International Journal of Otorhinolaryngology
2026, Vol. 12, No. 1, pp. 20–24
https://doi.org/10.11648/j.ijo.20261201.14

Review Article

Indication of Tracheotomy in the ENT department of the Gabriel Toure University Hospital

Soumaoro Siaka, Kone Fatogoma Issa*, Cisse Naouma, Maurinne Kenne, Dicko Ibrahim, Diarra Kassim, Konate N'faly, Ouane Aissata, Coulibaly Assitan Kole, Doumbia Salimou, Konate Oumar, Bah Famagan, Traore Youssouf Traore, Boubacary Guindo, Singare Kadidiatou, Keita Mohamed Amadou

Faculty of Medicine, University Hospital Gabriel Toure, Bamako, Mali

Abstract

Introduction: Tracheostomy is the opening of the cervical trachea followed by the placement of a cannula. It is intended to provide a short circuit of the upper airway. The aim of this study is to review the indications for tracheostomy. Materials and methods: This is a retrospective study of 43 tracheotomized patients treated in the otorhinolaryngology department of Gabriel University Hospital. Toure de Bamako for a period of 6 years from January 2017 to August 2024. Results: The work involved 27 men (62.8%) and 16 women (37.2%), with a sex ratio of 1.69. The mean age of the patients was 38.295 years with extremes of 2.67 and 77 years. Laryngeal dyspnoea (n= 28) and dysphonia (n=26) were the main symptoms of consultation. Most tracheostomies were performed as an emergency procedure in 79.1% of cases (n=34), with scheduled tracheostomies performed in 20.9% of cases (n=9). The conditions requiring tracheostomy were dominated by malignant tumours of the larynx and pharynx (26.4%), followed by post-thyroidectomy recurrent paralysis (7.9%), trauma to the larynx (10.5%) and penetrating neck wounds (4.7%). Laryngeal papillomatosis was the main indication in children (4 children). The technique used was classical surgical tracheotomy, often performed under general anaesthesia (53.5%) and under local anaesthesia in emergency cases (46.5%). The skin incision was transverse in most cases (n=38) (88.4%) and vertical in 11.6% (n=5). Complications related to tracheostomy were diverse, generally benign, and occurred in 1% of cases. Mortality occurred in 3 of our patients whose cannulas were still in place, a rate of 8.1% (n=3). Conclusion: Whatever the indication, tracheostomy is a life-saving procedure whose usefulness and effectiveness are certain. Mastery of the technique, rigorous monitoring and postoperative care are the main conditions for minimising the risk of complications.

Keywords

Neck, Trachea, Risk Factors, Tracheotomy, Skin, ENT, Treatment, Indication

*Correspondence: Kone Fatogoma Issa (konefatogomaissa@yahoo.fr)

Received: 2 April 2026; **Accepted:** 16 April 2026; **Published:** 28 April 2026

1. Introduction

Tracheostomy is the opening of the cervical trachea followed by the placement of a cannula [1, 2]. It is intended to provide a short circuit of the upper airway [1, 2]. Once an emergency surgical procedure codified by Chevalier Jackson, it is now a controlled procedure, performed in the majority of cases on a patient with tracheal intubation [1]. It maintains the safety of the upper airway, provides oxygenation and allows for long-term mechanical ventilation of patients. The crescendo in the survival rate of infants, preterm infants, and patients with congenital anomalies is due to the diversification of the indications for tracheostomy [1]. Inherent to tracheostomy, complications occur in three periods: preoperative, early postoperative and late postoperative. Our center is a surgical center that is called upon by various departments for the management of dyspnoea, in intensive care and in the operating theatre for ventilatory problems in an intubated patient or for difficult intubation for head and neck disease. The small number of studies on tracheostomy in our center is an obstacle to rationalising its indications. The occurrence of different complications due to tracheostomy is a source of exploitation opening up fields of research. The increasing number of upper airway affections in our context led us to review the indications and main complications identified in our context through a retrospective study of 70 files of tracheotomized patients at the Gabriel Touré University Hospital over a period of six years from January 2015 to December 2020. The aim was to study the indications for tracheostomy.

