

Thyroid Abscess with Extensive Retropharyngeal Extension successfully treated with open Gravitational Drainage

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ABSTRACT

Thyroid abscess is a very rare condition comprising 0.1-7% of thyroid-related surgical cases. The common causative organisms are staphylococcus and streptococcus species. Thyroid abscess can be treated with antibiotics and surgical intervention. We reported a case of thyroid abscess with a large retropharyngeal extension in a 59 year-old gentleman who was successfully treated with antibiotics, neck exploration, left hemithyroidectomy and gravitational drainage.

Keywords: Abscess, Acute suppurative thyroiditis, Mediastinum, Retropharyngeal Abscess, Thyroidectomy

INTRODUCTION

Thyroid infection or abscess is a rare medical condition, partly because of the high concentration of iodinated colloid compounds in the gland and its vascularity. Congenital third or fourth branchial arches anomalies are the commonest cause of thyroid abscess in children.¹ Other causes include trauma with neck injuries, recent thyroid surgery, immune-compromised patients or patients with pre-existing thyroid pathology and bacterial infection, either from haematogenous or lymphatic spread and the commonest causative organisms are staphylococcus and streptococcus.^{1,2} We reported a case of thyroid abscess with a large retropharyngeal extension in a 59 year-old gentleman who was successfully treated

with antibiotics, neck exploration, left hemithyroidectomy and gravitational drainage.

CASE REPORT

A 59 year-old gentleman presented with painful left sided neck swelling associated with fever for one week, dysphagia and muffled voice. There was no sign of respiratory distress. Patient has adult onset type 2 diabetes mellitus, which was well controlled with treatment. There were no symptoms of hyperthyroidism or hypothyroidism.

On examination, body temperature was 37.8°C. Neck examination revealed a tender left sided neck swelling measuring 4x3cm at the level of thyroid gland. Indirect laryngoscopy showed fullness of the left lateral and posterior pharyngeal wall obliterating the left pyriform fossa. The overlying mucosa

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and epiglottis were normal and both vocal cords were mobile.

Total white blood count was raised at $21 \times 10^9/L$, with a predominantly neutrophilic picture. Blood sugar level was raised at 19.6mmol/L. Serum free thyroxine level was high at 55.9 pmol/L. Blood cultures were taken but was negative for bacterial growth after 48 hours. An initial lateral neck x-ray revealed widening of the pre-vertebral space extending inferiorly from the fourth cervical vertebra to thorax.

Computed tomography of neck and thorax revealed multiple hypodense lesions within the left thyroid gland, which was in continuity with a large retropharyngeal collection at its superomedial aspect, which extended to retro-esophageal space and posterior mediastinum up to the level of left main bronchus and anterior to descending aorta. There was no evidence of any foreign body in the thyroid gland or any features of multinodular goiter.

Direct laryngoscopy with neck exploration were performed. Intraoperatively, the left thyroid gland was inflamed and friable, resulting in a spontaneous rupture of the abscess at the posterior surface during dissection of the gland. Extension of the abscess posteriorly was traced to a defect into the retropharyngeal space and down along retro-esophageal space. Left hemithyroidectomy was performed to facilitate drainage of the abscess from retropharyngeal space. Patient was then positioned in 30° Trendelenburg position for gravitational drainage of retropharyngeal and posterior mediastinum abscess. Corrugated drain was inserted at the left thyroid bed and in the retropharyngeal area.

Post operatively, patient was kept intubated and nursed in 30° Trendelenburg position with two-hourly chest percussion to assist drainage of posterior mediastinum ab-

scuss. Intravenous ceftriaxone 2g daily and metronidazole 500mg tds were continued and patient was extubated two days later once pus drainage has reduced and the wound showed improvement. Flexible nasopharyngolaryngoscopy revealed resolution of the bulge previously seen at the left lateral and posterior pharyngeal wall. There was no vocal cord palsy.

Pus culture grew *Streptococcus* species which was sensitive to ceftriaxone. Histopathological examination of the thyroid abscess wall showed large area of necrosis filled with necrotic materials and neutrophils. There was no evidence of malignancy seen. His subsequent recovery was uneventful and was discharge after one month of hospitalization. His last follow up was six months post-operative and he was doing well.

