IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 14, Issue 3 Ser. 1 (May. – June. 2025), PP 63-66
www.iosrjournals.org

Early V/S Late Tracheostomy Placement on Outcome of Neurosurgical Patients a Retrospective Study

Dini C Davis[1], Gayathri.I.V[2], Sunita mitchel Domingo[3] ,Mini Jose[4], Dr Yagna Munesh Gali[5], Dr Munshi Intekhab Alam[6]

[1](Assistant Nursing Superintendent,Apollo Hospitals Jubileehills) , [2](Diabetic Educator Apollo Hospitals Jubileehills),[3] (Regional nursing director apollo Telangana region),[4] (Nursing Superintendent, Apollo Hospitals Jubileehills), [5](Neuro critical care consultant Apollo Hospitals Jubileehills) ,[6](Junior consultant critical care Apollo Hospitals Jubileehills,)

Abstract:
Introduction.
Tracheostomy is a surgical procedure whereby an external artificial opening is made in the trachea. Tracheostomy can help weaning in long-term ventilated patients, reducing the duration of mechanical ventilation and intensive care unit length of stay, and decreasing complications from prolonged tracheal intubation.(1) In Neurological patients, ideal timing for tracheostomy is still debated. We performed a systematic review and meta-analysis to evaluate the effects of timing (early vs. late) of tracheostomy on mortality and incidence of VAP in neurological patients.
Methods. *This was a retrospective interventional study conducted at the Neurocritical Care Centre, Apollo Hospital, Jubilee Hills, between September 2023 and February 2024. Institutional Ethics Committee approval was obtained prior to commencement. The study included patients who underwent tracheostomy and received post-operative care, provided they gave informed consent for participation.*
A total of 100 patients who underwent tracheostomy for various indications during the study period were enrolled. All patients were thoroughly assessed through detailed history taking and physical examination. Radiological investigations, including chest and neck X-rays, and CT scans of the head and neck, were performed as clinically indicated.
Post-operative management involved meticulous care, including but not limited to humidification, regular tracheal suctioning, cuff management, tracheostomy wound care, and close monitoring. Patients were followed up until decannulation was successfully achieved.
Keywords: *Acute brain injury, early tracheostomy, late tracheostomy, tracheostomy timing*

Date of Submission: 04-05-2025 Date of Acceptance: 15-05-2025

I. Introduction

Neurological disorders encompass a broad range of conditions that affect the central nervous system, potentially resulting in temporary or permanent deficits in physical, cognitive, and psychosocial functions. In patients with neurological disorders, endotracheal intubation is frequently required to ensure airway patency and prevent hypoxia, particularly in cases of impaired respiratory control or airway obstruction.(2,8,10)

Early tracheostomy, if no serious attempt was made to wean the patient from the ventilators (tracheostomy based only on clinical or laboratory results and performed from two days to 5 days after intubation).(3,10)

Late tracheostomy, If weaning from mechanical ventilation is unsuccessful or delayed beyond 5 days after endotracheal intubation, a tracheostomy may be considered. The term "trachea" originates from the Greek word tracheia arteria, meaning "rough artery," which refers to the windpipe. Tracheostomy involves creating and maintaining an external communication with the trachea, allowing for a secure airway.(3,8)

Historically, tracheostomy was considered a high-risk procedure and was rarely performed until the mid-19th century. (3)Initially, it was primarily indicated for relieving upper airway obstruction. However, its indications have expanded to include cases of head and chest trauma, as well as other conditions where the patient is unable to maintain adequate respiratory function or control secretions, leading to compromised respiratory efficiency. Such conditions include severe respiratory distress, sleep apnea syndrome, and terminal malignancies.(5,9)

Over the past few decades, the frequency of tracheostomy procedures has increased, correlating with a rise in complications. These complications may arise due to various factors, including the nature of the procedure (elective vs. emergent), the patient's age and overall health, the urgency of the intervention, the surgeon's

expertise, and the timing of the procedure. Additionally, postoperative care plays a significant role in minimizing risks.(2,7)

Post-tracheostomy care requires a skilled, experienced healthcare team, advanced medical equipment, and considerable time and financial resources. Awareness and prompt recognition of potential complications are essential, as early intervention can prevent prolonged morbidity and suffering(6,9,10).