2. Methodology

2.1. Study Design

This is a descriptive observational study of case series type with retrospective collection. Our study took place in the Department of Otolaryngology (ENT) and Cervico-Facial Surgery (CCF) of the Gabriel Touré University Hospital over a period of 6 years, from January 2017 to August 2024.

2.2. Study Setting and Population

Tracheostomized patients in the ENT department of the Gabriel Touré University Hospital Center

2.3. Population

We included all patients who underwent a tracheotomy in the ENT department of the Gabriel Touré University Hospital. These patients had complete medical records.

2.4. Sampling

Patients with tracheostomies in other departments. Patients with incomplete records. Sampling was carried out exhaustively and covered 43 patients.

2.5. Variables

Data collection was carried out on a form using patient records and operative reports.

The main information collected for each patient included:

1) Socio-demographic data
2) The reason for consultation and hospitalisation precisely for laryngeal dyspnoea: its mode of onset and the classification of Chevalier Jackson and Pineau
3) Background
4) Physical signs in the neck
5) General condition
6) Indirect laryngoscopy
7) Nasofibroscopy
8) Data from endoscopy, cervical CT, histology and other examinations.
9) Medical and surgical treatment aspects

2.6. Analysis and Data Entry

Statistical analysis was carried out using SPSS software version 22, Word and Excel 2016. The results were expressed as mean plus or minus standard deviation (for quantitative variables) or as a percentage. A simple descriptive analysis was performed on the entire study population. This description covered epidemiological, clinical, and evolutionary data.

2.7. Ethical Considerations

Respect for anonymity was taken into consideration during data collection, in accordance with the rules of medical ethics.

Finally, we conducted a literature search and compared our results, wherever possible, with those already published in the literature.

3. Results

Our study focused on 43 tracheotomized patients in the ENT department of the Gabriel Touré University Hospital. During the study period we recorded 43 cases of tracheostomy, i.e. an annual average of 7.17 tracheostomies. The average age of our study population was 38.295 ±19.779 with extremes of 2.67 and 77 years. The most represented age group was over 39 years with 48.9%. We counted 27 male patients and 16 female patients with a sex ratio of 1.69. The liberal profession was the most represented with a frequency of 25.6%. Laryngeal dyspnea was the most common symptom with 88.3% of cases, followed by dysphonia with 60.5% and dysphagia with 51.2%. On physical examination, cervical swelling accounted for 37.2% of patients, signs of struggle for about 7%. There

were no cases of cardiorespiratory arrest, signs of hypoxia or disturbed consciousness. The indications were dominated by respiratory distress with 28 cases or 65.1%. Tracheotomy was a life-saving procedure for paroxysmal respiratory failure. Pharyngeal and laryngeal cancers were the predominant underlying pathologies (Table I) with 10 cases or 26.4%. This was followed by traumatic neck pathologies with 7 cases (18.4%) and bilateral post-thyroidectomy recurrent paralysis with 3 cases (7.9%). In our study, tracheostomy was performed as an emergency procedure in 34 patients (79.07%) and as a scheduled procedure in 9 patients (20.93%). Local anaesthesia was used in 46.51% of cases. The skin incision was transverse in 88.37% and vertical in 11.63%. Throughout our study, the cannulas used were low pressure balloon cannulas. It was held in place by bands wrapped around the neck, this cannula was changed in the majority of cases with a PVC cannula. Post-operative follow-up was simple in 38 patients (88.4%). Decanulation was performed in 22 patients (51.2%) with an average of 32.53 ± 40.054 days, with extremes of 7 and 181 days. The delay of decanulation was short in children. The tracheostomy was definitive with a tracheal connection to the skin (tracheostomy) in patients with laryngeal cancer who underwent a total laryngectomy with lymph node dissection.

