

## Successful Non-Surgical Management of Extensive Tracheal Injury

### Kapsamlı Trakeal Yaralanmanın Cerrahi Olmayan Başarılı Yönetimi

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#### ABSTRACT

Tracheal injury following a blunt trauma is rarely encountered. Tracheal injury usually requires immediate airway intervention as it is life-threatening. Rarity of this entity along with lack of concrete evidence-based literature poses a great conundrum in managing such patients. Amongst the meagre reported cases, bridging of the defect is recommended either via an endotracheal or a tracheostomy tube. Herein, we report a case of a teenage boy post trauma who sustained an extensive posterior tracheal wall laceration and was successfully managed conservatively. Close monitoring alongside serial imaging and diligent involvement of multidisciplinary team led to a complete recovery in this patient. We suggest that management of patients with tracheal injury should include a multidisciplinary team discussion to gather input from other teams in keeping with the possibility of the non-surgical approach. Awareness of this entity and its management is prudent as to avoid further unnecessary procedures which may cause mortality.

**Key Words:** Tracheal rupture, neck trauma, traffic accidents, conservative

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#### ÖZET

Künt travma sonrası trakeal yaralanmaya nadiren rastlanır. Trakeal yaralanma, hayatı tehdit ettiği için genellikle acil hava yolu müdahalesi gerektirir. Bu varlığın nadirliği ve somut kanıta dayalı literatür eksikliği, bu tür hastaların yönetiminde büyük bir muamma oluşturmaktadır. Az sayıda bildirilen vakalar arasında, defektin bir endotrakeal veya trakeostomi tüpü aracılığıyla köprülenmesi önerilir. Burada, geniş bir posterior trakeal duvar laserasyonu geçiren ve konservatif olarak başarıyla tedavi edilen bir travma sonrası genç bir erkek çocuğu olgusunu sunuyoruz. Seri görüntüleme ve multidisipliner ekibin özenli katılımının yanı sıra yakın izleme bu hastada tam bir iyileşme sağlamıştır. Trakeal yaralanmalı hastaların yönetiminin, cerrahi olmayan yaklaşım olasılığına uygun olarak diğer ekiplerden girdi toplamak için multidisipliner bir ekip tartışmasını içermesi gerektiğini öneriyoruz. Bu kuruluşun ve yönetiminin bilinci, ölüme neden olabilecek başka gereksiz prosedürlerden kaçınmak için ihtiyatlıdır.

**Anahtar Sözcükler:** Trakeal rüptür, boyun travması, trafik kazaları, konservatif

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**INTRODUCTION**

Blunt neck injury may occur following myriad trauma including crush injuries, road traffic accidents and whiplash injury. Tracheal injury is feared for its devastating outcome. Most patients succumb before admission (1). Unlike penetrating tracheal injury which mostly occur at anterior cervical trachea, blunt trauma is oftentimes associated with posterior membranous trachea. Patients presenting symptoms ranges from subcutaneous emphysema to significant airway compromise (2). Early surgical interventions were recommended based on previous case series (3). Our case is unique as we managed an extensive tracheal injury conservatively without artificial ventilation.

**CASE REPORT**

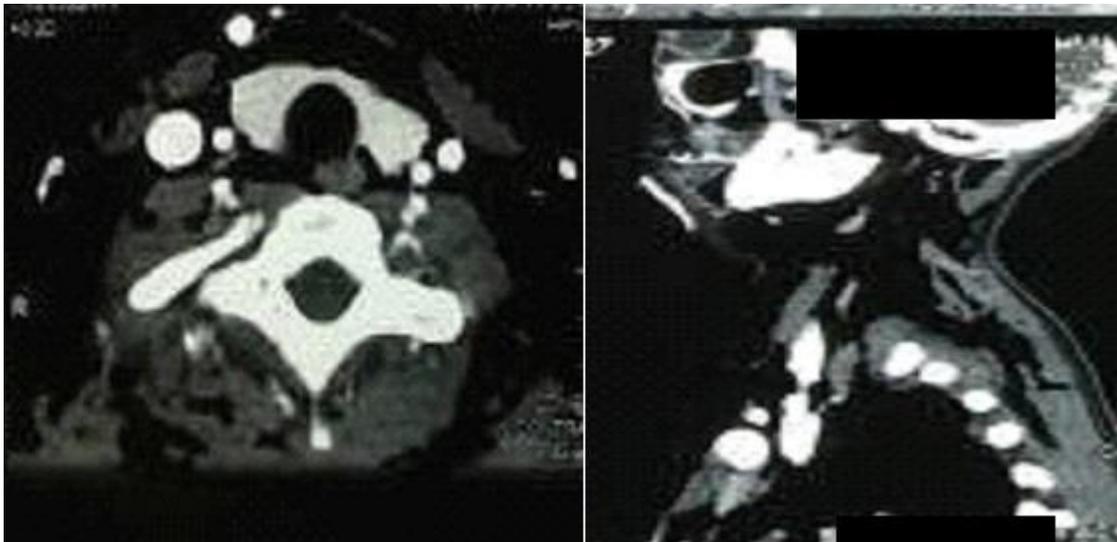
A 15-year-old boy was referred to us by district hospital casualty unit after alleged motor vehicle accident. According to witness, patient was riding a motorbike when he skidded and was thrown face and chest facing forward and hit a metal divider. Patient had a momentary loss of consciousness for 5 minutes and he spontaneously regained consciousness. Upon review in our casualty, he was conscious, alert and his Glasgow Coma Scale was 15/15. Patient's saturation maintained more than 95% under high flow mask oxygen, not tachycardic and he was not in respiratory distress. No audible stridor, shortness of breath and no hoarseness were noted.

