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Concurrent Intratonsillar, Peritonsillar, and Retropharyngeal Abscesses: Case Report of Multiple Deep Neck Space Infection

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Keywords
Deep neck infection, intratonsillar, peritonsillar, retropharyngeal, abscess

Abstract
Deep neck space infections are potentially life-threatening conditions due to their proximity to vital structures such as the airway, major blood vessels, and cranial nerves. These infections may spread rapidly and lead to severe complications, including airway obstruction and sepsis. This study aims to describe a rare case of concurrent intratonsillar, peritonsillar, and retropharyngeal abscesses, as well as to evaluate the effectiveness of conservative management using intravenous antibiotics. This research employed a descriptive qualitative case report approach involving a 32-year-old male patient presenting with progressive throat pain, dysphagia, neck swelling, and a muffled voice. Data were collected through clinical examination, laboratory tests, and radiological imaging, followed by continuous observation during hospitalization. The findings revealed elevated leukocyte levels and radiographic evidence of retropharyngeal space widening. The patient was treated with intravenous cefotaxime and metronidazole, along with supportive therapy. Significant clinical improvement was observed within 48 hours, with resolution of symptoms by the fifth day without surgical intervention. In conclusion, early diagnosis and prompt antibiotic therapy can effectively manage selected cases of multiple deep neck abscesses. Conservative treatment may be considered in stable patients, potentially avoiding invasive procedures while ensuring favorable clinical outcomes.

INTRODUCTION

Deep neck infections include all infections located in the potential spaces and fascial plane of the neck within the deep layers of the cervical fascia (Al Riyami, 2025). Deep neck space abscesses are serious infections because they are located close to major vessels, cranial nerves, the airway, and the gastrointestinal tract. The combination of complex neck anatomy and the potential for deep tissue extension makes abscess difficult to detect by external assessment or palpation alone (Almuqamam et al., 2024). A study of 162 patients in Dr. Soetomo General Hospital found that a combination of submandibular space, parapharyngeal, retropharyngeal, and peritonsillar abscesses had as many as 29.01% patients (Alwagdani et al., 2021).

Deep neck abscesses can spread rapidly and cause life-threatening complications such as airway obstruction, carotid artery aneurysm, occlusion of cervical vessels, mediastinitis, osteomyelitis, or sepsis. Parapharyngeal abscesses and retropharyngeal abscesses are the most common. Clinical signs and symptoms can vary depending on the location and depth (Arianto & Romdhoni, 2019).

Appropriate assessment and treatment are crucial to prevent further morbidity or mortality. The most important management is securing the airway. The management followed by hydration, analgesia, antibiotics, and needle aspiration or incision and drainage, as indicated (Castagnini et al., 2015). The aim of this study is to describe a case of multiple deep neck abscesses, the management of the patient and the clinical improvement of the patient.

A 32-year-old male patient presented to the Emergency Department with complaints of a neck swelling and pain in the left side of the throat for approximately 15 days prior to hospital admission. The pain progressively worsened, leading to difficulty swallowing and reduced oral intake. The swelling also gradually increased in size. The patient complained of limited neck motion, difficulty of breathing, sore throat and changes in voice. The patient's voice sounds muffled or "hot potato voice". He also had a previous history of tonsillitis that had not been treated. History of hypertension and diabetes mellitus was denied. On the physical examination, the patient's blood pressure was 121/85 mmHg, heart rate was 76 beats/minute, respiratory rate was 20 times/minute, temperature was 36.5 °C, and oxygen saturation of 96% on room air. Oral examination in figure 1 showed oedema and erythema of left side soft palate, uvula away from the affected side (deviated to the right), tonsillar hypertrophy in both sides (T4/T4), cryptic tonsils, and infiltrate in the left tonsil. The patient's physical examination revealed a swelling and tenderness on the patient's left neck. No signs of respiratory distress were seen.