The objective of the present study was to examine the various indications for tracheostomy, the complications associated with the procedure, and to compare elective versus emergency tracheostomies. Additionally, the study aimed to evaluate the postoperative management strategies implemented in tracheostomy care.

II. Discussion

OBSERVATION AND RESULTS:-

It was observed that patients who underwent early tracheostomy were more readily weaned from mechanical ventilation compared to those who received tracheostomy at a later stage. Additionally, patients who underwent early tracheostomy had a shorter length of ICU stay compared to those who had the procedure after 7 days. Our systematic review demonstrated that early tracheostomy was associated with improvements in three major clinical outcomes: reduced incidence of ventilator-associated pneumonia (VAP), increased ventilator-free days, and shortened ICU stay. These findings suggest that early tracheostomy (≤7 days) may reduce the incidence of VAP(11). Moreover, we observed a reduction in ICU length of stay in patients who underwent early tracheostomy placement. Early tracheostomy may facilitate more efficient weaning from the ventilator and potentially increase the availability of ICU resources, including ICU beds, mechanical ventilators, and clinical staff.

Primary outcomes

Among these patients, the data demonstrated a reduction in both the mortality rate and the duration of artificial ventilation.

Secondary outcomes

1. Length of stay in ICU (or frequency of tracheostomy at any time point).
2. Ventilator- associated pneumonia at any time point.
3. Laryngotracheal lesions at any time point (in epiglottis, vocal cord, larynx; subglottic ulceration and inflammation; stenosis).

This study demonstrates that early tracheostomy is associated with a reduced length of ICU stay and facilitates a more efficient weaning process in patients. A total of 100 patients were included in the study, and the outcomes of early tracheostomy were found to be superior to those of late tracheostomy, particularly in terms of complications. Specifically, the incidence of ventilator-associated pneumonia (VAP) was lower in patients who underwent early tracheostomy. The results indicate that out of the 100 patients, 96 underwent early tracheostomy, and the average length of stay (ALOS) in the ICU was significantly reduced for these patients.

TABLE 1 INDICATING DISTRIBUTION OF PATIENT GROUP A AND GROUP B

GROUP A		**GROUP B**	
AGE(20-40)	20	AGE(40-80)	80
GENDER(F:M)	08:12	GENDER(F:M)	24:56

TABLE 2: INDICATORS USED FOR DATA COLLECTION

CONTENTS	NO
TOTAL PERCUTANEOUS TRACHEOSTOMY	100
EARLY TRACHEOSTOMY	68
LATE TRACHEOSTOMY	32
TOTAL MECHANICAL VENTILLATOR CASES	100
TOTAL MECHANICAL VENTILLATOR CASES DAYS	430
TOTAL ICU STAY DAYS	910
TOTAL DISEASED CASES	12

