

Thyroid Abscess Secondary to Perforated Carcinoma of the Oesophagus: A Rare Presentation

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Citation

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Abstract

Thyroid abscess is a rare condition of the thyroid gland. The common causative organisms responsible for thyroid abscess are Staphylococci and Streptococci species. Rarely Klebsiella pneumoniae, Salmonella typhi, Salmonella Brandenburg and Eikinnella corrodens also have been isolated in individual cases as the causative organism. Early biopsy and cultures are needed. Thyroid abscess is successfully treated with immediate surgical intervention and appropriate antimicrobial agents. We describe a case of thyroid abscess secondary to oesophageal perforation following carcinoma of the oesophagus. Klebsiella was the organism isolated. The patient was treated with open surgical drainage and appropriate antimicrobial agents along with a feeding jejunostomy.

INTRODUCTION

Acute thyroid abscess is rare. Many sources of infection have been reported, including haematogenous and lymphatic spread, direct penetration from adjacent structures (such as an internal fistula or thyroglossal duct), thyroid surgery and neck injuries.^[1] A review of the literature, however, revealed no reports of thyroid infection associated with oesophageal perforation following carcinoma of the oesophagus. Pre-existing thyroid disease is also a known predisposing factor in adults, including longstanding thyroid goiter and thyroid malignancies.^[2] Diabetes mellitus and immunosuppression may also precipitate thyroiditis. Organisms commonly responsible for bacterial thyroiditis are those that colonize the skin and oropharynx. Staphylococcus aureus is the most common organism cultured from thyroid abscesses.^[3] Thyroid abscess must be quickly diagnosed and managed or it can result in complications, such as septicaemia, vocal cord paralysis, retropharyngeal abscess and suppurative mediastinitis.^[1] Fulminate cases may also lead to osteomyelitis or septic thrombophlebitis. Early biopsy and cultures are needed for prompt antimicrobial therapy. Surgical drainage is required for a large abscess.^[4]

CASE REPORT

A 50-year-old female patient was admitted with chief complaints of swelling in front of the neck for 20 days and difficulty in swallowing for 5 days.

Initially, she developed a swelling of size 5 x 4cm, sudden in onset and gradually progressive in nature to attain its present size. She had associated sudden increase in size for 5 days, difficulty in swallowing and shortness of breath. There was history of weight loss. On examination, a swelling of size 8 x 5cm was present in front of the neck with well defined borders and extending between the medial borders of the sternocleidomastoid muscle. It was moving with deglutition and not moving with protrusion of the tongue. The overlying skin was stretched, tense, glistening, and not pinchable. On palpation, it was a tense and tender swelling with a well defined lower border and local rise of temperature. Ultrasonography of the neck showed a 6.3 x 3.8cm large heterogeneous lesion consisting of air foci, occupying both lobes, displacing the bilateral carotids and internal jugular veins laterally. The features were suggestive of thyroid abscess and level 2A lymphadenopathy on the left side. The computerised tomography scan (CT scan) was suggestive of thyroid abscess involving the right lobe of the thyroid gland. There was an extension of the abscess in the retropharyngeal space and there was also presence of air in the abscess [Figure 1 & 2].

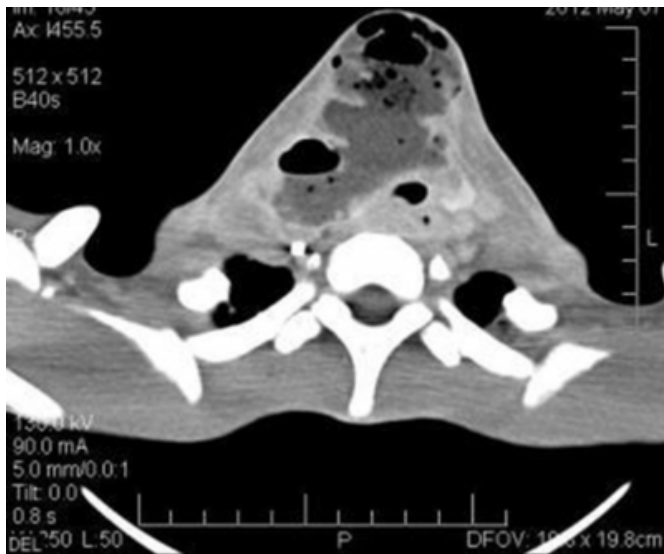
Figure 1

Figure 1: CT scan suggestive of thyroid abscess involving the right lobe of the thyroid gland.



Figure 2

Figure 2: CT scan suggestive of thyroid abscess with extension of the abscess in the retropharyngeal space; there was also presence of air in the abscess.



