

Management of Paediatric Traumatic Tracheal Rupture: A Case Series.

Dr Claudia Mason, Mr James Hamill, Matthew Sawyer - Starship Children's Hospital, Auckland, New Zealand.

Introduction

Traumatic tracheal rupture is a rare but potentially life threatening presentation within the paediatric population, occurring in around 1.4% of cases of blunt chest trauma. Presentation varies significantly. Signs of injury range from non-specific including chest pain, dyspnea and dysphonia, to more obvious subcutaneous emphysema (occurring in approximately 85% of reported cases). Reported treatment options vary from expectant management to urgent operative intervention. The aim of this case series is to highlight the diagnosis and interdisciplinary management of traumatic tracheal rupture in children.

Methods

A case series of paediatric patients with blunt traumatic tracheal rupture managed at Starship Children's Hospital from 2013-2023. The New Zealand National Trauma Database was used to identify patients for review. Data was collected on patient demographics, injury description, mechanism of injury, management, length of stay and follow up.

Results

Over a 10year period, 4 cases of blunt traumatic tracheal rupture were managed at Starship Children's Hospital. 1 case was excluded due to death secondary to high spinal cord injury. All had sequelae of tracheal injury evident on computed tomography (CT), however specific location of injury was often difficult to detect. All injuries were confirmed intra-operatively on laryngoscopy and bronchoscopy (L+B), which is considered the gold standard for diagnosis. Patients were managed conservatively, as per the consensus of our multidisciplinary team. They all subsequently went on to be discharged from follow up, with no long term complications.

Demographics

	A	B	C
Age	5yo.	8yo.	10yo.
Sex	M.	M.	F.
Ethnicity	Māori.	European.	Asian.
Mechanism Of Injury	Striking handlebars of bicycle.	Paedistrian vs. motorbike.	Motor vehicle accident.

Presentation + Management

	A	B	C
Symptoms	Reluctance to speak, neck pain.	Dyspnea, dysphonia, chest pain.	Nil.
Signs	Tripoding, subcutaneous emphysema, neck swelling + bruising.	Subcutaneous emphysema, head + neck swelling.	Subcutaneous emphysema, neck abrasion.
Intubation	Yes (ED).	Yes (On scene).	No.
CT Findings	Extensive subcutaneous emphysema neck/chest wall tracking to mediastinum/pleural space. Upper tracheal inflammation.	Extensive subcutaneous emphysema neck, extending to face/mediastinum + pleural space.	Pneumo/hemo mediastinum. Posterior tracheal injury 5mm above carina.
Operative Findings	Linear tear to left of trachealis under cricoid.	Granular tissue right posterior mid-distal trachea.	Mucosal injury above carina with blood keratin film.
Further Relook	Yes.	Yes.	No.

Outcomes

	A	B	C
Length Of Intubation	5days.	4days.	N/A.
Length Of Stay (ICU/Ward)	7days / 10days.	5days / 16days.	1day / 7days.
Complication	No.	MSSA line sepsis, torticollis.	No.
Follow-up	No.	Trauma CNS phone call, elective L+B.	Trauma CNS phone call, elective L+B.
Readmission	No.	Elective L+B.	Non specific abdominal pain.

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Conclusion

Traumatic tracheal rupture is an uncommon injury within the paediatric population. The spectrum of presentation varies, as such it is incumbent on the treating team to have higher index of suspicion, when suggested by mechanism of injury. There is no consensus opinion on management of tracheal injury. Several retrospective reviews have supported open surgical repair in patients presenting with subcutaneous emphysema. Others have proposed prolonged intubation + non-operative management in stable patients, without signs of worsening air extravasation or injury. This case series demonstrates the success of conservative management of tracheal injury and highlights the importance of collaborative multidisciplinary care in achieving optimal outcomes for our patients.