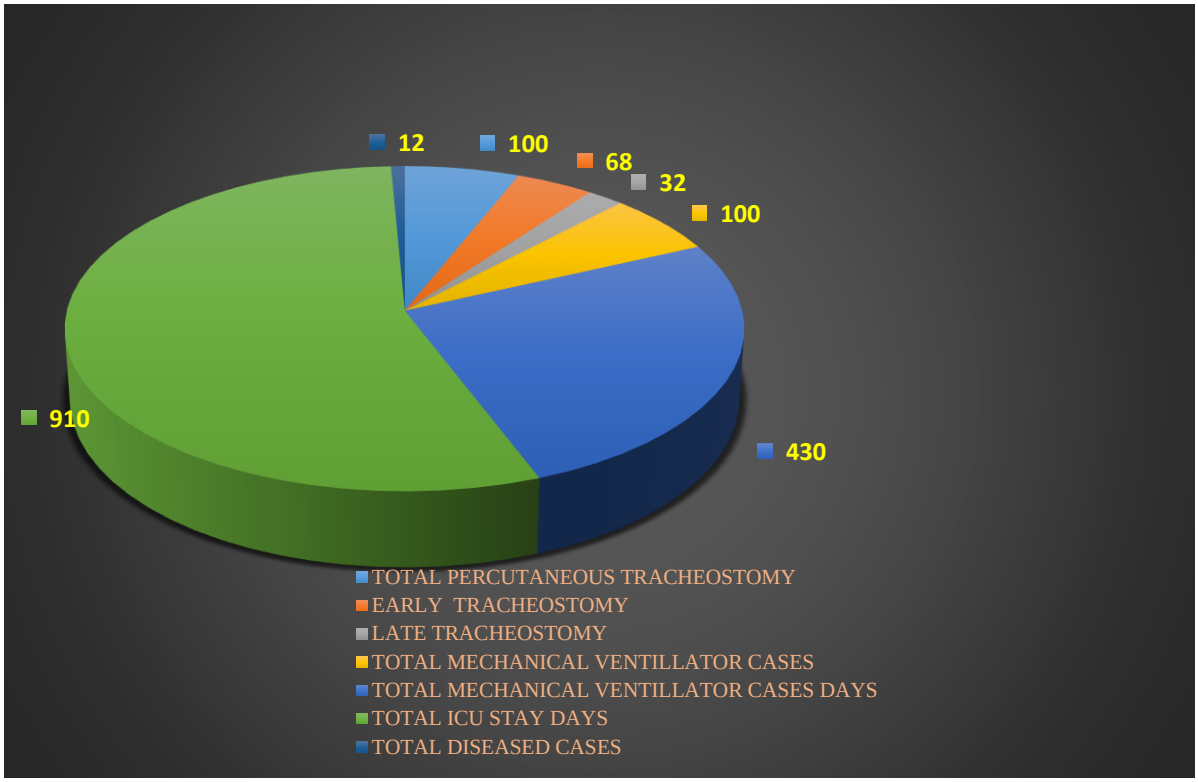

TABLE 3: CASES INCLUDED FOR STUDY

DIAGNOSIS	TOTAL CASES
TOTAL PERCUTANEOUS TRACHEOSTOMY	100
TRAUMATIC BRAIN INJURY	19
C3,C6 DECOMPRESSION	6
MYASTHENIA GRAVIS	11
ACUTE POSTERIOR CIRCULATION STROKE	12
RIGHT FRONTAL ANTERIOR 1/3RD FALCINE TRANSITIONAL MENINGIOMA	3
HYPOGLYCAEMIC ENCEPHALOPATHY	21
LEFT OCCIPITAL LOBE HEMORRHAGIC CONTUSION	3
SEPTIC AND METABOLIC ENCEPHALOPATHY	1
LEFT THALAMIC BLEED WITH IVH	2
RIGHT MCA TERRITOTY INFARCT	12
DIFFUSE SUBARACHNOID HAEMORRHAGE	3
RIGHT SUPRACLINOID ANEURYSM RUPTURE	2
SPONTANEOUS SAH(FISHER GRADE-4)	2
ACUTE RIGHT CAPSULOGANGLIONIC HAEMATOMA WITH INTRAVENTRICULAR HAEMORRHAGE WITH MASS EFFECT	3

The study demonstrates a significant reduction in the incidence of ventilator-associated pneumonia (VAP), with the rate decreasing from 12% to 3%. Additionally, the average length of stay (ALOS) in the ICU was reduced from 42% to 18%. Overall, the infection rate decreased, and the ALOS was significantly shortened. Furthermore, early transfer from the ICU and the discharge rate of patients improved, indicating a more favorable clinical outcome for those who underwent early tracheostomy.