4. Discussion

The indications for tracheotomy are varied [3]. It remains a life-saving procedure for paroxysmal respiratory failure. Respiratory distress was the main indication with 88.3%. The recrudescence of tumoral pathologies, especially of the aerodigestive lives, remains a reality, this observation was noted by certain authors with a respective predominance of pharyngeal and laryngeal tumours at 40%. [4]. In our context, they are characterised by a delay in consultation and a lack of awareness of the signs pointing to these tumours. Although they constitute the majority of causes in our context, the predominance of neurological impairment has been reported by Funamura at 38.9% of cases [5]. In our case, these are patients suffering from tumors that have predominated, as in the study of Fatiou [2]. This discrepancy can be explained by a difference in the methodological approach. The frequency of tracheostomy during the course of pharyngeal and laryngeal cancers varies according to the socio-economic and epidemiological context. These factors are decisive and are due on one hand to the patient, to the poor understanding of cancers by the population, and to the insufficient number of practitioners. Tumour obstruction of the pharyngolaryngeal structures is part of the natural history of the cancer. When a tracheotomy is necessary, it is always a tumor obstructing the larynx. In 13 cases Ouoba performed emergency tracheotomy on cancer patients [6]. Laryngeal papillomatosis accounted for 10.5% or 4 cases in our population, all of them children. Laryngeal papillomatosis is the most frequent benign tumour of the larynx in children [7]. This condition, which remains rare, has an unpredictable evolution, which can be life-threatening due to bronchopulmonary damage or malignant degeneration. Apart from the exceptional cases of neonatal onset, the age of onset of the first symptoms is between 2 and 4 years, no case has been reported in adults in our series. Laryngeal dyspnoea is rarely the first sign of the disease, the first sign always being a muffled or hoarse voice without variation over time [8]. Persistence of dysphonia for more than three weeks in a child should lead to laryngoscopy, which reveals pedunculated or sessile tufts, consisting of greyish, whitish or pinkish elements 0.5 mm in diameter, located mainly on the vocal cords or the floor of the ventricles [8]. The onset of dyspnoea illustrates the progressive obstruction of the laryngeal tract. In our study, we performed nasofibroscopy instead, which showed grape-like budding lesions in 3 patients and one patient did not. A tracheotomy was performed in 9.67% of cases in study [9]. In the serie of Fatogoma Tracheotomy was urgently performed 31.2% [8]. We collected 7 cases of traumatic neck pathologies represented by closed laryngeal trauma 5 cases or 13.1% and penetrating neck injury 2 cases or 5.3%. Closed laryngeal trauma is a non-penetrating trauma causing compression or crushing of the laryngotracheal axis against the cervical spine; it follows a violent impact against a contending object or a strong deceleration or strangulation [10]. The main cause is road traffic accidents [10]. Thyroid cartilage fractures are the most common, accounting for about 60% of isolated fractures, but generally have little impact on the respiratory tract [11]. Dysphonia is the most common symptom [12]. Dysphonia was almost always present, ranging from simple hoarseness to aphonia [12]. If dyspnoea is severe or does not subside quickly, it is preferable to perform a tracheostomy under local anaesthetic as soon as possible, especially if there is emphysema [12]. Closed trauma to the larynx can cause laryngeal concussion by nociceptive reflex, ranging from laryngospasm to cardiorespiratory syncope, as well as laryngeal contusion or fracture [13].

Penetrating wounds of the neck are a wound with a break in the platysma. Accidents and attempts at autolysis are the first etiological circumstances [12]. The lesions encountered are varied; they can be serious, with major damage to visceral and vascular structures involving the vital prognosis [12]. The minor functional signs are essentially dysphagia, neck pain, dysphonia or aphonia and the production of haemoptoic sputum [12]. In our study, dysphonia as well as dyspnoea were found in 5.25% of cases. The management is medical and surgical with an exploratory and reparative cervicotomy with a tracheotomy if necessary, to which is associated an adequate adjuvant treatment (antibiotic therapy, corticosteroid therapy, analgesic) [12]. Psychiatric treatment is essential after an attempt at autolysis [12].