Figure 1. Findings on Oral Examination

In the complete blood count (CBC), the haemoglobin level was 17.2 (13.5-17.5 g/dL), red blood cell (RBC) count was 5.9 (4.2-5.4 x 10^{12}/mm^3), and white blood cell (WBC) count was elevated at 18.2 (4.4-11.3 x 10^3/µL). Random Blood Sugar was 94 mg/dL. Figure 2 showed a retropharyngeal space and retro-tracheal widening on the patient's soft tissue lateral neck X-ray. Opaque shadows are visible at the level of the C2 paravertebral bilaterally. Chest X-ray revealed no abnormalities. There are no signs of mediastinitis.

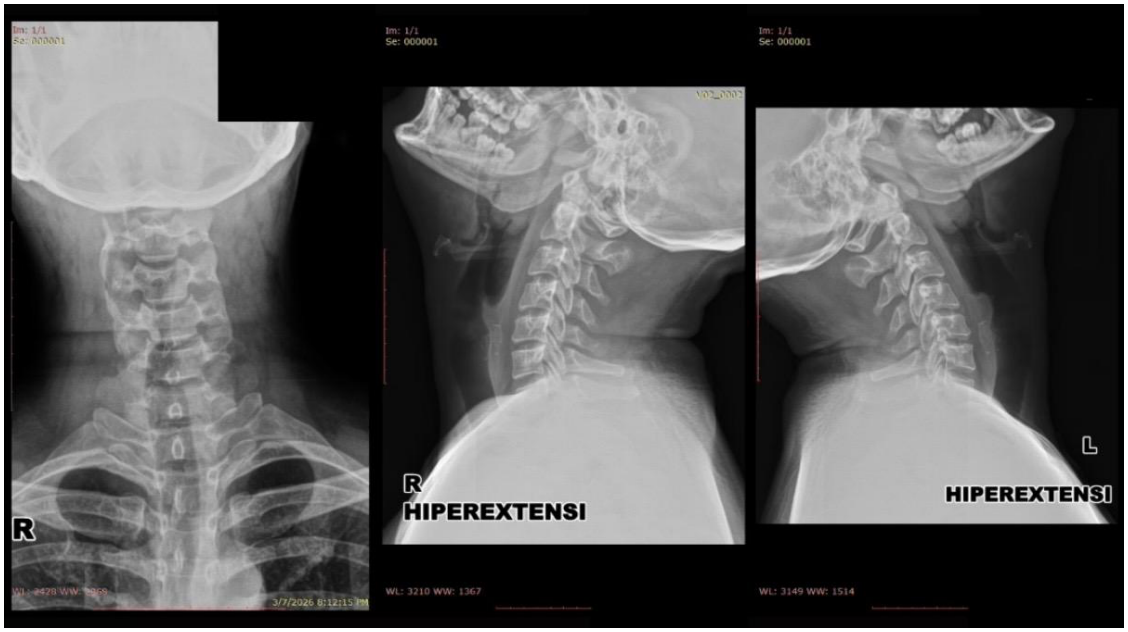

Figure 2. Anteroposterior and Lateral X-Ray of Neck Soft Tissue with Hyperextension Position