III. Conclusion

The results of various studies on tracheostomy are challenging to interpret due to the heterogeneity in patient demographics, admitting diagnoses, indications for the procedure, techniques employed, and the timing of early versus late tracheostomy. In our study, we observed that a low Glasgow Coma Scale (GCS) score was the predominant indication for tracheostomy in the endotracheal (ET) group. Furthermore, no significant difference in mortality was observed between the percutaneous and surgical techniques for performing tracheostomy.

Through a systematic review and meta-analysis, we evaluated whether clinical outcomes differed between early and late tracheostomy in critically ill adults. Our combined analysis revealed that early tracheostomy was associated with reduced ventilator-associated pneumonia (VAP) incidence, shorter duration of mechanical ventilation, and fewer ICU days, but did not significantly impact short-term all-cause mortality. These findings may have implications for current clinical practices and may influence ICU and surgical guidelines regarding the optimal timing for tracheostomy placement.

Conflicts of interest

There are no conflicts of interest.

Reference

[1]. American Association for Respiratory Care. AARC clinical practice guideline: Nasotracheal suctioning - 2004 revision & update. Respiratory Care. 2004;49(9):1080–1084. https://www.aarc.org/wp-content/uploads/2014/08/09.04.1080.pdf

[2]. Early vs. Late Tracheostomy in Patients with Traumatic Brain Injury: Systematic Review and MetaAnalysisNATIONALLIBRAROFMEDICINEhttps://pmc.ncbi.nlm.nih.gov/articles/PMC8348593/.

[3]. Andriolo BNG, et al. Early versus late tracheostomy for critically ill patients. Cochrane Database Syst Rev. 2015;1(1):CD007271. doi: 10.1002/14651858.CD007271.pub3.

[4]. Durbin CG., Jr Indications for and timing of tracheostomy. Respir Care. 2005;50(4):483–487

[5]. Early Tracheostomy in Severe Traumatic Brain Injury Patients: A Meta-Analysis and Comparison With Late Tracheostomy,CRITICAL CARE MEDICINE JOURNAL,SOCIETY OF CRITICALCAREMEDICINE

[6]. Mohamed A, Yehia A, Samir A. Early versus late percutaneous tracheostomy in critically ill adult mechanically ventilated patients. *Egypt J Chest Dis Tuberc*

[7]. Hosokawa K, Nishimura M, Egi M, Vincent JL. Timing of tracheotomy in ICU patients: a systematic review of randomized controlled trials. *Crit Care*. 2015;19(1):424. doi:10.1186/s13054-015-1138-8

[8]. Honnagouda Patil. To assess the knowledge regarding Tracheostomy Care among the Staff Nurses working at KLES Dr. Prabhakar Kore Hospital and MRC, Belgaum, Karnataka with a view to develop Information booklet on Tracheostomy Care. Int. J. Adv. Nur. Management. 2016; 4(3): 299-306. doi: 10.5958/2454-2660.2016.00054.5https://ijneronline.com/AbstractView.aspx?PID=2016-4-3-8

[9]. *Mandeep Kaur Dhaliwal, Rashmi Choudhary, Poonam Sharma. A Descriptive Study to assess the knowledge and skills on tracheostomy care among staff nurses working in selected hospitals of district Mohali, Punjab. Asian J. Nursing Education and Research. 2018; 8(2): 242-246. doi: 10.5958/2349-2996.2018.00049.*

[10]. *Bhartendra Sharma. A Quasi-Experimental Study to Assess the Effect of Video Assisted Teaching Module Regarding Tracheostomy Care on Knowledge and Skill of Staff Nurses at Vinayaka Mission Hospital, Salem, Tamilnadu. Research J. Pharm. and Tech. 7(7): July 2014 Page 737-742.* https://rjptonline.org/AbstractView.aspx?PID=2014-7-7-11

[11]. *Sailaja Busi, Ramanjamma. K.*DOI: *10.5958/2454-2652.2016.00028.7*, International Journal of Advances in Nursing Managementhttps://ijanm.com/AbstractView.aspx?PID=2016-4-2-8