Bilateral post thyroidectomy recurrent palsy (PRP) accounted for 3 cases or 7.9% of our indications, all women. Inherent laryngeal immobility is the most classic and feared complication of thyroid surgery [14]. It may be transient due to simple nerve damage or trauma to the recurrent nerve; or

permanent due to total paralysis [14]. It may be unilateral, giving sometimes embarrassing dysphonia, possibly associated with false routes; or bilateral, giving an impressive picture of laryngeal dyspnoea during extubation [14]. Tracheostomy is usually an emergency procedure in ENT. In our study, the tracheostomy performed was 100% surgical. It was performed under general anaesthesia in 53.5% of cases and under local anaesthesia in 46.5%, without any prior preoperative assessment in urgent cases.

Tracheostomy was performed as an emergency in 39 cases (90.7%) and scheduled in 4 cases (9.3%). This shows the urgent nature of tracheotomy. In fact, since its origins, tracheostomy has been a life-saving emergency procedure; respiratory distress being the main indication.

5. Conclusion

At the end of our study, it appears that tracheotomy is an infrequent procedure in the ENT department of the Gabriel Tour é University Hospital. The majority of our study population was male with a sex ratio of 1.69. The main underlying ENT pathologies were pharyngolaryngeal cancers, penetrating neck wounds, laryngeal trauma, laryngeal papillomatosis and finally bilateral recurrent paralysis. However, better working conditions and more qualified staff are needed to achieve better results.

Table 1. *Distribution of patients according to underlying ENT pathology.*

Underlying pathology	Conditions	Number of cases	Percentage
Malignant tumour diseases	Laryngeal tumour	7	18,5
	Pharyngeal tumour	3	7,9
Benign tumour diseases	Laryngeal papillomatosis	4	10,5
	Cystic lymphangioma	1	2,6
Extrinsic compression of the trachea	EC of the oesophagus mouth	1	2,6
	Retro-pharyngeal abscess	2	5,3
	Specific disease of the oral cavity	1	2,6
	Swelling of the oesophagus with laryngeal extension	1	2,6
	Pharyngeal EC complicated by retropharyngeal abscess	1	2,6
Traumatic conditions	Trauma to the larynx	4	10,5
	Penetrating neck wound	2	5,3
	Closed neck trauma	1	2,6
Inflammatory diseases	Ludwig's Angina	2	5,3
	Cervical cellulitis	1	2,6
	Peritonsillar phlegmon	1	2,6
	Esophageal CE complicated by cellulitis	1	2,6
Paralysis	Post-thyroidectomy recurrent paralysis	3	7,9
	Adducted laryngeal paralysis	1	2,6
Foreign body	Bronchial foreign body	1	2,6

Abbreviations

ENT Ear Nose and Throat
CCF Cervico-Facial Surgery
CT Computed Tomography

Author Contributions

Soumaoro Siaka: Conceptualization, Data curation, Methodology, Resources, Investigation, Validation, Visualization, Writing – original draft, Writing – review & editing

Kone Fatogoma Issa: Conceptualization, Data curation, Investigation, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

Cisse Naouma: Conceptualization, Data curation, Investigation, Writing – original draft

Maurinne Kenne: Conceptualization, Investigation, Writing – original draft

Dicko Ibrahim: Methodology

Diarra Kassim: Formal Analysis

Konate N'faly: Formal Analysis

Ouane Aissata: Software, Data curation

Coulibaly Assitan Kole: Software, Data curation

Doumbia Salimou: Software, Data curation

Konate Oumar: Software, Data curation

Bah Famagan: Software, Data curation

Traore Youssouf Traore: Software, Data curation

Boubacary Guindo: Formal Analysis

Singare Kadidiatou: Formal Analysis, Validation, Visualization

Keita Mohamed Amadou: Supervision, Validation, Visualization

Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Boura ïma, F. A., Ametonou, C. B., Agbokponto, A., Hounlelou, V. and Flatin, M.-C. (2026) Tracheotomy in an African Hospital Setting: A 10 Year Retrospective Study in Parakou, Benin. International Journal of Otolaryngology and Head & Neck Surgery, 15, 42-54. https://doi.org/10.4236/ijohns.2026.151005

