

An unpredicted case of tracheal necrosis following thyroidectomy



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Tracheal rupture is a rare condition, and its most common cause is head and neck injury. Nontraumatic disruption of the anterolateral fibrocartilaginous trachea is an exceptional complication following thyroidectomy with few cases reported in literature.

We report a case of upper tracheal necrosis arising 15 days after uneventful total thyroidectomy and resulted in pneumomediastinum and subcutaneous emphysema. The patient felt a sudden pop in his neck following an episode of vigorous coughing and experienced rapid swelling in his neck. The presence of pneumomediastinum was diagnosed on chest Computed Tomography scan and bronchoscopy visualized a small perforation on the right side of the anterolateral tracheal wall.

The first interesting aspect is that several factors (female gender, thyrotoxic goiter, wound infection or excessive use of diathermy) reported as possible cause of anterior tracheal necrosis in the previous reports are unlike for the present case. The second unusual point is the spontaneous healing of the tracheal tear. Considering the no-critical ill condition of the patient and the size of the tear we decide for a conservative treatment rather than surgical repair.

Finally, our report underlights that the presence of subcutaneous emphysema following thyroidectomy should alert the possible existence of tracheal rupture. The favourable outcome of our patient shows that small tracheal perforation due to tracheal necrosis may be successfully treated with conservative treatment.

KEY WORDS: Thyroidectomy, Tracheal necrosis, Tracheal rupture.

Introduction

Tracheal rupture is a rare condition, and its most common cause is head and neck injury. Iatrogenic rupture is extremely rare and may be caused by several factors as intubation, tracheostomy, bronchoscopy, placement of stents, and esophagectomy ¹. Non-traumatic disruption

of the anterolateral fibrocartilaginous trachea is an exceptional complication following thyroidectomy with few cases reported in literature (Table I). Herein, we describe a clinical case of upper tracheal necrosis arising 15 days after uneventful total thyroidectomy and resulted in pneumomediastinum and subcutaneous emphysema. Healing of tracheal rupture was obtained with conservative treatment.

Case report

A 65 years old man, non-smoker, underwent elective total thyroidectomy due to bilateral adenoma via cervical incision. The patient had no history of cardiovascu-

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lar, pulmonary, or renal disease; preoperative physical examination and laboratory test revealed no significant abnormalities. The intubation was uneventful and total thyroidectomy was performed by an experienced senior surgeon. The patient was extubated uneventfully. Postoperative course was unremarkable and the patient was discharged on postoperative day five. There was no evidence of wound infection or abnormal swelling of the operative site. On post operative day 15, the patient felt a sudden pop in his neck following an episode of vigorous coughing and experienced rapid swelling in his neck. However, he was not in respiratory distress, his pulse and blood pressure were stable, and there were no distended neck veins, cyanosis, or other signs of circulatory failure and of airway obstruction. A chest X-ray

showed subcutaneous emphysema and the presence of pneumomediastinum was diagnosed on chest Computed Tomography (CT) scan (Fig. 1). Bronchoscopy visualized a 1.5 mm x 1.5 mm perforation on the right side of the anterolateral tracheal wall at distance of 4.5 cm above the carina (Fig. 2). Considering the no-critical respiratory condition of the patient and the small size of the tracheal defect, we opted for conservative treatment (bed rest, antibiotic, and cough suppressants) rather than surgical repair. Spontaneous absorption of the air was obtained within two weeks as confirmed by chest CT scan (Fig. 3). Yet, bronoscopic view performed two weeks later, confirmed the complete healing of tracheal defect (Fig. 4). At one year of follow-up, the patient was well with no tracheal symptoms.



Fig. 1: CT scan of the neck clearly demonstrates a pre-tracheal accumulation of air (white arrow) without any detectable site of communication to the cervical trachea.



Fig. 3: CT scan performed 10 days later, reveals no-recurrence of pneumomediastinum.