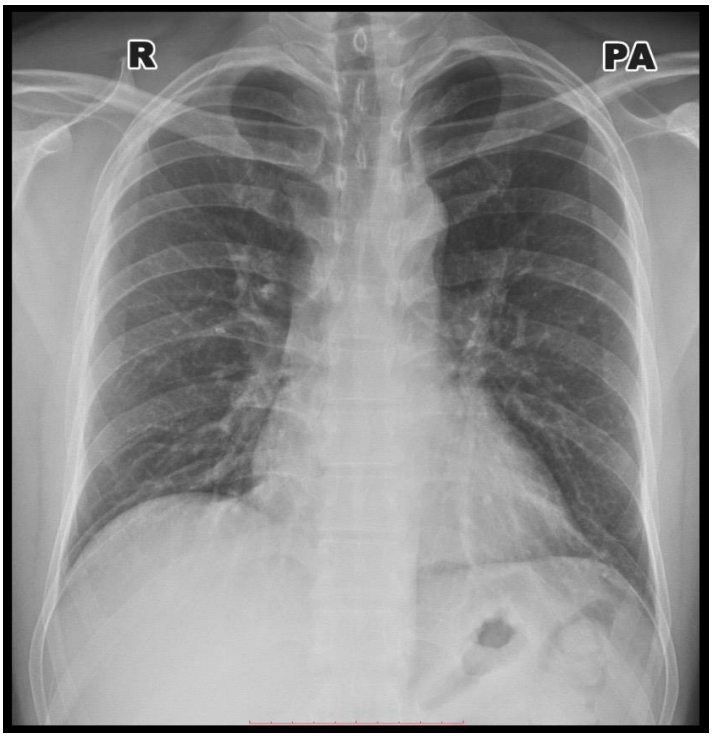

Figure 3. Anteroposterior X-ray of Thorax

Antibiotic treatment was immediately started. Cefotaxime 3x1 gram IV and Metronidazole 3x500 mg IV were given. The patient was also given Dexamethasone injection, Ringer Lactate and Dextrose 5% infusion fluids, pain relievers, and stomach acid reducers. A high-calorie and protein-rich diet were given. During the first 48 hours of combined antibiotics administered, the symptoms and swelling decreased as shown in figure 4. The patient was able to consume a denser diet (porridge). Complete Blood Count was re-examined as an evaluation, a decrease in leukocytes was found to be 15.8 (4.4-11.3 x $10^3/\mu L$).

Figure 4. Patient's Condition After Receiving Antibiotic Injections

On the fifth day of hospitalization, the patient's condition improved. He was able to eat and drink with no difficulty swallowing, had no sore throat, reduced neck swelling, and no shortness of breath. His voice improved and the "hot potato voice" was no longer present. Vital signs of the patient within normal. On physical examination, it was found that the swelling had significantly reduced in the peritonsillar region and neck, the uvula was in the middle, and there were no pus and detritus on the tonsils.

RESEARCH METHOD

This study employed a descriptive qualitative method with a case report approach to provide a comprehensive description of a patient diagnosed with multiple deep neck space infections, including intratonsillar, peritonsillar, and retropharyngeal abscesses.

The subject of this study was a 32-year-old male patient who presented to the Emergency Department with complaints of left-sided throat pain and neck swelling for approximately 15 days prior to hospital admission.

Data Collection Techniques

Data were collected through the following procedures:

Medical history taking (anamnesis)

To obtain information regarding the patient's symptoms, duration of illness, and past medical history.

Physical examination

Including assessment of vital signs, oropharyngeal condition, neck swelling, and respiratory status.

Supporting examinations

1. Laboratory tests: Complete Blood Count (CBC) to identify leukocytosis
2. Radiological examination: Lateral neck X-ray to detect widening of the retropharyngeal space
3. Chest X-ray to rule out mediastinal complications
4. *Clinical observation during hospitalization*

Continuous monitoring of the patient's clinical progress throughout the treatment period.

Research Procedure

After diagnosis, the patient received the following treatments:

1. Intravenous antibiotics (Cefotaxime and Metronidazole)
2. Supportive therapy, including intravenous fluids, corticosteroids, analgesics, and a high-calorie diet

Clinical evaluations were conducted periodically based on:

1. Improvement of symptoms
2. Reduction of swelling
3. Changes in laboratory findings

Data Analysis Technique

Data were analyzed using a descriptive approach, by:

1. Comparing the patient's condition before and after treatment
2. Interpreting clinical and supporting examination findings
3. Relating the results to existing literature on deep neck infections

Purpose of the Method

This method aims to:

1. Describe the diagnostic and management process of the case
2. Evaluate the effectiveness of antibiotic therapy without surgical intervention
3. Provide clinical insights as a reference for similar cases