[2] Laccourreye, L. and Dubin, J. (2001) Tracheotomy. Encyclop édie M édico-Chirurgicale (Scientific and Medical Editions SAS, Paris, all rights reserved), Surgical techniques - head and neck, 46-430., 46-430.

[3] Oppert M, Jungeh ülsing M, Nibbe L. Tracheotomy: Indication and implementation. Med Klin Intensivmed Notfmed. 2024; 119(8): 694-702. German. https://doi.org/10.1007/s00063-024-01184-2

[4] Itiere, O., Otiobanda, G., & Ondzotto, G. (2014). La trach éotomie au CHU de Brazzaville. Revue Africaine de Chirurgie et Sp écialit és, 7(2), 11–14. https://doi.org/10.4314/racs.v7i2.H.CIDDO

[5] Funamura JL, Durbin-Johnson B, Tollefson TT, Harrison J, Senders CW. Pediatric tracheotomy: indications and decannula-tion outcomes. Laryngoscope. 2014 Aug; 124(8): 1952-8. https://doi.org/10.1002/lary.24596

[6] K Ouoba, M Dao, et al. ENT cancers and CCF in Burkina Faso. M édecine d'Afrique noire 1997.44 (8/9) 452-4.

[7] O Maliki, H Nouri et al. Laryngeal papillomatosis in children: epidemiological, therapeutic and evolutionary aspects at (Proposing 21 cases). Journal of pediatrics and child care; 2012; 25: 237-241 https://doi.org/10.1016/j.jpp.2012.06.001

[8] Fatogoma Issa Kone, Kadidiatou Singare, Kadiatou Traore, Oumou Coulibaly, Naouma Cisse, et al. (2020). Epidemiological, Clinical and Therapeutic Aspects of Laryngeal Papillomatosis in Mali. International Journal of Otorhinolaryngology, 6(1), 1-5. https://doi.org/10.11648/j.ijo.20200601.11

[9] Ndour N, Maiga S, Houra A, Deguenonvo REA, Ndiaye C, Pilor N, Mbaye A, Sall AC, Diouf MS, Ndiaye IC. Papillomatose laryngée chez l'adulte: évaluation pendant dix ans au service ORL de l'Hôpital universitaire national de Fann (Dakar, Sénégal). Int J Otolaryngol. 3 août 2020; 2782396. https://doi.org/10.1155/2020/2782396

[10] Trabelsi S, Hachicha, A, Beltaief, N, Charfeddine, A, Tababi, S, Zanine, R, Minif, E, Sahtout, S, & Besbes, G. (2011). Les traumatismes externes du larynx. Journal Tunisien d'ORL et de chirurgie cervico-faciale, 24(1). https://doi.org/10.4314/jtdorl.v24i1.64196

[11] H Ghorbal, C Abidw et al. External trauma of the larynx. J. TUN ORL 2013, 13: 16-9. http://www.journal-storl.net/

[12] Comer BT, Gal TJ. Recognition and management of the spectrum of acute laryngeal trauma. J Emerg Med. 2012 Nov; 43(5): e289-93. https://doi.org/10.1016/j.jemermed.2010.05.023

[13] Schaefer SD, Brown OE. Selective application of CT in the management of laryngeal trauma. Laryngoscope. 1983 Nov; 93(11 Pt 1): 1473-5.

[14] Kone F I, and Mohamed A K. Post-Thyroidectomy Laryngeal Diplegia in Mali: What Therapeutic Challenge? Exp Rhinol Otolaryngol. 1(2). ERO. 000508. 2017. https://doi.org/10.31031/ERO.2017.01.000508