Fine-needle aspiration cytology done in an outside laboratory one day prior to admission in our hospital was suggestive of suppurative inflammation with squamous cells, compatible with an infected epidermoid cyst in the anterior neck region. Blood investigations were within normal limits except for complete blood picture (CBP) which revealed anaemia [Hemoglobin {Hb} -7.2 gm %]. Preoperatively, one unit blood was transfused. Otorhinolaryngology referral was done where movement of vocal cords could not be made out

due to overlying epiglottis and secretions. The case was posted for emergency incision and drainage under general anaesthesia.

Operative findings were as follows:

- 1) The abscess was in front of neck, extending into the right retropharyngeal space and right thyroid.
- 2) About 100ml pus was drained out.
- 3) A part of the strap muscles were necrosed [Figures 3, 4, 5].

Figure 3

Figure 3: Thyroid abscess involving the right lobe of the thyroid gland.



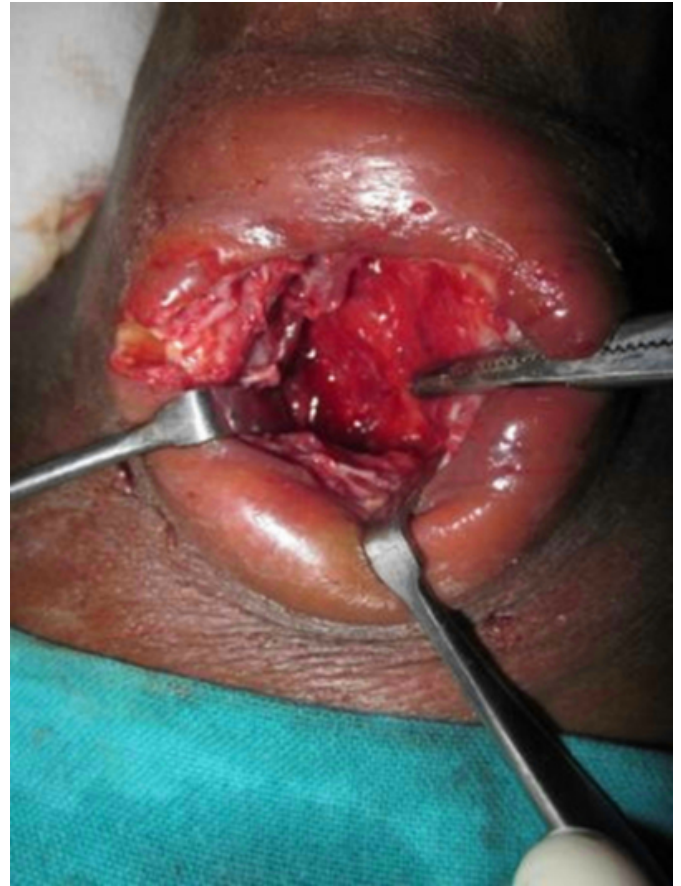
Figure 4

Figure 4: Pus drained out, after draining the thyroid abscess.



Figure 5

Figure 5: Destroyed right lobe of the thyroid gland and the cavity of the thyroid abscess.



Pus was sent for culture and sensitivity. On the 1st postoperative day [POD 1] liquid diet was started orally. The patient complained of fluids coming out of the wound on ingesting fluids orally. A surgical gastroenterologist consultation was taken and she was advised: 1) Gentle endoscopy to rule out distal obstruction. 2) Feeding jejunostomy. 3) Nil by mouth till the oesophageal fistula closes. 4) Supportive care and antibiotics.

An upper gastrointestinal endoscopy showed a postcricoid web and an inflammatory edema of the upper oesophagus because of which the scope could not be passed beyond. On the fourth postoperative day, a feeding jejunostomy and a biopsy from the upper oesophagus were done. Operative findings showed that the omentum was inflamed and about 500ml of ascitic fluid was tapped. Rigid esophagoscopy revealed an ulceroproliferative growth seen in the upper end of the esophagus which was biopsied and sent for histopathological examination. Histopathological diagnosis was squamous cell carcinoma of the oesophagus (Figures 6

and 7).

Figure 6

Figure 6: Photomicrograph [10x] showing a fragment of atypical squamous epithelial cells amidst the inflammatory cells (Hematoxylin & Eosin).

