

Case Report

Suturing of Tracheomalatic Rings Complicating Long-standing Huge Goiters to Adjacent Structures

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Abstract

Five patients selected having huge goiter compressing and deviating trachea, with criteria of tracheomalacia which were scheduled for total thyroidectomy with fixing tracheomalatic rings to adjacent structures instead of other methods used previously, with follow-up more than 1 year. We report five cases of tracheomalacia following total thyroidectomy for huge multinodular goiters which were diagnosed and managed, despite different support techniques. The surgical management of tracheomalacia is still a challenging problem. It is found that this method is superior to other methods of overcoming tracheomalacia complicating huge goiter and associated with no/nor mortality, so this simple procedure can be used as a first line of treatment of tracheomalacia complicating long-standing huge goiter.

Keywords: Goiter, huge long-standing goiters, tracheomalacia

INTRODUCTION

Tracheomalacia is characterized by weakness of the tracheal wall related to softness of the cartilaginous support.^[1] This allows the affected portion to collapse under conditions where the extraluminal pressure exceeds the intraluminal pressure.^[2] Tracheomalacia may be classified into either congenital (primary) or acquired (secondary). Congenital tracheomalacia may be further subdivided into idiopathic or syndromic conditions. Tracheoesophageal fistula, CHARGE syndrome, and DiGeorge syndrome are associated with congenital tracheomalacia. Acquired tracheomalacia is typically caused by extrinsic compression of great vessels or is secondary to bronchopulmonary dysplasia. Symptoms include episodic respiratory distress, persistent dry cough, wheezing, dysphagia, and recurrent respiratory infections. Failure to wean from the ventilator or failure of extubation may also be indicative of tracheomalacia.^[3]

Malacia is abnormal softening of a biological tissue, most often cartilage. Tracheomalacia exists when the cartilaginous framework of the trachea is unable to maintain airway patency,^[4] which may be either due to congenital immaturity of tracheal cartilage or previously normal cartilage undergoing degeneration due to extrinsic compression as in enlarged thyroid where the weakness of tracheal wall is caused by

softness of supporting cartilage and hypotonia of myoelastic elements.^[5]

The anatomical relationship between the thyroid gland and the trachea is of great clinical importance where the intratracheal airflow rate may be critically compromised if the lumen is deformed by a goiter. Giant multinodular goiters are common in the endemic region as in Iraq. These goiters are presented with compression symptoms such as difficulty in respiration and swallowing or complicated with thyrotoxicosis and thyroid cancer, compliance over that in the adjacent tracheal tissue.^[6]

Tracheomalacia is a common complication in patients undergoing thyroidectomy for a giant goiter. In patients with huge thyroid, it is due to extrinsic compression by enlarged thyroid in which previously normal cartilage undergoes degeneration, so it is an important clinical problem complication long-standing goiter, and the incidence of tracheomalacia will depend on the frequency of this type of goiter.^[7] Thyroidectomy for giant goiters is associated with a high incidence of postoperative asphyxia, and tracheostomy

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may be a lifesaving procedure in these circumstances, but delay may prove fatal when its need arises insidiously; it is, therefore, better established prophylactically in patients who are more likely to develop asphyxia. Despite different support techniques, the surgical management of tracheomalacia is still a challenging problem as prolong compression affects the integrity of the tracheal wall and increase the membranous trachea. Measurements were also larger than the mean, but the ratio of cartilage to muscle was reduced as the proportion of cartilage would signify rigidity. This decreased ratio would imply easier collapsibility of the trachea.^[8]

Several techniques have been advocated for the management of tracheomalacia such as prophylactic endotracheal intubation, tracheostomy, intraluminal tracheal splints, and autologous costal cartilage ring grafts to support the trachea anteriorly.^[9]

The aim of this study was to examine the efficiency of surgical treatment in patients with segmentary tracheomalacia by suturing of tracheomalatic rings complicating long-standing goiters to adjacent structures.

CASE REPORT

Five patients were selected who had huge goiter compressing and deviating trachea. They also selected with the criteria of tracheomalacia and scheduled for total thyroidectomy with fixing tracheomalatic rings to adjacent structures instead of other methods used previously. The patients were subjected to follow-up more than 1 year for each case during the period from 2015 to 2018 [Figure 1].

