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# THE DILEMMA OF TRACHEOSTOMY DECANNULATION IN A 3- MONTH -OLD BABY: CONVERSION OF AN ENDOTRACHEAL TUBE TO A TRACHEOSTOMY TUBE IN A RESOURCE CONSTRAINT ENVIRONMENT.

By

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**ABSTRACT**

**Background**

Non-availability of medical consumables is a challenge in sub-Saharan Africa. Difficult weaning of a child off tracheostomy is illustrated in this case.

**Case report**

A 3- month- old female with meningomyelocoele and hydrocephalus presented in Children Emergency with features of aspiration pneumonitis. She had urgent endotracheal intubation, bronchial toileting, and antibiotics at the intensive care unit.

Features of upper airway obstruction persisted after unsuccessful efforts at tracheal extubation. She had a temporary tracheostomy with a size 4.0 ID non-cuffed polyvinyl chloride (PVC) tracheostomy tube on the 12th day. Subsequently, she had ventriculo-peritoneal (V-P) shunt and repair of meningomyelocoele, on the 14th day.

On the 30th day, decannulation became challenging due to non-availability of k8smaller sizes of tracheostomy tubes to facilitate weaning. A size 3.0 ID PVC endotracheal was improvised (preformed) into a tracheostomy tube. Decannulation was successful after 72 hours-

**Conclusion**

In this situation, available human resource is compelled to make the best of available types of equipment.

**Key Words**: Upper Airway Obstruction, Endotracheal tube, Temporary Tracheostomy, Improvised (preformed) tracheostomy tubes,Decannulation

## Case Presentation

A 3 month old baby was seen in the emergency room with a history of aspiration of recently ingested food and choking. Baby was delivered in the same facility with myelomeningocoele and was subsequently lost to follow up. After resuscitation, endotracheal intubation, tracheo- bronchial toileting and parenteral antibiotics, her clinical state improved. Efforts at extubation 6 days after failed; as the features of upper airway obstruction persisted. A surgical airway with a size 4mm tracheostomy tube was put in place after 12 days to replace endotracheal intubation; to facilitate tracheo-bronchial suctioning

In view of an associated finding of hydrocephalus made at this presentation, the baby was prepared for ventriculoperitoneal (VP) shunt insertion and myelomeningocoele repair. Both surgeries were done concurrently with good outcome.

Postoperatively, she had episodes of tonic –clonic seizures which were controlled by syrup carbamazepine 15mg daily and was administered through a feeding tube.

Her haemoglobin concentration increased from 7gm/dl to 12gm/dl after transfusion, with compatible O rhesus positive blood. Intravenous ceftazidime 250mg 12hourly and 50mg ciprofloxacin 12hourly were continued till the 21st day on account of persistently raised white cell count.

When she became more stable on the 30th day, attempt at decannulating the tracheostomy and replacing with serial smaller sizes was not possible because of non-availability. An invention of tracheostomy by cutting sizes 3.0mm and 3.5mm non-cuffed polyvinyl endotracheal tubes; reducing the length at the connector side, leaving the beveled end intact, and replacing back the connector to the cut end was used. A copper stylet was inserted into the tube, bent to shapeand then boiled in water for 30minutes at 100 $^{0}$C.It was allowed to cool after which the copper stylet was removed, thereby creating a preformed tracheostomy tube. The baby was successfully decannulated in 72hrs after inserting the improvised "size 3.00mm tracheostomy tube".

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**Discussion**

Sourcing medical disposables in Africa can sometimes be a herculean task; especially when they are not produced locally [1, 2]. Tracheostomy tubes, especially sizes not frequently used, get expired often on the shelves of marketers; who subsequently limit their products to adult sizes that have a higher turnover rate and better profit on the long haul. This creates a situation where the sizes not commonly used get out of stock because of low volume purchases. Often times, they are not stocked at all.

Tracheostomy tubes can be made of silicone, polyvinyl chloride (PVC) or metal. They come in different shapes that can be customized to the need of the patient. They could also be angled or curved (cuffed or non-cuffed) [3,4,5] .They come with flanges (neck plate) and tapes to help secure the tubes around the neck. A neck plate arises from the sides of the factory-made tracheostomy tube and has holes through which tapes or strapping are attached around the neck. For tracheostomy tubes of these sizes (3.5mm, 3.0mm), not commonly used, non-availability can pose serious threat to life. In this instance efforts to get these proved abortive. We had to make use of available resources- a size 3.0mm internal diameter PVC endotracheal tube (figure 6- boiled and preformed), improvised as a tracheostomy tube. This helped to facilitate weaning and decannulation. Gladly this was successful.

Instances exist in literature where endotracheal tubes were used for emergency tracheostomy as interim life-saving tool until appropriate size of tracheostomy tubes are available [6]. In this scenario, the risks of extubation was always present [7]. The problems of tracheal irritation was rife especially in conscious patients, since the required curvature of the tube was absent. Heating of the PVC endotracheal tube in a preset shape with a copper stylet in boiling water at 100°C gave us the angled shape required. The absence of the flanges in the endotracheal tube; ( unlike in the factory purpose made tracheostomy tube), made it mandatory to tie the knot at the back of the neck after applying opposite traction on the connector. This was further strapped down with plaster. Patency of the tube and curvature were sustained.

"Tracheostomy" suctioning was not affected with the use of an appropriate-sized suction catheter. Close patient monitoring was ensured to avoid hypoxia from blockage of the tube and dislodgement.

She was successfully decannulated 72 hours after stepping down from a size 4.0mm tracheostomy tube to a size 3.0mm preformed. Tracheostomy tube decannulation can be done in several ways [8, 9, 10, 11, 12].This can be done by deflating the tracheostomy cuff and allowing patient to breath after occlusion of the tube at safe intervals until patient is comfortably breathing through the nostrils. Close monitoring of oxygen saturation is advised: a single step removal of tracheostomy is done. In children sometimes, multiple serial steps of decannulation with gradual reduction in tracheostomy tube size is advised until breathing through the nostrils is comfortable and safe. In this patient the step down in tube size was the safest option as the other modality failed

**Conclusion**

The successful decannulation in this patient in the midst of grave necessity is not an unusual event faced by surgeons practicing in resource constrained environment. A situation where available human resource is compelled to make the best of minimally available equipment and disposables.

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