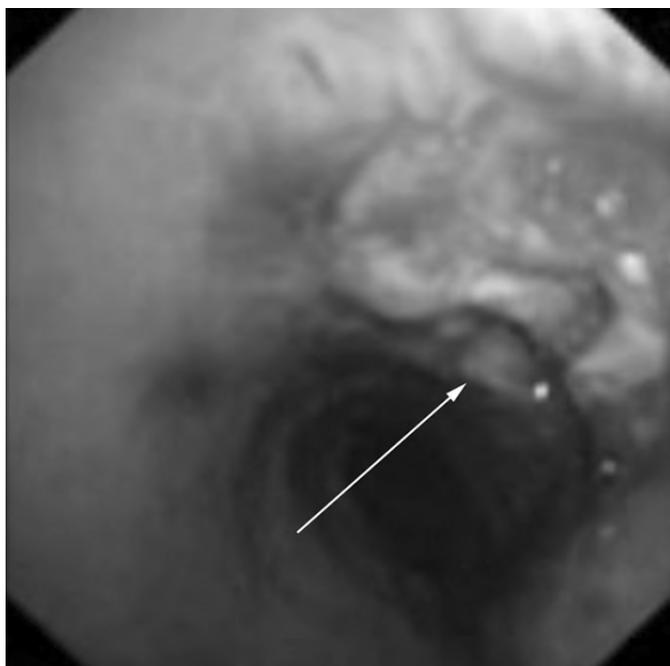


Fig. 2: Bronchoscopic view shows that the lesion is confined on the right side of the anterolateral fibrocartilaginous tracheal wall (white arrow), without extension to the posterior membrane. The lesion (1.5 x 1.5 mm in size) is surrounded by a ridge of granulation tissue.

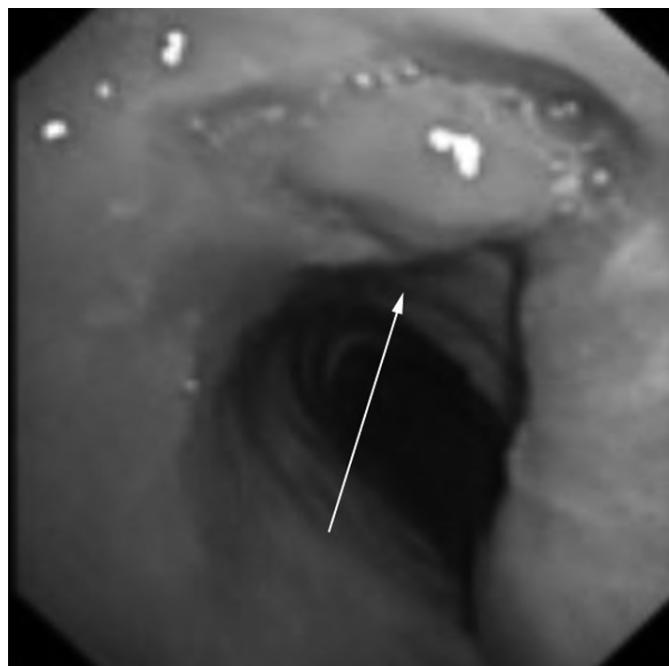


Fig. 4: Bronchoscopy repeated 15 days after, the initial diagnosis demonstrates complete healing of the tracheal rupture without signs of tracheal stenosis and/or of malacia. During the exam, a leak test is performed irrigating the site of the initial lesion, but no escape of air is noted.

TABLE I - Review of anterior tracheal lesion following thyroidectomy.

Author	Age	Gender	Thyroid Disease	Size of lesion (mm)	Treatment
Jacquín [2]	53	Man	Grave's Disease	No-reported	Surgical
Damorose [3]	20	Female	Grave's Disease	1 x 2	Surgical
To [4]	62	Man	Papillary carcinoma	No-reported	Surgical
Chauchan [5]	65	Man	Medullary Carcinoma	5	Surgical
Present case	65	Man	Adenoma	1,5 x 1,5	Conservative

Discussion

The first interesting aspect of our case is that the factors reported in previous reports as possible causes of anterior tracheal necrosis are unlike to explain the present case.

1) Our patient has no-risk factors including female gender and/or thyrotoxic goiter ².

2) Damrose et al. ³ consider the excessive use of diathermy as the most likely cause of necrosis due to the devascularization of the tracheal wall through thermal injury from coagulation. However, in our case blood loss requires no-extensive intraoperative cauteterization.

