the first case of tracheal resection with cricotracheal anastomosis in India done during the pandemic along with the precautions and preparation for the same.

2. Case History

30/male, known Diabetic, presented to the airway clinic with h/o failed decannulation since 5 months. He gave h/o admission to ICU with Covid-19 pneumonia with ARDS in

Kuwait where he was intubated with 7.0 cuffed ET tube on 15/05/2020 and kept on ventilator for 16 days after which an elective tracheostomy was done on 01/06/2020 in the ICU with 7.0 cuffed Tracheostomy tube insertion. After recovery there was failure to decannulate and he came back to India in September 2020.

On examination, he had no voice but could eat without coughing. He had 7.0 cuffed tube in situ.

On 25/09/2020 - He underwent a flexible Laryngotracheoscopy under local anaesthesia. Findings – Both vocal cords were mobile. Grade IV tracheal stenosis at the 1st tracheal ring (according to Cotton-Myer's classification).² Stoma was healthy with 14 infrastomal healthy rings below (Figure 1). Then a direct laryngotracheoscopy was done under GA which confirmed the above findings.

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The surgical plan was primary tracheal resection with cricotracheal anastomosis with extubation on table. However, due to the ongoing covid-19 pandemic, several factors like the timing of surgery, risk of anaesthesia, post-operative complications and added risk to health-care workers were discussed in a multi-speciality meet with the physician, chest physician and intensivist and anaesthetist.

He underwent additional preoperative investigations i.e. Six-minute walk test, Breath holding test, Arterial blood gas analysis, Covid-19 antibodies, repeat tracheal culture and High resolution CT scan of the chest.

On 29/10/2020 - Under full Covid-19 precautions with PPE, 3-ply mask, face shield, anti-fogging goggles, double gloves and shoe cover for the entire team (Two surgeons, one staff nurse, one anaesthetist, one OT technician) the patient was induced with sevoflurane, IV propofol and IV atracurium. Nasogastric tube was passed through Right nostril. A 7.0 cuffed flexometallic tube was introduced through the sterile stoma. Elliptical incision around the stoma was taken. Subplatysmal flaps were elevated from hyoid to suprasternal notch. Laryngeal framework was exposed to reveal bottle-necking just below the cricoid upto 2 rings below the stoma. He underwent tracheal resection of 4 rings (around 3.5cms in length). Distal mobilisation of normal tracheal rings was along with a mini-laryngeal drop to regain good length for anastomosis. A cuffed 6.5 sized ET tube was passed through the Left nostril and nasotracheal intubation was done. After completing the posterior anastomosis with 4-0 vicryl interrupted sutured, the nasotracheal tube was glided down the distal stump and flexo-metallic tube was withdrawn. Anaesthesia circuit was changed. Care was taken to prevent air leak and aerosolization. Crico-tracheal anastomosis was completed anteriorly with 3-0 vicryl interrupted sutures. There was no air leak on Valsalva Tissue glue was used to cover the anastomosis. Closure in layers over a corrugated drain was done. During surgery, he maintained saturation well and was extubated on table under effect of Fentanyl to prevent coughing. His face was covered under a transparent plastic sheath. On extubation, he had good voice and no stridor. He was kept in the ICU for 1st postoperative day with strict neck flexion and observation for respiratory distress then transferred to the ward. Daily dressings with all precautions were done. NG tube was removed on Day-5 and oral feeds were started. Drain was removed on Day-8. On Day-10, he underwent flexible laryngoscopy under local anaesthesia which showed healing anastomosis with no granulations and fibrin.

His check scopy was done after 3 months showed well healed anastomosis (Figure 2).

3. Discussion

Tracheal stenosis is a well-known complication of prolonged intubation with an overall incidence of 6%



Fig. 1: Preoperative endoscopy picture with Grade IV Tracheal stenosis just below the cricoid



Fig. 2: Postoperative endoscopy picture after 3 months with well healed anastomosis

– 21%.²In the background of the ongoing Covid-19 pandemic where number of intubations in the ICU have increased significantly, it is predicted that the positive pressure ventilation required in these patients with subsequent intubation and later tracheostomy along with the inflammation of the airway for vasculitis phenomena may increase the rate of tracheal injuries and stenosis.³ Giacomo Fiachhini et al published that more than 50% of the Covid-19 pneumonia patients with prolonged intubation developed full thickness tracheal lesion and/or trachea-esophageal fistula.⁴

When this 30/male presented to us, there were multiple factors to be considered prior to surgery.