RESULTS AND DISCUSSION

Tonsillitis is an inflammatory condition of the tonsils, most commonly involving the palatine tonsils, and may result in both local and systemic complications. Local complications occur when the infection spreads beyond the tonsillar tissue to adjacent anatomical structures. One of the most frequent suppurative complications is the accumulation of pus between the tonsillar capsule and the pharyngeal constrictor muscle (Cho et al., 2016). An intratonsillar abscess is defined as the accumulation of purulent material within the tonsillar parenchyma, usually arising from acute follicular tonsillitis (Corbin et al., 2024; Esposito et al., 2022). Peritonsillar abscess, also referred to as quinsy, represents the most common deep neck space infection and predominantly affects adolescents and young adults as a complication of acute tonsillitis or pharyngitis. This condition occurs when purulent material accumulates within the peritonsillar space as a result of infection spreading from the tonsillar tissue or from the minor salivary glands of Weber (Hartedja et al., 2021). From this location, the infection may extend posteriorly through the superior constrictor muscle and buccopharyngeal fascia into the retropharyngeal space, or laterally into the parapharyngeal and carotid spaces (Hendrayani & Nalle, 2025). A retropharyngeal abscess develops when purulent material accumulates within the potential space between the pharyngeal constrictor muscles and the prevertebral fascia.

Progressive enlargement of the abscess may compress the upper airway and result in respiratory distress (Hirvonen et al., 2026; Jain et al., 2024). Figure 5 and 6 illustrate the anatomy of the neck cervical fascia and a sagittal section of the neck. Figure 7 explains the mechanism by which pus spreads to the parapharyngeal and retropharyngeal spaces. The Rijal and Romdhoni study illustrates the pathway that links the underlying causes to the spread of deep neck infections, as shown in Figure 8. In the present patient, the history of untreated tonsillitis likely served as the primary source of infection, which subsequently extended to adjacent deep neck spaces.

