

An Interesting Case of *Sphingobacterium* *Multivorum* Neck Abscess

Abstract:

Soft tissue infections due to gram negative microorganism are very rare. *Sphingobacterium* related respiratory tract infections, cellulitis, necrotizing fasciitis and septic shock have been reported in literature mostly in immunosuppressed population. We present an interesting and rare case of neck abscess due to *sphingobacterium multivorum* in an immunocompetent patient, diagnosed by abscess fluid culture and neck imaging and treated with course of oral antibiotics.

Keywords: *Sphingobacterium*, abscess, poor oral hygiene

Introduction:

Sphingobacterium species are catalase and oxidase positive, non- lactose fermenting gram-negative organism characterized by presence of large number of cell membrane sphingophospholipids. *Sphingobacterium* species are ubiquitous and isolated from natural environments, such as soil and water. Only limited number of cases have been reported in the literature about *sphingobacterium* associated chronic respiratory tract infections, cellulitis, necrotizing fasciitis, septic shock in the elderly and immunocompromised patients with underlying comorbidities and predisposing factors. We present a case of 35 years old fairly healthy male with neck abscess due to *sphingobacterium*.

Case Description:

35 years old caucasian male with ongoing smoking and past medical history of hepatitis C infection and gastroesophageal reflux disease presented at an outside hospital with complaints of sudden onset of sore throat for one day which was associated with dysphagia. He denied fever, chills, cough, night sweats, weight loss, appetite changes, nausea, vomiting, diarrhea, constipation, shortness of breath, facial pain, muscle aches, joint pain, skin rash, headache and any sick contacts. On admission, vitals were normal. Physical examination was significant for 2 x 3 cm mobile tender and ballottable anterior neck swelling over the thyroid cartilage with no redness of the overlying skin, no ulceration and discharge. Patient had poor dental hygiene but no oral thrush or ulcers. Labs showed normal blood counts, kidney and liver functions. Computed tomography scan of the soft tissue neck revealed multiloculated fluid collections of 1.7 x 3.0 cm in the anterior neck extending into the vallecula and piriform sinus on the left [Figure 1]. Patient was transferred to our hospital and started on piper/taz and vancomycin empirically. Patient initially had improvement in sore throat and neck pain after aspiration of 7 ml of dark brown fluid from the neck mass. Patient had swelling of aryepiglottic fold and complete obliteration of left of piriform sinus on flexible laryngoscopy performed by ENT. Repeat CT neck soft tissue showed minimal interval enlargement of superinfected thyroglossal duct cyst with adjacent soft tissue edema and moderate airway narrowing from prior examination with high risk of laryngospasm [Figure 2 and 3]. Patient

was taken emergently to the operation theater for direct laryngoscopy and needle aspiration of another 8 ml of dark brown fluid from bilobed infected neck cyst was performed. Fluid cultures later came back positive for *Sphingobacterium multivorum* sensitive to cephalosporins, imipenem, levofloxacin, and tetracyclines. Patient was switched to oral levofloxacin 500 mg twice daily along with oral clindamycin 300 mg three times a day for 14 days. Patient followed up in infectious disease clinic in 2 week with resolution of neck swelling and associated symptoms.

Discussion:

Soft tissue neck infections are usually polymicrobial commonly originating from the normal mucosal flora of surrounding structures including oral cavity, mandibular teeth, tonsils, parotid gland, deep cervical lymph nodes, middle ear or sinuses and upper respiratory tract. The most common microorganisms isolated are *Streptococcus viridans*, and anaerobes including *Peptostreptococcus* species, *Fusobacterium nucleatum*, *Prevotella* species such as *Prevotella melaninogenica* and *Actinomyces* species. Gram negative deep soft tissue neck infections including *Sphingobacterium* are very rare. *Sphingobacterium* is a catalase and oxidase positive, gram-negative, non-lactose-fermentative microorganism. The genus *Sphingobacterium* consists of six species include *spiritovorum*, *multivorum*, *mizutaii*, *antarcticum*, *faecium* and *thalpophilum* and an important characteristic of this genus is the presence of abundant sphingolipids in the cellular lipid membranes hence the name *sphingobacterium* [1]. They are ubiquitous in nature and rarely cause infections in humans. *Sphingobacterium* species have the ability to survive in moist hospital environments and also can contaminate laboratory culture media. It was thought to be primarily related to opportunistic infections in HIV population and later was considered as a triggering factor for sepsis and death in that population.

There are only few cases of human infections due to *Sphingobacterium multivorum* reported in the literature mostly in the elderly population with many co-morbidities and immunocompromised hosts and include cases of necrotizing fasciitis and septic shock, septic arthritis, bacteremia in immunocompromised hosts, sepsis in the setting of bacteremia in dialysis patient, chronic obstructive pulmonary disease, hypertension and diabetes patients, peritonitis, chronic respiratory tract infection in patients with cystic fibrosis and meningoencephalitis [2-8].