Imaging of the trachea can be done by plain X-ray, computerized tomography (CT), magnetic resonance imaging (MRI), and to some extent ultrasound. Plain X-ray has a low sensitivity and shows poor correlation with the airflow rate; the cross-sectional area of the trachea can be measured by CT or MRI; studies using these methods have been conflicting as regards the correlation to the airflow rate.

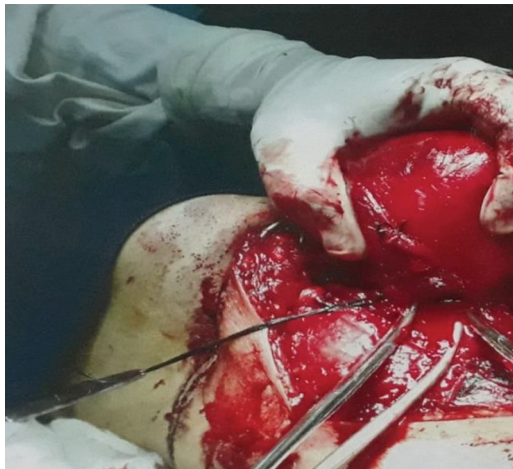


Figure 1: Huge goitre weight 1017 gm with history of more than 25 years

DISCUSSION

Five patients were selected to do this type of operation after discussing with them procedure, from 2015 to 2018 with follow-up of more than 1 year for each case.

The patients' age ranged from 45 to 65 years, with male-to-female ratio being 1:4. All of them have huge neglected goiter, more than 65-cm neck circumference, more than 20-year history if having goiter and increasing in size, minimal neck extension, and sign and symptom of difficult respiration and swallowing, and two of them have hoarse voice. The usual routine and specific investigation was done for goiter patients, two of them have toxic goiter and the rest are of euthyroid status; X-rays and fluoroscopy revealed gross deviation of the trachea and sever narrowing and compression in the subglottic region; a diagnostic criterion of more than 50% reduction of the cross-sectional area of the trachea during expiration has been found in both bronchoscopy and CT scan studies, so tracheomalacia was pronouns in these patients.

In our cases, as the assessment of airway by X-ray and fluoroscopy studies revealed gross deviation of the trachea and compression in the subglottic region, further evaluation by radiological consultation was obtained; CT scanning and MRI have facilitated the evaluation of airway disorders, and CT scan of the neck revealed multinodular goiter with minimal extension. The definitive method of diagnosis for tracheomalacia is bronchoscopy, and during bronchoscopy, the anterior wall can be observed to collapse against the posterior wall.^[5]

Our patients were scheduled (according to their time presented to us) to perform total thyroidectomy with transfixing tracheomalacia rings to adjacent structures and prepared well to do operation; the two toxic patients received NeoMercazole tablets 2 × 3/day with Inderal tablets 40 g twice/day and Lugol's solution for 2 weeks preoperatively.

After completion of thyroidectomy, we found that the trachea was soft and floppy, and collapse of the trachea was observed following slight and gradual withdrawal of the endotracheal tube in all patients, so the tracheomalacia rings were sutured by monofilament sutures, from their lateral side of both sides of the trachea to the fascia underlying sternocleidomastoid muscle, and from superolateral side of the trachea to the fascia of the strap muscle. Also, the lower end of the cervical trachea was sutured to periostemon of manubrium sternum at its ends.^[6]

In our patients, fixation of the tracheal rings to adjacent structures maintained an anterolateral counter traction on the anterior wall of the trachea, prevented its backward collapse, and kept the airway patent. This simple surgical technique of tracheopexy carries no additional morbidity and was effective in those patients; after this, the trachea did not collapse after extubation. These patients after more than 1-year follow-up show no complications and pass well.^[8]

Our study found that this new surgical technique is superior to the method of overcoming tracheomalacia complicating huge goiter and associated with no/nor mortality, so this simple procedure can be used as a first line of treatment of tracheomalacia complicating long-standing huge goiter.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients had given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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