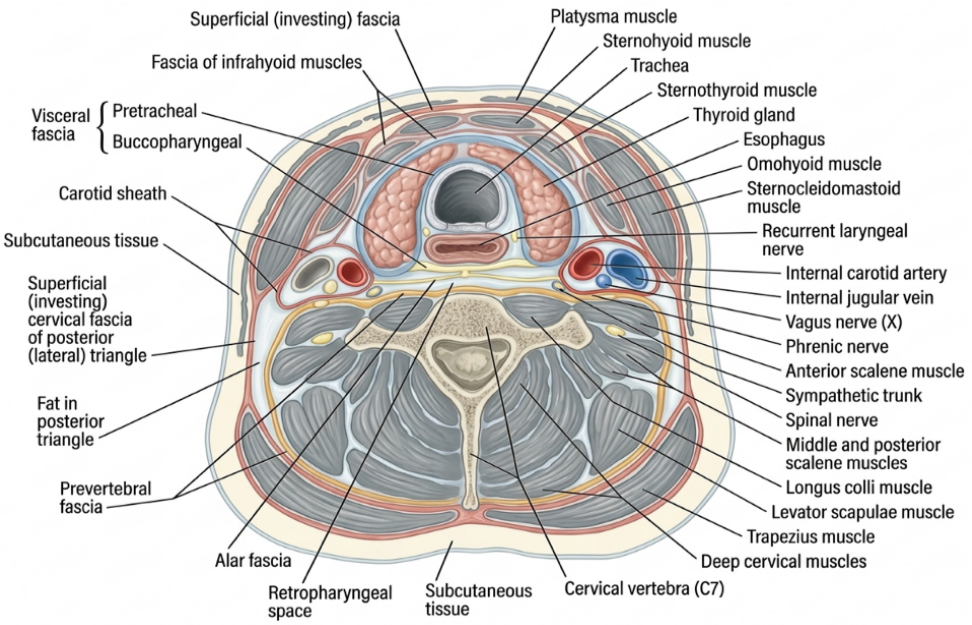

Figure 5. Cervical Fascia

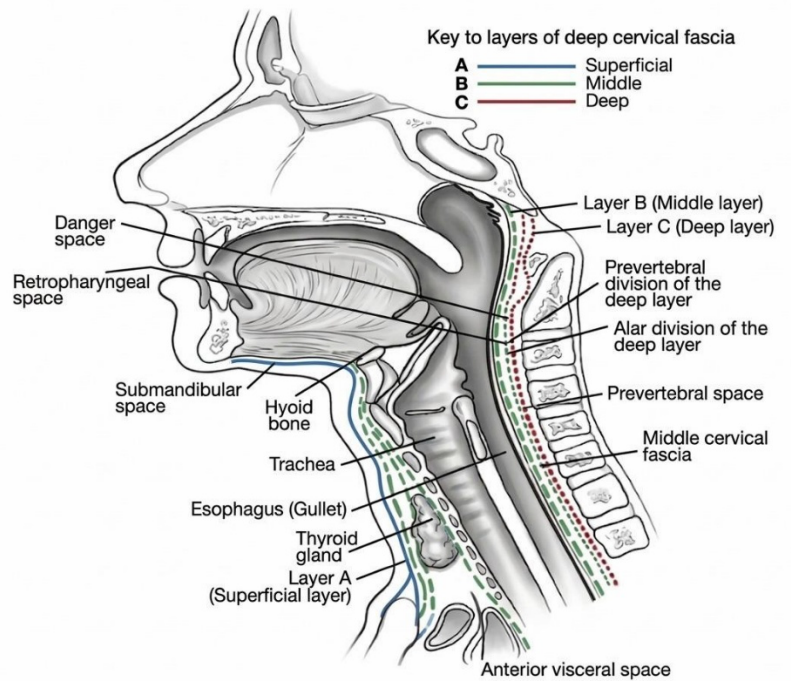

Figure 6. Sagittal Section of Neck

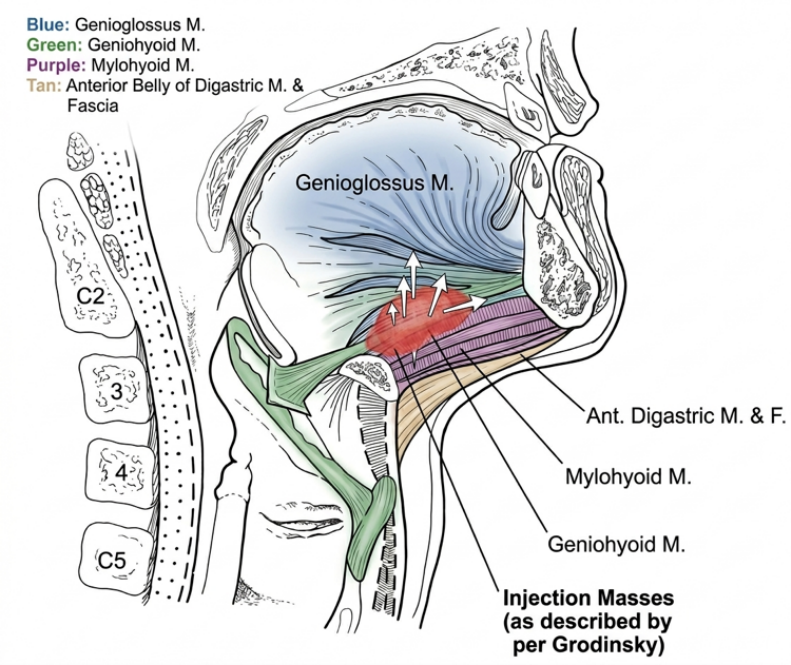

Figure 7. The Mechanism of Pus Extension

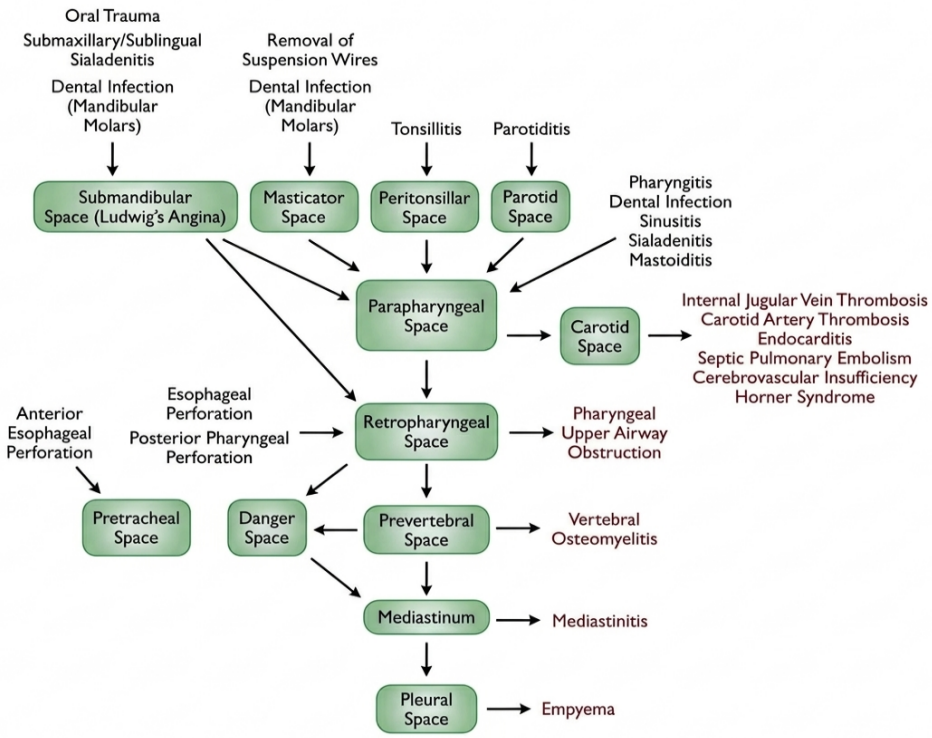

Figure 8. The Spreading Pathway of Deep Neck Infections

In the present case, a 32-year-old male was diagnosed with multiple deep neck abscesses involving the intratonsillar, peritonsillar, and retropharyngeal abscess. Intratonsillar abscesses may be challenging to identify clinically because their manifestations closely resemble those of peritonsillar abscesses. However, two clinical features may help differentiate them are enlargement of the tonsil without prominent peritonsillar swelling and the absence of significant hoarseness. Both findings were observed in this patient. The clinical symptoms experienced by the patient were also consistent with those commonly reported in peritonsillar abscess,

including unilateral throat pain, dysphagia, uvula deviation, cervical lymphadenopathy, and a characteristic muffled “hot potato voice”. Patients with retropharyngeal abscess may additionally present with low-grade fever, odynophagia, decreased oral intake, neck stiffness, altered voice quality, respiratory distress, and cervical swelling. These symptoms highlight the importance of careful clinical evaluation in patients with suspected deep neck infections.