Neck examination revealed multiple abrasion wound with bruises extending till upper chest region with no evidence of open wound (Figure 1). Neck palpation demonstrated presence of extensive subcutaneous emphysema extending from hyoid bone to nipple line. Laryngeal crepitus cannot be assessed due to edema.



**Figure 1:** Anterior neck abrasion with bruises

Chest x-ray revealed bilateral pneumothorax and chest tube were inserted bilaterally at once. Broad-spectrum antibiotics was commenced by the district hospital team. Computed tomography (CT) neck and thorax revealed posterior tracheal wall laceration extending from C7 till 1.5cm above carina with extensive subcutaneous emphysema, bilateral pneumomediastinum (Figure 2), right third rib fracture with lung contusion and bilateral pneumothorax together with grade III liver injury. An intense multidisciplinary discussion involving the ENT, Cardiothoracic, and Anaesthesiology team along with his family members was commenced at once whereby patient was opted for non-surgical intervention and was placed in intensive care unit.



**Figure 2:** CT Neck demonstrating tracheal discontinuity at cervical and thoracic level with extensive subcutaneous emphysema

Patient was under close monitoring in our intensive care unit and was successfully weaned off his oxygen and his chest tube day 7 of injury. He was discharged well after 2 weeks of hospital stay. Repeated CT neck and thorax done 3 months post injury revealed gradual reduction of the tracheal laceration (Figure 3). Informed consent was obtained from the patient to include his photograph for education purpose and publication



**Figure 3:** CT Neck revealed reduction of size of posterior tracheal laceration

## DISCUSSION

Tracheal injury involves 0.34 to 1.5% of neck traumas and is said to be more common amongst adults. Tracheal injury following blunt trauma is rare, as airway is protected by mandible, sternum, ribcage and vertebral column (4). Apart from that, protective mechanism of cartilaginous trachea makes it flexible, elastic and mobile adds on to the rarity of these condition (5). Rarity of these entity makes it a challenge even for an experienced surgeon to manage these cases.

Presenting symptoms includes shortness of breath, cough, haemoptysis and cyanosis which is vague and may be missed by attending physicians. Tell-tale signs of airway injury is presence of neck bruises, cervical emphysema and loss of laryngeal crepitus similar to our patient described.

Management of these patients should encompass a meticulous head-to-toe examination to look for other concomitant injuries (6). Gold standard investigation is direct visualization of the tracheal injury via bronchoscopy. Having said so, radiological imaging notably high-resolution computer tomography with reconstruction has become the investigations of choice as it's non-invasive (7). It allows identification of specific site and size of the injury along with surgical planning.

Securing airway is the immediate concern in patients with tracheal injury. Our patient despite having an extensive tracheal tear, fortunately was stable and didn't require emergency intubation. In addition to that, we avoided elective intubation or tracheostomy as we were concerned regarding the possibility of further iatrogenic tear in addition to possible failure of ventilation due to leakage. Furthermore, as the tracheal injury was extensive and involved both cervical and thoracic part of trachea, longer tube which can bypass the tear was required to achieve optimal bi-lung ventilation. In spite of that, patient was placed in intensive unit with multidisciplinary team involvement in managing this patient. Patient recovered well without needing any surgical intervention which was proven both clinically and via serial imaging.

Gomez-Caro et al, reported that conservative management of tracheobronchial injuries had good outcome (85%) in their centre in Madrid (8). They encountered 33 cases in 11 years, comprising both iatrogenic and non-iatrogenic injuries. However, as per their experience, membranous injuries were most likely to succeed conservative approach as compared to cartilaginous injuries, as in our patient. They recommended that oesophageal related injuries, progressive emphysema, presence of severe dyspnoea, or mediastinitis as indications for immediate surgery.

## CONCLUSION

As a whole, despite its perplex nature, management of tracheal injury ought to be considered seriously, keeping in mind its devastating life-threatening complications. We suggest that management of patients with tracheal injury should include a multidisciplinary team discussion to gather input from other teams in keeping with the possibility of the non-surgical approach. Awareness of this entity and its management is prudent as to avoid further unnecessary procedures which may cause mortality.

## Conflict of interest

No conflict of interest was declared by the authors.

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