When a Safety-Valve Became a Ticking Time-Bomb: Fractured Tracheostomy Tube as a Tracheobronchial Foreign Body in a Child

Anand Viswanathan¹, Subbian Esakkimuthu²

Abstract
Tracheostomy Tube care is a part of respiratory rehabilitation in acquired brain injury but just tracheostomy tube insertion is not enough. Checking for Pre-requisites including manufacturing details, and regular follow – up is important. Here we present a rare case of fracturing of the tracheostomy tube in a traumatic brain injury which was managed timely.

Key words: Acquired brain injury, Tracheostomy.

Introduction:
Tracheostomy tube care is part of respiratory rehabilitation among persons with acquired brain injury and high cervical spinal cord injury¹ ². Foreign body aspiration is a life-threatening complication while on tracheostomy. We present an instance of a part of the tracheostomy tube fracturing and migrating into the tracheobronchial tree.

Case report
A 4 year old male incurred traumatic brain injury following a road traffic accident in 2003 and had residual left Hemiplegia. He needed long term tracheostomy for management of subglottic stenosis. Following a course of inpatient rehabilitation for left hemiplegia, he resumed functional ambulation and independ but daily activities. Three years post trauma, aged 7, he was brought by his family members to the outpatient brain injury rehabilitation clinic with complaints of the tracheostomy tube found missing since the previous evening. He gave no history of respiratory distress. Based on clinical suspicion, a plain radiograph of the chest was done. It revealed a part of the tracheostomy tube stem lodged at the junction of trachea and right main bronchus, with no other significant abnormality (Fig 1). He was immediately referred to the Pediatric Emergency Department for management by Pediatric Surgery. He underwent rigid bronchoscopy and removal of the tracheostomy tube fragment. A new metal

Fig 1 - Chest radiograph revealing fractured tracheostomy tube in right tracheobronchial tree
tracheostomy tube was inserted via the stoma. Post-
procedure period was uneventful and he was discharged
from the hospital two days later. Since then, he has been
followed up for about seven years, and he has had no
complications.

Discussion

While many reports mention only a few of the published
literature, we were able to identify at least 35 reports of
tracheobronchial tree foreign body due to a fractured
tracheostomy tube.\(^3\)\(^-\)\(^37\) Potential causes that have been
ascribed for such fractures include manufacturing/
designing defects, corrosion due to alkaline tracheal
secretions, repeated boiling.\(^9\) Metal, PVC and silicone
tracheostomy tubes have all been implicated.\(^16\),\(^18\),\(^30\) The
junction of the stem with the flanges is the commonest
site of fracture, though fracture at the level of fenestration
has been reported too.\(^22\) Fractures have been reported to
have occurred as early as within 8 hours of first use.\(^31\)
Complications include but are not limited to respiratory
distress, lower respiratory infection, and death.\(^19\) The
boy in our case report was asymptomatic probably
because the lumen of the fractured tracheostomy tube
was strategically lodged at the junction of trachea and
the right main bronchus such that it acted like a stent.
It is also possible that presentation to the hospital and
therapeutic intervention within 24 hours of aspiration
could have precluded sequelae related to delayed
inflammatory response.

Respiratory tract pathology being among the leading
causes for morbidity and mortality among persons with
tracheostomy, it is essential to ensure diligent care.
Checking for manufacturing defects prior to insertion,
regular follow-up inspections of the tube to detect early
signs of wear should be essential part of care. Change
of tracheostomy tube at regular intervals should also be
considered in order to prevent this rare but potentially
fatal complication related to fracturing of tracheostomy
tube.

References

A-L. Tracheostomy in craniectomised survivors
after traumatic brain injury: a cross-sectional
2. McCully BH, Fabricant L, Geraci T, Greenbaum
A, Schreiber MA, Gordy SD. Complete cervical
spinal cord injury above C6 predicts the need for
tracheostomy. Am J Surg. 2014; \(^{1}\):
3. BASSOE HH, BOE J. Broken tracheotomy tube as
a foreign body. Lancet. 1960 7; \(^{1}\) 1006–7.
4. Artamonov NA. [Part of the tracheotomy tube as
a foreign body of the trachea]. Zhurnal Ushnykh Nos
Gorl Bolezn J Otol Rhinol Laryngol Sic. 1965 ;
\(^{25}\) 84.
5. Kakar PK, Saharia PS. An unusual foreign body in
the tracheo-bronchial tree. J Laryng Otol. 1972;
\(^{86}\) 1155–7.
6. Kemper BI, Rosica N, Myers EN, Sparkman T.
Inner migration of the inner cannula: an unusual
foreign body. Eye Ear Nose Throat Mon. 1972 ;
\(^{51}\) 257–8.
7. Sood RK. Fractured tracheostomy tube. J Laryng
Otol. 1973; \(^{87}\) 1033–4.
8. Maru YK, Puri ND, Majid A. An unusual foreign
body in the tracheobronchial tree. J Laryng Otol.
1978; \(^{92}\) 1045-8.
1983; \(^{97}\) 771–4.
10. Myatt JK, Willatts DG. An inhaled tracheostomy
tube. Successful anaesthetic management.
Anaesthesia. 1984 ; \(^{39}\) 1235–6.
11. Bowdler DA, Emery PJ. Tracheostomy tube
fatigue. An unusual cause of inhaled foreign body.
12. Otto RA, Davis W. Tracheostomy tube fracture:
an unusual etiology of upper respiratory airway
obstruction. The Laryngoscope. 1985; \(^{95}\) 980-1.
13. Gupta SC. Fractured tracheostomy tubes in the
tracheo-bronchial tree: (a report of nine cases).
J Laryng Otol. 1987 ; \(^{101}\) 861-7.
14. Slotnick DB, Urken ML, Sacks SH, Lawson
W. Fracture, Separation, and Aspiration of
Tracheostomy Tubes: Management with a New
1; \(^{97}\) 423-7.
An unusual complication of tracheostomy. Arch
16. Majid AA. Fractured silver tracheostomy tube: a
case report and literature review. Singapore Med J.
1989 ; \(^{30}\) 602-4.