1. Timing of surgery – There was no other published case of Elective tracheal resection during the pandemic. The only article published was from North Italy where a resection-anastomosis was done for an emergency patient in stridor with Grade III stenosis.⁵
2. Possibility of post-operative systemic complications in recovered Covid-19 patients – residual pulmonary dysfunction, lingering arterial and venous embolic phenomena, adrenal insufficiency from steroid overuse, myocardial dysfunction, neurological manifestations and also residual neuromuscular weakness in critically ill patients was reported.⁶
3. Uncertainty of post-symptomatic infectious phase.⁷
4. Possibility of recurrent Covid-19 infection in the same patient.⁸

A multi-disciplinary team comprising of physician, chest physician, anaesthetist and intensivists discussed the case with the airway surgical team.

Room air ABG was >95%. Breath holding was >30 seconds. Six-minute walk test spO₂ was 96%. ABG was normal. High resolution chest CT revealed no active lesions. All these findings suggested good pulmonary function. Coagulation profile and 2D-Echocardiogram was normal. There was no neurological deficit.

Covid-19 Total antibodies were positive suggesting old infection with residual immunity. Repeat RT-PCR was done which was negative. All these factors were favourable for the patient. Also, patient and relatives were counselled in detail about possibility of recurrent infection in future and high-risk nature of surgery. The patient gave due consent understanding that there was no other medical or surgical option to regain his voice and hence, his employment. Tracheal culture was sent which revealed *Pseudomonas* sensitive to Inj. Colistin. Under appropriate antibiotic cover for 5 days, patient was taken up for the surgery with all precautions including full PPE donned by the entire team. Surgical steps remained same as for non-covid tracheal stenosis cases.⁸ Extra care was taken during anaesthesia tube exchange and extubation. Post-operative course was uneventful and follow-up after 3 months did not reveal any long-term Covid related pulmonary or airway complications.

4. Conclusion

We report the first case of tracheal resection and anastomosis done in India during the peak of the pandemic with relative safety and good success. This was possible due to rigorous preoperative work-up, multi-disciplinary

team discussion, detailed counselling of the patient and appropriate peri-operative precautions for the safety of the patient as well as the hospital staff.

5. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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None.

References

1. Grillo HC, Donahue DM, Mathisen DJ, Wain JC, Wright CD. Postintubation tracheal stenosis. Treatment and results. *J Thorac Cardiovasc Surg.* 1995;109(3):486–92. doi:10.1016/S0022-5223(95)70279-2.
2. Sarper A, Ayten A, Eser I, Ozbudak O, Demircan A. Tracheal stenosis after tracheostomy or intubation: review with special regard to cause and management. *Tex Heart Inst J.* 2005;32(2):154–8.
3. Lucchi M, Ambrogi M, Aprile V, Ribechini A, Fontanini G. Laryngotracheal resection for a post-tracheotomy stenosis in a patient with coronavirus disease 2019 (COVID-19). *JTCVS Tech.* 2020;4:360–4. doi:10.1016/j.xjtc.2020.08.023.
4. Fiacchini G, Tricò D, Ribechini A. Evaluation of the Incidence and Potential Mechanisms of Tracheal Complications in Patients With COVID-19. *JAMA Otolaryngol Head Neck Surg.* 2021;147(1):70–6. doi:10.1001/jamaoto.2020.4148.
5. Gervasio CF, Averono G, Robioli L, Bertoletti M, Colageo U, Col LD, et al. Tracheal Stenosis After Tracheostomy for Mechanical Ventilation in COVID-19 Pneumonia - A Report of 2 Cases from Northern Italy. *Am J Case Rep.* 2020;21:e926731. doi:10.12659/AJCR.926731.
6. Anesthetic Considerations for Recovered COVID-19 Patients. *J Cardiothorac Vasc Anesth.* 2021;35(2):376–7. doi:10.1053/j.jvca.2020.10.032.
7. Thyagarajan R, Mondy K. Timing of surgery after recovery from coronavirus disease 2019 (COVID-19) infection. *Infect Control Hosp Epidemiol.* 2021;42(6):790–1. doi:10.1017/ice.2020.325.
8. Gousseff M, Penot P, Gallay L, Batisse D, Benech N, Bouiller K, et al. Clinical recurrences of COVID-19 symptoms after recovery: Viral relapse, reinfection or inflammatory rebound? *J Infect.* 2020;81(5):816–46. doi:10.1016/j.jinf.2020.06.073.

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