Diagnosis need imaging and cultures with special preparations. Growth on MacConkey agar is usually detectable within 24 hours of inoculation. Computed tomography (CT) is the imaging modality of choice for the diagnosis of deep neck space infections. CT allows evaluation of soft tissues and especially bones with a single exposure.

Management include appropriate selection of antibiotics due to increased prevalence of resistant strains. *Sphingobacterium multivorum* is intrinsically resistant to many commonly administered antibiotics and can cause a life-threatening infection. *S. multivorum* can produce an extended-spectrum β -lactamase and a metallo- β -lactamase, conferring resistance to third-generation cephalosporins and carbapenems [9]. In review of the literature, the three most commonly susceptible antibiotics were TMP/SMX, quinolones and tetracyclines.

There are different complications associated with deep neck infections if left untreated and include dysphagia and odynophagia secondary to inflammation of the cricoarytenoid joints, dysphonia and hoarseness due to involvement of the tenth cranial nerve, unilateral tongue paresis due to involvement of the twelfth cranial nerve and stridor and dyspnea which signify

airway obstruction and may be manifestations of local pressure or spread of infection to the mediastinum.

Our patient was diagnosed with wound cultures from neck abscess aspirate which showed that it was sensitive to cephalosporins, imipenem and fluoroquinolones. He had resolution of symptoms during follow up in the infectious disease clinic after a course of oral antibiotics.

Conclusion:

This case highlights the uncommon presentation of gram negative rods *Sphingobacterium multivorum* as neck abscess in an immunocompetent individual which can be life threatening if left untreated due to the involvement of surrounding structures. Clinicians should consider *Sphingobacterium* as possible cause of localized neck abscess even in immunocompetent patients and should work it up accordingly.

References:

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Images:

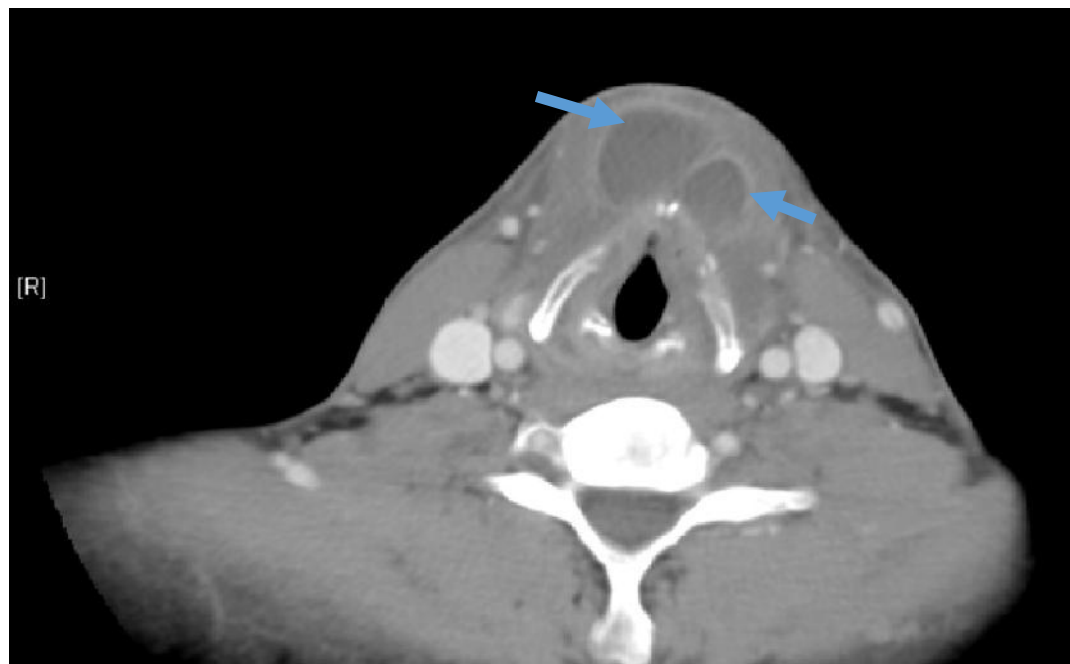
135 **Figure 1:** Computed tomography of soft tissue neck revealed multiloculated fluid collections
136 1.7 x 3.0 cm [Arrow].



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139 **Figure 2:** Repeat CT neck soft tissue showed minimal interval enlargement of neck abscess
140 [Arrows]



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144 **Figure 3:** Repeat CT neck soft tissue showed minimal interval enlargement of abscess
145 [Arrow].



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