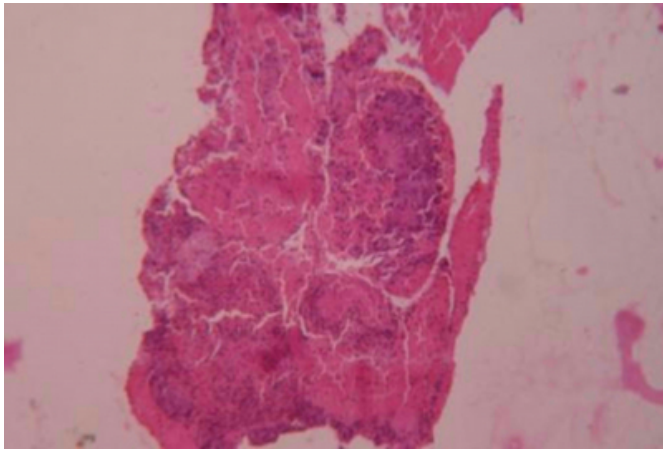
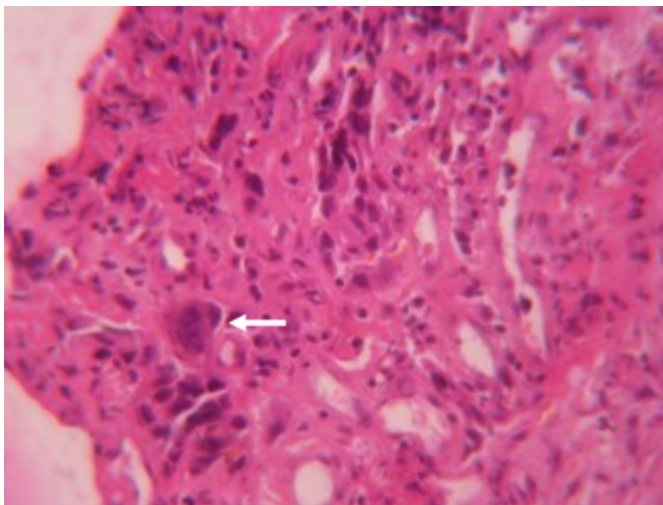


Figure 7

Figure 7: Photomicrograph [40x] showing bizarre squamous cells with hyperchromatic nuclei, prominent nucleoli and scanty eosinophilic cytoplasm (Hematoxylin & Eosin).



The culture and sensitivity report showed *Klebsiella* species sensitive to Ofloxacin and intravenous Ofloxacin was started. Peritoneal fluid analysis showed a normal picture. Adenosine deaminase (ADA) was 12.5 μ l, i.e. normal. The patient was discharged on the 14th postoperative day with the advice of feeding through the feeding jejunostomy. She was referred for further management of the oesophageal carcinoma.

DISCUSSION

Acute suppurative thyroiditis (AST) is a rare clinical disease and an uncommon form of thyroiditis. The progression of the condition to thyroid abscess is unusual.^[5] Acute thyroid abscess is a rare condition due to the widespread use of antibiotics, with a frequency of approximately 0.1 - 1% of surgical

thyroid disorders. Although reported in both children and the elderly, it is more common in women between the ages of 20 and 40 years.^[6]

The thyroid gland possesses some characteristics that make thyroid abscess an uncommon clinical event. The normal thyroid gland, being enclosed in a firm capsule having no excretory duct and a low functional activity, is protected against the invasion of organisms unless introduced through the blood-supply.^[7] The features protecting against the development of thyroid abscess include total encapsulation of the gland, its secluded anatomic position, an iodine-rich environment, extensive lymphatic drainage, and good blood flow from the superior and inferior thyroid arteries. These hinder the invasion of bacteria and their subsequent growth.^[5]

A tender thyroid lesion is helpful to clinch the diagnosis of AST but other causes of a tender thyroid should be kept in mind. They include de Quervain thyroiditis (the commonest cause of a painful thyroid), acute hemorrhage into a cyst or thyroid nodule, a rapidly enlarging thyroid carcinoma, or radiation thyroiditis.^[5]

Many routes of infection that lead to involvement of the thyroid gland have been reported. The route of infection may be hematogenous or lymphatic seeding or may occur directly from the oropharynx, contagious cervical tissue, esophagitis, foreign bodies or patent thyroglossal duct fistula.^[8] Acute suppurative thyroiditis especially affects patients with preexisting thyroid gland pathology, and in childhood it is associated with local anatomic defects.^[7] A congenital pyriform sinus fistula (it is arising from the pyriform fossa with the tract ending in the parenchyma of the thyroid or perithyroid soft tissues) related to fourth branchial pouch remnants is the most frequent reason for recurrent thyroid abscess in children.^[9] These infections occur due to the accumulation of contaminated secretions in the pharynx, usually after upper respiratory tract infections or middle-ear infections.^[3] They respond well to fistulectomy, drainage and antibiotics.

