Section: General Surgery

Case Series

PYOMYOSITIS NECK AS A DIAGNOSTIC CHALLENGE IN TROPICS - A CASE SERIES

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Abstract

Background: Pyomyositis is an uncommon infection of skeletal muscle that may be primary or secondary. Primary type has bacterial etiology, and Staphylococcus Aureus is associated in most cases. Diagnosis requires high index of suspicion and careful assessment of radiological investigations. Evacuation of pus coupled with appropriate antibiotic therapy is the mainstay and curative in most cases. We describe our experience with this condition in a series of seven cases with diverse involvement of sternocleidomastoid muscle. All cases had primary pyomyositis .All cases were managed by open surgical drainage. The outcome was good in all cases with no recurrence or complications noted in their respective follow up. **Materials and Methods:** Anobservational study was conducted in the Department of Surgery, NRI Medical College and Hospital including 7 patients withneck abscess. **Result:** Different muscle groups have been documented with this entity. The sternocleidomastoid muscle, however, caught our attention as a peculiar location, particularly in 2 cases with sternocleidomastoid and subclavius muscle also 5 of Our case series with diabetes mellitus as common risk factor and 2 cases with no specific cause detected. **Conclusion:** Generally speaking, encountering cases of spontaneous abscesses is common in the context of individuals with notablerisk factor. However, Pyomyositis is not uncommon in those with impaired immune systems, as in these cases, in which blood glucose levels were not optimal. It may also present in person without any notable risk factors like the first case in this case series.

INTRODUCTION

The etiologies of neck abscess includes-themost common organism implicated is Staphylococcus aureus. In 20%–50% of cases there is a history of trauma to the affected muscles. Group A streptococcus accounts for another 1%–5% of cases and other organisms uncommonly implicated are streptococcus(groups B, C, G), pneumococcus, neisseria, haemophilus, aeromonas, serratia, yersinia, pseudomonas, klebsiella, and escherichia.[1-9] Rarely salmonella, citrobacter, fusobacterium, anaerobes, and mycobacterium are seen.[10-14]

In tropical regions, pus cultures are sterile in Commonly involved muscles are quadriceps, glutei, pectoralis major, serratus anterior, biceps, iliopsoas, gastrocnemius, abdominal and spinal muscles. Early diagnosis is often missed because of lack of specific signs, unfamiliarity with the disease, atypical manifestations, and a wide range of differential diagnosis.

Diagnostic techniques like ultrasound and computed tomography/magnetic resonance imaging are very useful in diagnosis. The diagnosis is confirmed either by biopsy or aspiration of pus from the affected muscles.

Diagnostic investigations are crucial for early detection. Contrast enhanced Computed tomography (CECT) has high sensitivity (up to 96%) and specificity (around 94%) for identifying vascular occlusions. The prognosisis poor without timely intervention; mortality rates can reach 50-90% due to sepsis if treatment is delayed. This study evaluates patients with neck abscess presenting to the Department of Surgery for the risk factors, etiology, presentation, sonological evidence, prognosis and treatment outcomes.

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Illustrating early diagnosis and treatment can prevent the development of severe complications with less morbidity in neck abscess.

Objectives Includes

1. To describe various presentations and outcomes of patients diagnosed with Pyomyositis of Sternocleidomastoid
2. To analyze demographic characteristics, predisposing factors among the cases included
3. To reduce morbidity and enhanced recovery

MATERIALS AND METHODS

An observational case series was done in the Department of General Surgery, NRI Medical College &General Hospital, to evaluate clinical outcomes, diagnostic modalities, and management strategies in patients diagnosed with neck abscess.

Neck abscesses over a 2-year period, from January 2023 to August 2024, at a tertiary care center were noted. Ethical approval was obtained from the hospital's Institutional Review Board (IRB) prior to data collection.

The study included observation of 7 patients diagnosed with neck abscesses based on clinical suspicion and confirmed via imaging or intraoperative findings. Inclusion criteria consisted of adult patients with unilateral and bilateral neck abscesses confirmed by primary ultrasonography and computed tomography neck and upper chest.

Diagnostic modalities, particularly imaging findings from CT scans, were reviewed. Details on causative organisms and management and intraoperative findings were documented.Descriptive statistics were used for demographic and clinical variables. Statistical significance was set at $p < 0.05$.

