Streptococcal Toxic Shock Syndrome after Thyroid Lobectomy: Case Report and Literature Review

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Abstract

Background: Group A streptococcal (GAS) infection after thyroid surgery is a rare occurrence. Its incidence has not been described in the literature.

Methods: This report presents an overview of streptococcal toxic shock syndrome in order to improve the management of the condition and the patient outcome.

Results: A case of GAS toxic shock syndrome secondary to an inadvertent tracheal perforation during a thyroidectomy is presented.

Conclusion: Rapid and thorough diagnosis is essential and all surgeons must have a high index of suspicion for this rare but concerning disease.

THE OVERALL COMPLICATION RATE after thyroid surgery is less than 5%, which is primarily associated with airway complications in big goiters. A recent publication showed that mortality after thyroidectomy is 0.06%, and only 10% is caused by sepsis [1].

Thyroid surgery is considered a clean procedure. The incidence of surgical site infection (SSI) following a thyroidectomy is less than 3% [2–4], therefore antibiotic prophylaxis is not recommended according to international guidelines [5]. The global incidence of SSI caused by group A streptococcal (GAS) is 8.3% [6] and the overall fatality rate after the infection is 13% [7]. Symptoms and signs are similar to any other SSI: Flu-like symptoms, confusion, erythema and induration, suppuration, and pain and fever.

Case Presentation

A 44-year-old female with no past medical history was referred to the division of endocrine surgery for examination of a unique thyroid nodule of 10 mm in diameter on the right lobe, diagnosed by ultrasound (US). Fine needle aspiration guided by US was performed and the cytological examination revealed a suspicious Hürthle cell neoplasm

(Bethesda IV). The patient underwent a right thyroid lobectomy and isthmectomy. No pre-operative prophylactic antibiotics were administered. The surgery followed the aseptic technique and the patient did not receive corticosteroids intra-operatively. Drains were not used and the patient was discharged on post-operative day 1 without any complications.

On post-operative day 2 the patient came to the emergency department with fever (38.5°C) dysphagia, dysphonia, and dyspnoea. Computed tomography (CT) was normal but she presented systemic inflammatory response syndrome secondary to sepsis. She was taken to the operating room (OR) urgently to perform a debridement by a cervical incision, which drained cloudy liquid. There was no extension into the mediastinum and initially there was no evidence of tracheoesophageal injury. A penrose drain was placed. The patient was admitted to the intensive care unit (ICU) with respiratory distress requiring respiratory and nutritional support (Fig. 1). The microbiology report diagnosed a GAS infection based on positive blood cultures, thus the patient received antibiotic coverage with penicillin G. On post-operative day 10, an air leak was observed at the surgical site. The investigation of the leak was

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FIG. 1. Regional erythema evolution. (A) Day 1 ICU; (B) Day 4 ICU.

FIG. 2. Bronchoscopy. A) Tracheal fistula; B) Temporary prosthesis.

completed by bronchoscopy showing a tracheal fistula of 4 mm, 2 cm above the vocal cords. A temporary prosthesis was placed (Fig. 2) and recovery was uneventful until discharge (post-operative day 13) (Fig. 3). The endotracheal prosthesis was withdrawn 1 wk later. After 2 mo of

follow-up, a new bronchoscopy was performed, which showed complete healing of the fistula track (Fig. 4) and the surgical site (Fig. 5).

Discussion

We present a rare case of GAS toxic shock syndrome secondary to an inadvertent tracheal perforation during a thyroidectomy.

A GAS toxic shock syndrome one or two days after clean surgery is a rare occurrence. Cone et al. [8] was the first group to describe GAS toxic shock syndrome in the 1980s. It was defined as the presence of hypotension plus two of the following: Respiratory distress syndrome, renal failure, coagulation abnormalities, and hepatic dysfunction [9]. Its incidence and mortality has not been described in the literature. To date, there are only 11 cases of GAS infection after thyroidectomy reported in the literature (Table 1) [1, 10–15], and many of these cases were complicated by septic shock and death despite early systemic antibiotic treatment. However, there are no cases with GAS infection secondary to tracheal perforation, as we present here. In addition, the reported incidence of tracheal perforation is as low as 0.06% in an extensive review of more than 11,000 thyroidectomies [16].

FIG. 3. Day before patient discharge.

TABLE 1. REVIEW OF PATIENTS WITH GAS INFECTION AFTER THYROIDECTOMY

Case no.	Author	Year, country	Age (y), gender	Post-operative day	Toxic shock syndrome	Tracheal injury	Outcome
1	CDC	1996, US	28, Female	1	Yes	No	Death
2	CDC	1996, US	56, Female	1	Yes	-	Death
3	CDC	1996, US	57, Female	2	Yes	No	Survival
4	Szczypa	2001, Poland	55, Male	2	Yes	-	Death
5	Faibis	2001, France	61, Female	2	No	No	Survival
6	Faibis	2003, France	58, Female	2	Yes	No	Death
7	Faibis	2004, France	36, Female	2	Yes	No	Death
8	Hardy	2007, UK	38, Female	1	Yes	No	Death
9	Nikolaos	2007, Greece	47, Female	2	Yes	No	Survival
10	Karlik	2013, US	47, Male	2	Yes	No	Survival
11	Gómez-Ramírez	2015, Spain	37, Female	2	Yes	-	Death

FIG. 4. Bronchoscopy after 2 mo. Healing of the fistula track.

FIG. 5. Surgical cite after 2 mo.

GAS colonization could be detected before surgery, but routine testing is not usually performed. If there is suspicion of a severe neck infection after thyroid surgery, a CT should be performed to reveal the existence and the extent of the infection. There are only two cases reported in the literature of necrotizing mediastinitis because of the descending of GAS SSI [13, 17], but this is a possible complication. The definitive diagnosis of GAS infection is based on positive blood cultures but only 60% of patients have bacteremia [7]. However, any suspicion of GAS infection should be treated with high doses of penicillin and debridement. Follow-up CT is important also after first debridement because in some cases an additional operation is required.

Conclusions

The detection of the first signs of post-operative complications and identification of a GAS infection is crucial in order to prevent a fatal outcome. Inadvertent tracheal perforation should also be avoided by all surgeons after thyroidectomies because of a high association with GAS infection.

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Author Disclosure Statement

The authors declare that they have no competing interests.

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Abbreviations Used

CT = computed tomography
GAS = group A streptococcal
ICU = intensive care unit
US = ultrasound

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