3) To et al. ⁴ report that wound infection may be a complicating factor of tracheal necrosis, but in the present case no suppuration is found and all microbiological studies are negative.

4) Tracheal necrosis may be the result of disruption of blood supply of the trachea. This vascular insufficiency is induced by cervical and mediastinal lymph node dissection during thyroidectomy for cancer, which interfered with the various arterial branches that contribute to the longitudinal vascular anastomosis along the lateral trachea. In contrast to Chauchan ⁵, and To ⁴, we do not perform selective cervical and/or mediastinal dissection (levels 2, 3, 4, and 6) because the patient has a benign pathology.

5) Tracheomalacia is considered as another possible etiological factor of tracheal necrosis due to the degeneration of the normal tracheal wall support elements secondary to compression ². In our case extubation is uneventfully and postoperative course unremarkable.

6) The consequences of intubation due to direct traumatic injury or to cuff pressure which induce ischemia resulting in tissue necrosis ⁵. These potentially injuries usually result in a longitudinal laceration of the posterior membranous part of the trachea while in the present case the lesion occurs in the anterolateral site.

The second unusual point is the spontaneous healing of the tracheal injury, conversely the cases reported above and summarized in Table I.

The best strategy for the treatment of tracheal lesion depends of the size of the lesion and of clinical condition of the patient.

Kaloud et al. ⁶ report that surgical repair is indicated for transmural tears with a length exceeding 1 cm and

if pneumothorax and pneumomediastinum are present. In contrast, Kuhne et al. ⁷ report that conservative treatment may be indicated for tracheal disruption less than 2 cm.

In our case, the patient is clinically stable in spontaneous respiration with no respiratory difficulty or air leakage; no signs of progression of emphysema and/or of pneumomediastinum, and no symptoms of infection are present. Yet, considering the small size of the tear we decide for a conservative treatment rather than surgical repair.

Finally, the presence of subcutaneous emphysema following thyroidectomy should alert the possible existence of tracheal rupture. Bronchoscopic examination provides data on the exact site and the extension of the lesion and helps to plan the therapeutic approach. The favourable outcome of our patient shows that small tracheal perforation due to tracheal necrosis may be successfully treated with conservative treatment.

Riassunto

La lesione della trachea è una complicanza dei traumi della testa e del collo. Più rara invece è la lesione della parete antero-laterale della trachea conseguente ad interventi di tiroidectomia. Nel presente lavoro, gli autori riportano il caso clinico di una lesione della parete anteriore della trachea insorta dopo 2 settimane dall'intervento chirurgico di tiroidectomia in seguito ad una energica tosse. La TAC del torace diagnosticava la presenza di pneumomediastino mentre la broncoscopia mostrava una piccola lesione della parete antero-laterale della trachea. Considerate le stabili condizioni cliniche del paziente e le piccole dimensioni della lesione tracheale, si è preferito non intervenire chirurgicamente. Dopo 15 giorni, la lesione tracheale è andata incontro a spontanea cicatrizzazione con la completa risoluzione del pneumomediastino e dell'emfisema sottocutaneo.

Il primo interessante aspetto del presente caso è il fatto che nessuno dei fattori di rischio riportati in altri casi di lesione tracheale dopo tiroidectomia descritti in letteratura (sesso femminile, gozzo tireotossico, suppurazione della ferita, eccessivo uso della termo-coagulazione) può essere preso in considerazione come causa della complicanza da noi osservata. Inoltre la spontanea

nea cicatrizzazione della lesione tracheale è il secondo aspetto che rende unico il nostro dagli altri casi precedentemente riportati.

Pertanto, la lesione tracheale è una complicanza tardiva che può manifestarsi dopo interventi di tiroidectomia. La presenza di pneumomediastino e/o di enfisema sottocutaneo deve sempre far sospettare la perforazione tracheale. Se la lesione è di piccole dimensioni e le condizioni cliniche del paziente sono stabili, il trattamento conservativo può portare alla completa cicatrizzazione della lesione tracheale con la risoluzione del quadro clinico.

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