

Cost Effective Percutaneous Tracheostomy an Indian Hack- Hospital Based Study

Dr Krishna Murty¹, Dr Sanjay Pandey²

¹(Surgery Department, Subharti Medical College/Subharti University, INDIA)

¹(Surgery Department, Subharti Medical College/Subharti University, INDIA)

Corresponding author – dr Krishna murty

Abstract: Tracheostomy is a life saving procedure that is done in ICU's. it reduces both the mortality and morbidity of patients. Slowly percutaneous tracheostomy (PCT) is becoming common in hospitals catering to population of middle economic class. The major concern is related to the high cost of marketed PCT kits. We performed PCT in 40 patients in ICU in an innovative way with results similar to PCT done with standard kits thereby reducing the cost of the patient from approximately ₹ 8000/- to ₹ 500/-
Our technique is now followed as a standard technique for all PCT's done in our hospital.

Date of Submission: 30-06-2020

Date of Acceptance: 16-07-2020

I. Introduction

Tracheostomy is one of the oldest and most commonly performed procedures in critically sick patients. Surgical tracheostomy was first described by Jackson in 1909. Percutaneous dilatational tracheostomy (PDT) over a guidewire was invented by Ciaglia in 1985. PDT has now become the standard of care in ICU and has replaced open tracheostomy. Despite advantages of PDT it remains under performed as compared to open due to many reasons. In our setup where the majority of the patients are from lower middle and lower economic status, one of the major reason is the cost of the PDT kits that are available. We started with an innovative way of performing PDT while bypassing the cost issue. We called it the 'Indian Hack' or 'Jugad' method.

II. Material And Methods

We have the capability to perform open tracheostomy and per cutaneous tracheotomy at the ICU bedside and have all appropriate equipment, including headlights, operating room, portable electrocautery, and surgical tracheostomy trays. Ethylene oxide machine(ETO) is used for sterilization.

Instrument used under Indian hack image below: (*Left To Right*)

1. 5ml syringes for local anesthesia (2% lignocaine with adrenaline)
2. Surgical blade no.11(sterilized from center venous line)
3. 16 gauge needle(easily available at ICU setup)
4. A Guide wire (sterilized from center venous line)
5. Dilator(sterilized from center venous line)
6. Long curved artery forceps
7. Per cutaneous tube



Operative Procedure

1. After an indication for tracheostomy is established informed consent for the procedure is taken.
2. Sensitivity to local is checked
3. The patient position is prepared with extension at neck, the neck is painted with ethylalcohol and allowed to dry. Then povidone iodine is used and the neck draped.
4. The neck is palpated, cricoid cartilage and sternal notch are identified, skin between this region is anesthetized with 2% lidocaine with 1; 200,000 adrenaline solution.
5. A 1.5- to 2-cm midline transverse cutaneous incision is made, about 2 fingerbreaths above the sterna notch
6. A 16-gauge IV needle with syringe half filled with saline is inserted in the midline of the incision. The needle is directed to pass between the first and second or the second and third tracheal rings. As soon as the syringe enters the trachea air begins to bubble into the syringe. Care is taken not to advance the needle too deep once the trachea is entered.
7. a guidewire is passed through the needle and introduced in trachea, and the needle is removed.
8. Next A dilator is used to dilate the path over the guidewire.
9. A long artery forceps is used for dissecting along the guidewire towards the tracheal rings till resistance is felt to give way and a tracheostomy stoma is created by opening the forceps up to the size of cutaneous incision.
10. A per cutaneous type of cuffed tracheostomy tube with obturator is introduced over the guide wire and advanced into trachea.. The obturator and guidewire are removed, the cuff of the tracheotomy tube is inflated, and the appropriate breathing circuit is connected.

Post Operative

- Air entry into the lungs is checked by chest auscultation
- Excess secretions or blood should be suctioned to prevent a drop in oxygen saturation and to provide good hygiene.
- The tube is fixed to skin.

Below (figure1-5) show the sequence and method for per cutaneous tracheostomy by Indian hack kit.



FIG-1



FIG-2



FIG-3



FIG-4



III. Result

Total (n=40) patient underwent per cutaneous tracheostomy in our hospital by Indian hack kit and there was no intra or post tracheostomy complication in any of the patient. No increased rate of infection was observed.

IV. Discussion

We performed per cutaneous tracheostomy in ICU patients by using an innovative way so that it is very cost effective for patient of lower socio economic status and thus could be practiced at large if found to be safe and feasible. Total (n=40) patient underwent per cutaneous tracheostomy in our hospital by Indian hack kit and there was no intra or post tracheostomy complication in any of the patient. No increased rate of infection was observed.

1. the guidewire and dilator were recycled from a Central line kit that had been used. It was preserved after the central line was placed. After the procedure was over both were cleaned thoroughly under running water to remove any visible blood or debris. Syringe was used to clean the dilator and gloved hand with guaze piece for the guide wire and outer part of dilator. Both were then sent to CSSD for ETO sterilization that is performed in our setup on Saturdays. These were then collected on day of procedure in sterile containers.
2. Rest of the material ie. Syringes, blade, artery forceps are available in all setups.
3. Percutaneous type of tracheostomy tube was the major cause of the cost in this technique and we are making efforts to innovative a way around this so that a normal tracheostomy tube that is atleast 5 times cheaper than this can be used.
4. 16 G needle used is also readily available. One of the complications we faced was that some times in patients with copious tracheal secretions air could not be aspirated initially but aspiration of secretions marked the confirmation of position.
5. No problem was faced with the insertion of guide wire and dilator. Circular motion of the dilator over the guidewire was necessary to pass through the tracheal membrane.
6. Step involving the use of curved artery forceps was the most demanding and needed about 2-3 cases to be mastered. In the first 2 cases we used a guide-wire-dilating forceps from one of the older kits that was sterilized be autoclaving but then successfully used curved medium artery forceps in all patients.

V. Conclusion

1. Indian hack kit is safe to use and cost effective as compared to the classical PDT.
2. Indian hack kit is easily available, affordable and assessable in an ICU setup hospital .
3. This method may be used to replace the classical PDT for patients of all socioeconomic class like it has done in our setup.