RESULTS

CASE 1

73yearold male came with c/o swelling in left side of neck, sudden in onset, gradually progressive in size, associated with fever O/E: swelling of size approximately 10 x 6 cm present on left side of neck, extending medially uptomidline, laterally upto posterior border of sternocleidomastoid, superiorly upto Thyroid notch, Inferiorly upto sternum, induration present ,Erythema present, mild local rise of temperature,1x1cm necrotic patch present over the swelling 2 x 2cm palpable lymphnode of size palpable in left Axilla, firm and mobile CECT Neck : Bulky left sternocleidomastoid with ill defined lobulated hypodense collection extending into it, parotid space anteriorly, forming a subcutaneous collection in it. Lateral aspect of neck with adjacent inflammatory changes Ill-defined collection in subcutaneous planes of left anterior chest wall, indenting anteromedial aspect of left pectoralis major muscle : Pyomyositis.

Incision and drainage was done: 70 -80ml pus drained cavity noted within left sternocleidomastoid extending unto anterior chest wall and seton was placed Pus sent for culture positive for Enterococcus Faecalis sensitive to Imipenem, Linezolid, Tigecycline Cephalosporins, were given intravenously for 1 week and started on oral antibiotics. There was marked clinical improvement coupled with normal counts in second month, and no recurrence of the condition was noted in the follow up of six months.

CASE 2: A 52 year old female presented with c/o swelling in left side of neck, insidious onset, gradually progressive associated with fever, chills and pain O/E: Swelling of size 10x6cm present in next extending superiorly upto left side Mandible, inferiorly upto left supraclavicular region Medially crossing the midline, laterally extending into posterior aspect of neck, local rise of temperature present, firm in consistency

CECT Neck: Large, non enhancing collection in the left side of neck with Infiltration into adjacent structures is most likely Pyomyositis with Reactive Lymphadenopathy

Incision and drainage was done: 300ml purulent pus drained, left sternocleidomastoid sloughed upto mastoid extending upto left clavicle Pus sent for culture positive for klebsiella pneumoniae sensitive to cephalosporins, Meropenem, Netilmicin, Tobramycin Cephalosporins, carbepenems were given intravenously for 1 week and started on oral antibiotics, there was clinical improvement within 1 month

CASE 3

A 41 year old male with c/o swelling in both sides of neck, insidious onset, progressive in nature, associated with pain O/E: 10x4cm swelling present on right side of neck extending from suprasternal notch, 3-4cm extending on either side of sternum, skin over the swelling is normal, firm in consistency

CECT Neck: Bilateral sternocleidomastoid muscles appear bulky and shows peripheral enhancement with multiple air foci all along the course from origin to insertion with lateral extension into left subclavius muscle: Bilateral Pyomyositis

Incision and drainage was done: 10cc purulent pus drained from cavity deep to left supraclavicular region, slough present over bilateral sternocleidomastoids Pus sent for culture positive for klebsiella pneumoniae sensitive to cephalosporins, Meropenem, Netilmicin, Tobramycin Cephalosporins, carbepenems were given intravenously for 1 week and started on oral antibiotics, secondary suturing was done after 20 days there was clinical improvement within 2months.

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CASE 4

A 43 year old female with c/o swelling over right side of neck, insidious in onset, gradually progressive in nature, associated with pain O/E: Swelling of size 10x8 cm present along the Right Sternocleidomastoid extending from cricoid till supraclavicular area medially till midline, laterally till lateral border of sternocleidomastoid, no local rise of temperature, erythema present, induration present, firm in consistency

CECT Neck: Ill defined heterogeneously hypodense peripherally enhancing lesion with adjacent fat stranding in infrahyoid compartment towards right infiltrating sternocleidomastoid - suggestive of Pyomyositis

Incision and drainage was done 15cc pus was drained from loculated pockets around sternocleidomastoid and infraclavicular area, slough present Pus sent for culture. Initially it was burkholderia cepaciae later it was AFB positive Patient was kept on Antibiotics and regular dressings were being done.

CASE 5

A 56 year old male presented with c/o swelling in left side of neck, insidious onset, gradually progressive associated with fever, chills and pain O/E: Swelling of size 10x6cm present in next extending superiorly upto left side Mandible, inferiorly upto left supraclavicular region Medially crossing the midline, laterally extending into posterior aspect of neck, local rise of temperature present, firm in consistency

CECT Neck: Large, non enhancing collection in the left side of neck with Infiltration into adjacent structures is most likely Pyomyositis with Reactive Lymphadenopathy

Incision and drainage was done: 30ml purulent pus drained, left sternocleidomastoid sloughed upto mastoid extending upto left clavicle

Pus sent for culture positive for klebsiella pneumoniae sensitive to cephalosporins, Meropenem, Tobramycin Cephalosporins, carbepenems were given intravenously for 1 week and started on oral antibiotics, there was clinical improvement within 1 month.

