

Late manifestation of bilateral laryngeal nerve palsy after thyroidectomy

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ABSTRACT

Respiratory distress is a feared complication after thyroid surgery. Differential diagnosis includes bilateral recurrent laryngeal nerve palsy (BRLNP), local hematoma, vocal cord edema and laryngeal trauma. BRLNP results from intraoperative irritation without physical injury (neurapraxia), or intraoperative partial or complete transection (axonotmesis and neurotmesis, respectively) of the recurrent laryngeal nerve (RLN). RLN palsy typically manifests immediately in the postoperative course. However, in rare cases there is a delayed, progressive development of BRLNP, potentially leading to respiratory failure in emergency setting weeks after initial surgery. Herein we report on a patient developing massive respiratory distress secondary to BRLNP 5 weeks after thyroidectomy for massive goiter. With the current tendency to decrease the length of hospital stay after thyroid surgery, late onset palsy of the RLN should be included into the differential diagnosis for acute respiratory distress in patients with recent history of thyroid surgery.

Key words: bilateral recurrent laryngeal nerve palsy, respiratory distress, thyroidectomy, goiter, postoperative complication.

Introduction

Thyroidectomy can lead to life-threatening postoperative complications as there are acute respiratory failure, postoperative bleeding and hypocalcaemia. These events typically occur early in the postoperative course. (1) Herein we report that recurrent laryngeal nerve (RLN) palsy can also develop very late after thyroidectomy leading to severe respiratory distress in patients initially asymptomatic after thyroid surgery. We describe the case of an 80 year old patient admitted to the emergency department with massive respiratory distress due to bilateral laryngeal nerve

palsy more than one month after thyroidectomy for massive goiter.

Case report

An 80 year old patient was admitted to the emergency room of the local hospital for severe dyspnea with inspiratory stridor and tachypnea. There was thyroidectomy for massive goiter 5 weeks earlier. Recovery from surgery has been uneventful. Postoperative indirect laryngoscopy had shown regular mobility of both vocal cords. The patient had been discharged from the hospital without any sign of respiratory distress. Physical examination at admission showed inspiratory stridor and bronchospasm, but was otherwise without pathological findings. The chest X-ray was normal. Laboratory results showed severe hypocalcaemia (<1,25mmol/l). Under

the initial diagnosis of laryngo- and bronchospasm of unknown origin, the patient received high dose corticosteroids. Because this therapeutic regime did not result in clinical amelioration, the patient was transferred to our university hospital. Flexible endoscopy revealed right complete and left subtotal vocal cord paralysis. Persisting dyspnea required emergency tracheotomy. Thereafter, the respiratory situation of the patient improved continuously. Repetitive endoscopic examination confirmed persisting bilateral RLN palsy, which persisted after the normalization of blood Ca^{2+} levels. The patient was, after tracheotomy, discharged with stable respiratory condition to rehabilitation. A follow-up examination two months after emergency admission found persistent right complete vocal

cord paralysis while the left vocal cord showed regular mobility. The patient was free of dyspnea.

The retrospective analysis of the case revealed that the patient had consulted his treating family physician because of progressive exertional dyspnea 3 weeks after thyroidectomy. One week before emergency admission, a local ear-nose-throat (ENT) doctor had diagnosed unilateral right vocal cord paralysis and had initiated conservative treatment with corticosteroids.

Discussion

The clinical picture of bilateral recurrent laryngeal nerve palsy (BRLNP) is dominated by inspiratory stridor and respiratory distress, while phonation is relatively less affected. BRLNP is rare, occurring in approx. 0.2% of thyroidectomies for benign thyroid affections. (2) Epidemiological data on late BRLNP after thyroidectomy is sparse. Therman et al. reported on 11 cases among 3492 surgical interventions at the thyroid gland showing normal function of both vocal cords immediately after the operation, but developing laryngeal nerve palsy in the following 3 – 4 days. (3) This pathology may be underestimated since laryngoscopy is usually performed early after thyroidectomy. Data on the optimal timing of postoperative laryngoscopy is

sparse and favors an early examination 48 hours postoperatively. (4)

The pathogenesis of late BRLNP is largely unknown. Multiple mechanisms may be implicated. These include mechanical damage by compression or stretching during local cicatrization, perineural devascularisation during inflammatory remodeling, or direct affection by postoperative inflammatory processes.

In the pediatric population, hypocalcaemia constitutes an important cause for stridor and respiratory distress due to laryngospasm. (5) There are several reports on stridor secondary to hypocalcaemia laryngospasm also in the elderly population. (6) In our patient, laboratory analysis revealed the presence of severe hypocalcaemia at admission to the emergency room. Thus, hypocalcaemic laryngospasm was another important differential diagnosis in our case. Hypocalcaemia is a frequent condition after thyroidectomy occurring transiently in up to 50% of patients. However, after adequate calcium substitution, vocal cord immobility persisted, thus excluding a hypocalcaemia origin.

Emergency treatment of BRLNP requires acute airway protection. Orotracheal intubation in the emergency setting may prove difficult due to the paramedian position of vocal cords, and tracheostomy may be necessary. Depending

on the body mass index, the presence of comorbidity and the usual physical activity, patients with BRLNP suffer from various degrees of dyspnea. Four to 14 % of patients tolerate this condition. Almost two thirds of dysfunctional vocal cords recover spontaneously within 4 weeks after thyroidectomy. (7) If no spontaneous restitution of the RLN function develops, microscopic endoscopic laryngeal surgery may restore airway patency and achieve decannulation.

Conclusion

In the above report we show that late onset palsy of the RLN should be included in the differential diagnosis in patients suffering from severe respiratory distress and presenting recent history of thyroid surgery. In European countries, clinicians favor a hospital stay for at least 72 hours after thyroidectomy in order to rapidly detect and treat potential complications. However, many authors, especially in the United States, advocate for thyroidectomy in a short-stay or out-patient setting. Under increasing economic pressure in health systems worldwide, the length of the hospital stay after thyroid surgery will shorten and emergency physicians will be increasingly confronted to postoperative complications of thyroid surgery.

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