Laboratory evaluation plays a supportive role in the assessment of suspected deep neck infections. Leukocytosis is frequently present due to the underlying infectious process. Previous studies have reported that white blood cell counts frequently exceed 12,000/µL in patients with retropharyngeal abscess. In this patient, the leukocyte count was elevated to 18,200/µL, supporting the presence of an active infectious process.

Radiographic examination of the cervical soft tissues is a practical and accessible method for assessing the retropharyngeal and prevertebral spaces. Lateral neck radiography allows measurement of the distance between the anterior part of the vertebra and the posterior wall of the pharynx (Kim et al., 2011). In cases of retropharyngeal infection, this imaging modality may demonstrate widening of the prevertebral soft tissue space. In healthy adults, the prevertebral soft tissue thickness should not exceed 7 mm at the C2 level and 22 mm at the C6 level (with a lower limit of 14 mm in children). Widening beyond these values may indicate abscess. The sensitivity and specificity of lateral neck radiographs in detecting retropharyngeal abscess have been reported to be approximately 80% and 100%, respectively. Computed tomography (CT) scanning demonstrates a sensitivity of nearly 100% but a lower specificity for diagnosing retropharyngeal abscess (Krishnaprasadh et al., 2026). In the present case, CT imaging was not performed because of limited facility availability. Despite the absence of CT imaging, the combination of clinical findings and lateral neck radiography provided sufficient information to support the diagnosis and guide management. Additionally, chest radiography should be performed to evaluate for possible mediastinal extension of the infection in patients who present chest symptoms.