Abscess development secondary to direct trauma from foreign bodies, such as fine-needle aspiration, fishbone, and chicken bone penetration, have been described, as well as extension from neighboring anatomic structures.

AST has also been associated with immunosuppression, especially human immunodeficiency virus. Sources believed to have hematogenously seeded to the thyroid include pilonidal abscesses, infections of the hand, and possible inoculation from intravenous drug abuse.^[10]

Since 1950, Schweitzer and Olson noted that only 39 cases of thyroid abscess have been reported in the medical literature. Out of the 39 cases of abscess, 16 were in children. Concomitant tubercular and cryptococcal as well as gram negative infections have been reported.^[3]

Thyroid abscesses are single or multiple. The left side of the thyroid is more commonly involved than the right in cases with an abscess. Children and adults have painful swelling in the anterior lower neck accompanied by fever that is usually preceded by a sore throat. Adult patients with this condition often have a history of repeated upper respiratory tract infection and sore throat.^[7]

Suppurative thyroiditis is always of microbial origin. In cases where a thyroid abscess is formed, the offending organisms include gram positive pathogens such as *Staphylococcus aureus*, *Streptococcus* sp. and anaerobes of the oropharyngeal area. There have been reports in literature where *Klebsiella pneumoniae*, *Salmonella typhi*, *Salmonella Brandenburg* and *Eikenella corrodens* have been isolated in individual cases as the causative organism.^[7] Many other organisms such as *Aspergillus*, *Brucella* and *Acinetobacter* have been identified in infection of the thyroid gland and often the infection is polymicrobial.^[5] *Escherichia coli*, *Pseudomonas aeruginosa* and *Haemophilus influenzae* and occasionally anaerobic bacteria have been rarely isolated.^[1] Organisms isolated in immunosuppressed patients are *Acinetobacter*, *Coccidioides*, *Pseudomonas*, *Clostridium*, *Nocardia*, *Pneumocystis carinii*, *Haemophilus*, and *Candida* species.^[10] *Escherichia coli* and *Bacteroides fragilis* may originate from perineal infections.^[11] Duraker, et al., have reported *Salmonella* to cause vocal cord paralysis in a patient presenting with stridor and thyroid abscess.^[12] However, mycobacteria and fungi have also been documented.^[13,14] Rarely, Lemierre's syndrome (post-anginal septicemia due to anaerobes) and infectious mononucleosis in adolescents have been reported with thyroid abscess.^[15]

The present abscess was caused by *Klebsiella pneumoniae* which is a common hospital-acquired pathogen though it may also be a community-acquired pathogen. Only four other cases of thyroid abscess due to *K. pneumoniae* have been reported in the English literature. The antibiotic treatment should be based on the antibiotic susceptibility testing of individual isolates.

Clinical signs include tenderness of the gland, dyspnea, pain, hoarseness, dysphagia, fever, and chills.^[5] With suppuration and enlargement of the mass, the skin becomes warm and erythematous. Hoarseness of the voice is frequently present. If thyroid abscess is not diagnosed and managed quickly, complications such as septicemia, retropharyngeal abscess, tracheal or oesophageal rupture, internal jugular vein thrombosis, vocal cord paralysis, osteomyelitis or septic thrombophlebitis and suppurative mediastinitis may occur.^[1]

Plain x-rays of the neck may show tracheal displacement, ultrasonography and computerized tomography may identify the underlying structure and extent of the abscess.^[5] The presence of thickened soft tissue and gas in the retropharyngeal space or anterior cervical region on radiography is highly suspicious of a deep neck infection or abscess formation.^[1] A fine-needle aspiration to confirm the diagnosis of thyroid abscess and to determine the responsible organism and its antibiotic susceptibility can be performed.^[5] Once the diagnosis has been made, therefore, medication and surgical intervention should be initiated urgently.

In the present case, the prime cause of infection of the thyroid tissue was from a perforated carcinoma of the oesophagus, with the infection spreading to the thyroid via the tracheo-oesophageal groove. As far as we are aware, this is the first such case reported in the English literature.

Management involves surgery with either lobar excision or debridement, incision and drainage, resection of a fistulous connection if applicable, combined with culture-appropriate antibiotics.^[9] Broad-spectrum antibiotic therapy covering aerobic, anaerobic, and oral flora should be started early after obtaining a specimen for microbiological studies and this can be changed when the sensitivity profile is available.^[5] Because this disease entity is rapidly progressive and often delayed in its presentation, early recognition and intervention are necessary to curtail the morbid potential of the complications of this process.^[9]

Boyd et al.^[16] proposed that the abscess may merely be incised and drained, avoiding a thyroidectomy in already

inflamed tissue. One disadvantage of this technique is that it leaves an inflamed thyroid gland in close proximity to the source(s) of infection. Myssiorek et al.^[17] suggested that at least the affected part of the thyroid should be resected, because the abscess might directly compress the recurrent laryngeal nerve and cause inflammatory neuritis, which might induce vocal cord paralysis.