DISCUSSION

Thyroid abscess accounts for only 0.1-0.7% of surgically treated thyroid pathologies.³ The rarity of thyroid abscess are due to the innate protective properties which are its thick capsule, iodine-rich environment, rich blood supply, anatomically separated from other structure in the neck by fascial planes and generation of hydrogen peroxide as a requirement for the synthesis of thyroid hormone.⁴ The commonest cause of thyroid abscess in children are congenital anomalies of the hypopharyngeal region leading to pyriform sinus fistula formation.^{1,5} They usually present with history of recurrent inflammatory events and barium contrast study shows evidence of fistulous tract.⁵ In adults, thyroid abscess can result from direct trauma from foreign bodies, oropharyngeal infection, infection from neighbouring structures and pre-existing thyroid pathologies.⁶ A few cases of thyroid malignancy presented with thyroid abscess have also been also reported.⁷⁻⁹

Hematogenous and lymphatic spread

of infection from a remote area can also cause thyroid abscess formation especially in patients with systemic disorder and compromised immunity.^{1,2} Infections within the gland with abscess formation which subsequently breached its capsule and overlying fascia can result in local extension of the infection into the retropharyngeal space in the neck, as with our case.¹ The commonest pathogens in thyroid abscess are *Staphylococcus aureus* and *Streptococcus pneumoniae*. Besides that, *Escherichia coli*, *Bacteroides*, *Salmonella*, *Acinetobacter* and *Klebsiella* species. *Mycobacteria* and fungi have been well documented.¹⁰

Frequently thyroid abscess presented with preceding history of upper respiratory tract infection. Clinical presentation of thyroid abscess may include fever, dysphagia, painful neck swelling, skin erythema, hoarseness or muffled voice, and if airway is compromised, patient can present with shortness of breath or stridor. Symptomatic thyrotoxicosis may occur due to increase release of thyroid hormone in the blood stream from increase vascularity from the infection. Thyroid abscess must be quickly diagnosed and managed or it can potentially result in septicaemia, vocal cord paralysis, retropharyngeal and mediastinum abscess.² If left untreated, particularly with anaerobic infection may spread and cause thrombophlebitis of the internal jugular vein, a condition called Lemierre's syndrome (post-anginal septicaemia).¹¹ Infectious mononucleosis have also been reported in adolescents presenting with thyroid abscess.¹¹ Thyroid malignancy also has to be ruled out in view of reported cases of thyroid malignancy presenting as thyroid abscesses.^{7,8}

Management of thyroid abscess includes administration of broad spectrum antibiotics and immediate surgical intervention. Empirical broad-spectrum antibiotic therapy should be initiated early and this can be changed once sensitivity profile is available.

Image guided serial aspiration or incision and drainage for managing unruptured thyroid abscesses have been reported to be fairly effective but in some cases, thyroidectomy may be required, particularly in recurrent thyroid abscesses associated with pyriform sinus, pre-existing thyroid disease and suspicion of thyroid malignancy.^{1,5,6,12,13} Partial thyroidectomy has also been reported to prevent inflammatory neuritis of recurrent laryngeal nerve.¹³

Abscess from head and neck region can spread inferiorly to mediastinum through the retropharyngeal space causing of mediastinitis. It is a life threatening condition with 20-40% of mortality rate.¹⁴ Treatment of mediastinal abscess includes broad spectrum antibiotics and adequate drainage. A combination of trans-cervical and trans-thoracic mediastinal drainage can be considered in patients with mediastinal extension. Some reported that trans-cervical mediastinal drainage alone was sufficient in cases of localized infection limited to superior mediastinum and a combined approach is recommended in patients with extensive mediastinal infection beyond the level of carina.¹⁵ Trans-thoracic approach provides adequate exposure of all mediastinal compartments to achieve optimum drainage but is a more invasive procedure than trans-cervical mediastinal drainage and with risk of pleural contamination. Median sternotomy is an alternative approach for draining anterior mediastinal abscess but the disadvantages are inadequate exposure of visceral compartment and risk of osteomyelitis.¹⁵

Left hemithyroidectomy was performed in our case and the abscess was drained from the left thyroid bed, which was in continuity with the retropharyngeal space and patient was put in Trendelenburg position to facilitate gravitational drainage of the posterior mediastinal abscess. Posterior mediastinal abscess was adequately drained via two-hourly gravitational drainage with chest percussion. The advantage of this method is

that it is less invasive than the trans-thoracic approach. A few physiological changes may occur as a setback which are the orthostatic effect of the cardiovascular system with raised central venous pressure with facial and body congestion, splinting of diaphragm and also risk of aspiration as gastric juice, saliva and mucous will be collected in the nasopharynx and oropharynx. However, measures have been taken to monitor the condition of the patient with central venous pressure monitoring, optimizing ventilator setting and placement of Ryle's tube to prevent aspiration.

CONCLUSION

Thyroid abscess is a rare disorder, which if not treated early can extend to posteriorly into the retropharyngeal space and downward into the mediastinum. Successful management of thyroid abscess with extensive retropharyngeal and retrosternal involvement includes a combination of antibiotic therapy, radiological or surgical neck exploration and drainage with post-operative gravitational drainage as in this case can avoid a more invasive thoracotomy or median sternotomy. Partial thyroidectomy may be required particularly if the gland is completely damaged or if malignancy is suspected.

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