Deep neck abscesses are typically polymicrobial infections involving aerobic, anaerobic, and facultative anaerobic bacteria. Tsai et al. reported that aerobic organisms were identified in 85.7% of pus cultures obtained from 168 patients, while anaerobic or facultative anaerobic bacteria were detected in 44.0%, and mixed infections were present in 29.8% of cases (Loperfido et al., 2023). Table 1 illustrates the bacterial culture findings in deep neck abscess from selected studies, with Klebsiella pneumoniae showing the highest proportion at 20%, followed by Staphylococcus aureus (14,2%), Streptococcus anginosus (10,3%), and Streptococcus viridans (10,3%) (Mohamed et al., 2025; Nimmana & Paterek, 2025; Prasetyo & Surjotomo, 2024).

Table 1. Bacterial Culture Findings in Deep Neck Abscess from Selected Studies[3,17,18,19]

Bacterial Species	Rijal & Romdhoni, 2018 (n=86)	Arianto & Romdhoni, 2019 (n=21)	Hartedja et al., 2021 (n=9)	Prasetyo & Surjotomo, 2024 (n=39)	Total cases (n=155)	Percentage (%)
Klebsiella pneumoniae	18	2	1	10	31	20,0
Staphylococcus aureus	12	7	1	2	22	14,2
Streptococcus anginosus	15	1	-	-	16	10,3
Streptococcus viridians	4	6	2	4	16	10,3
Streptococcus constellatus	9	-	-	-	9	5,8
Acinobacter baumanii	7	-	-	1	8	5,2
Streptococcus pyogenes	3	-	2	2	7	4,5
Streptococcus β-haemolyticus	-	-	-	6	6	3,9
Streptococcus acidominumus	3	1	-	-	4	2,6
Staphylococcus hominis	3	1	-	-	4	2,6
Streptococcus agalactiae	3	-	1	-	4	2,6
Staphylococcus coagulase negative	-	-	-	4	4	2,6
Staphylococcus haemolyticus	3	-	-	-	3	1,9
Staphylococcus epidermidis	2	-	1	-	3	1,9
Streptococcus oralis	2	1	-	-	3	1,9
Streptococcus uberis	2	1	-	-	3	1,9
Streptococcus α-haemolyticus	-	-	-	3	3	1,9
Pseudomonas aeruginosa	-	-	1	1	2	1,3
Escherichia coli	-	-	-	2	2	1,3
Streptococcus mitis	-	-	-	1	1	0,6
Streptococcus non haemolyticus	-	1	-	-	1	0,6
Burkholderia cepacia	-	-	-	1	1	0,6
Proteus mirabilis	-	-	-	1	1	0,6
Providecia stuartii	-	-	-	1	1	0,6

In this case, a combination of intravenous cefotaxime and metronidazole was initiated to provide coverage against both aerobic and anaerobic bacteria. Previous studies have demonstrated that combinations of penicillin or cephalosporins with metronidazole are highly effective in treating deep neck infections. Repanos et al. reporting effectiveness in 99.2% of specimens. Empirical broad-spectrum antibiotic therapy targeting mixed bacterial flora is therefore considered an appropriate initial treatment strategy. Table 2 presents the antibiotic sensitivity patterns of bacteria isolated across the selected studies, with the highest sensitivity

shown by Meropenem (76,81%), followed by Chloramphenicol (66,67%), and Oxacillin (66,67%).

Table 2. Antibiotic Sensitivity Patterns of Bacteria Isolated Across Selected Studies[3,17]