In our case we only drained the abscess, to avoid handling the inflamed tissue. We gave broad spectrum antibiotics sensitive to Klebsiella. Later, as the fistula was noted secondary to perforated oesophageal carcinoma, a feeding jejunostomy was done and management was directed to treat the carcinoma of the oesophagus.

CONCLUSION

Thyroid abscesses may originate from surrounding sepsis or anatomic abnormality or spread from a local/distant site. When a patient presents with a tender mass in the thyroid region, we strongly recommend ultrasound examination of the neck, in order to distinguish an intrathyroid from an extrathyroid process. Early biopsy and cultures are needed for prompt antimicrobial therapy. Bacteria may spread via a hematogenous route and can produce positive blood cultures. Thyroid abscess is successfully treated with immediate surgical intervention by complete excision of the suppurated tissues along with underlying thyroid pathology and appropriate antimicrobial agents.

References

1. Lin ZH, Teng YS, Lin M: Acute thyroid abscess secondary to oesophageal perforation. *The Journal of International Medical Research*; 2008; 36: 860 – 864.
2. Sai Prasad TR, Chong CL, Mani A, Chui CH, Tan CE, Tee WS, Jacobsen AS: Acute suppurative thyroiditis in

- children secondary to pyriform sinus fistula. *Pediatr Surg Int*; 2007; 23(8): 779-83.
3. Paramhans D, Ankur B, Mathur RK: Thyroid abscess associated with a longstanding multinodular goiter: a case report. *World Articles in Ear, Nose and Throat*; 2010; Vol. 3-1
4. Tien KJ, Chen TC, Hsieh MC, Hsu SC, Hsiao JY, Shin SJ, Hsin SC: Acute suppurative thyroiditis with deep neck infection: a case report. *Thyroid*; 2007; 17(5): 467-9.
5. Adeyemo A, Adeosun A and Adedapo K: Unusual cause of thyroid abscess. *Afr Health Sci*; 2010; 10(1): 101–103.
6. Singer PA: Thyroiditis: Acute, subacute, and chronic. *Med Clin North Am*; 1991; 75: 61 - 67.
7. Ozdemir CS, Sozen S, Banli O: Acute neck infection due to thyroid abscess. *Eur J Gen Med*; 2011; 8(2): 144-7.
8. Sicilia V, Mezitis S: A case of acute suppurative thyroiditis complicated by thyrotoxicosis. *J Endocrinol Invest*; 2006; 29(11): 997-1000.
9. Cases JA, Wenig BM, Silver CE, et al.: Recurrent acute suppurative thyroiditis in an adult due to a fourth branchial pouch fistula. *Clin Endocrinol Metab*; 2000; 85: 953 - 956.
10. Herndon MD, Christie DB, Ayoub MM, Duggan AD: Thyroid abscess: case report and review of the literature. *Am Surg*; 2007; 73(7): 725-8.
11. Fraisse TC, Ferreira E, Lechiche C, Le Moing V, Reynes J: *Escherichia coli* thyroid abscess associated with multinodular goiter. *Rev Med Interne*; 2006; 27(3): 258-60.
12. Duraker N, Agac E, Ozpacaci T: Thyroid abscess caused by *Salmonella typhi* leading to vocal cord paralysis. *Eur J Surg*; 2000; 166(12): 971-3.
13. Kang M, Ojili V, Khandelwal N, Bhansali A: Tuberculous abscess of the thyroid gland: a report of two cases. *J Clin Ultrasound*; 2006; 34(5): 254-7.
14. Cevera JJ, Butehorn HF 3rd, Shapiro J, Setzen G: Actinomycosis abscess of the thyroid gland. *Laryngoscope*; 2003; 113(12): 2108-11.
15. Kara E, Sakarya A, Keles C, Borand H, Pekindil G, Goktan C: Case of Lemierre's syndrome presenting with thyroid abscess. *Eur J Clin Microbiol Infect Dis*; 2004; 23(7): 570-2.
16. Boyd CM, Esclamado RM, Telian SA: Impaired vocal cord mobility in the setting of acute suppurative thyroiditis. *Head Neck* 1997; 19: 235-237.
17. Myssiorek D, Lee J, Shikowitz M, et al.: Immobile vocal fold secondary to thyroid abscess: a case report. *Ear Nose Throat*; 2000; 79: 453-455.

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