Antibiotic	Rijal & Romdhoni, 2018			Arianto & Romdhoni, 2019			Σ	Total					
	S (n)	I (n)	R (n)	S (n)	I (n)	R (n)		S (n)	S (%)	I (n)	I (%)	R (n)	R (%)
Meropenem	39	2	12	14	0	2	69	53	76,81	2	2,90	14	20,29
Chloramphenicol	51	3	20	9	3	4	90	60	66,67	6	6,67	24	26,67
Oxacillin	24	0	12	-	-	-	36	24	66,67	0	0,00	12	33,33
Imipenem	13	3	4	-	-	-	20	13	65,00	3	15,00	4	20,00
Cefixime	-	-	-	9	1	4	14	9	64,29	1	7,14	4	28,57
Levofloxacin	41	3	21	-	-	-	65	41	63,08	3	4,62	21	32,31
Moxifloxacin	13	3	4	7	2	3	32	20	62,50	5	15,63	7	21,88
Cefoperazone-sulbactam	19	3	10	7	1	2	42	26	61,90	4	9,52	12	28,57
Cefotaxime	25	5	13	11	3	2	59	36	61,02	8	13,56	15	25,42
Piperacillin tazobactam	12	2	6	-	-	-	20	12	60,00	2	10,00	6	30,00
Ceftriaxone	19	5	13	14	1	4	56	33	58,93	6	10,71	17	30,36
Ceftazidime	23	6	11	11	4	3	58	34	58,62	10	17,24	14	24,14
Fosfomycin	34	9	16	-	-	-	59	34	57,63	9	15,25	16	27,12
Erythromycin	37	3	24	9	1	6	80	46	57,50	4	5,00	30	37,50
Ciprofloxacin	22	3	14	10	0	7	56	32	57,14	3	5,36	21	37,50
Cefoperazone	-	-	-	8	2	4	14	8	57,14	2	14,29	4	28,57
Cotrimoxazole	47	9	27	7	3	2	95	54	56,84	12	12,63	29	30,53
Amikacin	22	1	16	-	-	-	39	22	56,41	1	2,56	16	41,03
Tetracycline	16	9	14	-	-	-	39	16	41,03	9	23,08	14	35,90
Penicillin G	22	1	31	-	-	-	54	22	40,74	1	1,85	31	57,41
Ampicillin-sulbactam	28	9	32	6	5	5	85	34	40,00	14	16,47	37	43,53
Gentamycin	33	9	46	7	1	5	101	40	39,60	10	9,90	51	50,50
Ampicillin	22	10	38	8	3	6	87	30	34,48	13	14,94	44	50,57

Notes : S = Sensitive; I = Intermediate; R = Resistant

Surgical incision and drainage are generally indicated in patients with large abscesses, airway compromise, complications, or lack of clinical improvement after approximately three days of medical therapy (Reyes et al., 2011; Rijal & Romdhoni, 2018).

However, several studies have shown that conservative management may be effective in selected cases. Al Riyami reported that although most patients required incision and drainage, a smaller proportion were successfully treated with intravenous antibiotics alone (Singh et al., 2015). Similarly, Khudan et al. suggested that conservative treatment may be initiated for retropharyngeal abscesses larger than 2 cm during the first 48 hours, provided that the patient demonstrates clinical improvement (Tsai et al., 2018).

This case highlights the importance of early recognition and prompt management of deep neck infections to prevent potentially life-threatening complications such as airway obstruction, mediastinitis, and sepsis. Clinicians should maintain a suspicion in patients presenting with progressive throat pain, neck swelling, dysphagia, and a muffled “hot potato voice”, particularly in those with a history of untreated tonsillitis (Khudan et al., 2016). Careful clinical evaluation supported by appropriate imaging plays a crucial role in establishing an accurate diagnosis and identifying the extent of infection. Although surgical drainage is often considered the standard treatment for deep neck abscesses, this case demonstrates that selected patients may respond well to early and appropriate board-spectrum intravenous antibiotic therapy with close clinical monitoring, potentially avoiding the need for invasive procedures while still achieving optimal clinical outcomes.

CONCLUSION

This case highlights the importance of assessment, accurate diagnosis, and appropriate management in patients with multiple deep neck abscesses to prevent serious complications and mortality. In this patient, conservative treatment with a combination of cefotaxime and metronidazole injections was highly effective, leading to clinical improvement without the need for surgical intervention such as needle aspiration or incision and drainage. Management decisions, including intravenous antibiotic therapy or in combination with surgical intervention, should be individualized based on the patient’s clinical condition, with consideration of potential complications and overall prognosis.

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