CASE 6

A 45-year-old male, diabetic, presented with a one week history of progressive bilateral neck swelling with limited range of motion. Preceeding the neckswelling, he reported a week of cough, fever up to 104°F, odynophagia, nausea/vomiting, and dysphagia. The patient also complained of shortness of breath and right shoulder/upper chest pain. He had a past medical history of well-controlled, insulin-dependent type II diabetes mellitus and coronary artery disease. He was a former 50 pack per year tobacco user who quit 20 years prior.

Upon examination the right neck and sternoclavicular areas were erythematous, indurated, fluctuant, and tender. The right pectoral region was erythematous, indurated, and with deep fluctuance to palpation. There were no palpable left neck masses, however, the left neck was notably tender to palpation without overlying skin changes.

Initial laboratory workup revealed a leukocyte count of 37,000/mcL (normal value 3400-10,400/mcL) and blood glucose levels ranging between 153 and 199 mg/dL (normal value 60-100 mg/dL). The patient's mostrecent haemoglobin A1c (HbA1c) level was 6.8% (normal value <5.7%). Computed tomography (CT) imaging revealed a 7.4 cm peripherally enhancing right sternocleidomastoid (SCM) abscess, a 10.5 cm right pectoralis major muscles abscess, and a 9.2 cm hypodense fluid collection found in the anterior mediastinum and retrosternal space.

Subsequently, the patient underwent exploration with incision and drainage (I&D) of the right neck abscess, right anterior neck, and right pectoralis major muscle. Twenty ml of thick, purulent fluid were expressed from the right sternocleidomastoid (SCM) abscess. The abscess cavity extended superiorly to the level of the mandible, the midline, and inferiorly to the sternal notch.

To cover deep neck space infection, he was first empirically treated with vancomycin, piperacillin tazobactam, and clindamycin. Blood and tissue cultures revealed Bacteroides fragilis. Antibiotics were adjusted based upon susceptibilities to cefepime and metronidazole.

CASE 7

A 48-year-old male presented with a one-week history of sore throat associated with two-day history of left neckpain and swelling. He had no dysphonia, dysphagia, odynophagia, otalgia or dental pain. He was a lifelong non-smoker with no occupational risk factors, consuming approximately 30 units of alcohol per week. There was no history of recent trauma, foreign travel oranimal contact. On admission, he

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was febrile (39.3◦C) and tachycardic (120beats/min). Examination revealed erythema extending from infra-auricular region to the clavicle with warm and tender unilateral neck swelling and reduced lateral rotation. No associated palpable cervical lymphadenopathy and no trismus but chronic decay to the left lower posterior molars with no associated submandibular or floor of mouth swelling. Laboratory investigations showed Haemoglobin 12.9 g/dl, white blood cells 18.5 × 109/l (neutrophils 15.5 × 109/l, lymphocytes0.7 × 109/l) and C-reactive protein 294 mg/l. A random blood glucose level was within normal range and a HIV test negative. To cover for a deep neck space infection he was empirically treated with intravenous co-amoxiclav and clindamycin. CT imaging confirmed a large heterogeneous mass with dimensions5.3 × 4 × 10 cm extending throughout the left sternocleidomastoid muscle. Multiple adjacent enlarged cervical lymph nodes (levels II, III, V and left supraclavicular) were noted. There were no collections seen in the retropharyngeal space or superior mediastinum and the vessels in the carotid space appeared patent. The patient underwent exploration and drainage of a leftinfra-sternocleidomastoid neck abscess. Intra-operatively approximately 60 ml of thick pus was identified within the sternocleidomastoid muscle with three pockets extending superiorly towards mastoid tip, inferiorly towards the clavicle and posteriorly towards the posterior triangle. Specimens were sent for both histology and microbiology, with corrugated drains inserted into the identified pockets. Histology confirmed a specimen of muscle showing abscess formation. No acid-fast bacilli were seen, no bacteria were identified on gram stain and no fungi grown. Microbiology from both the pus and swab confirmed staphylococcus sensitive topenicillin and clindamycin with resistance to tetracycline. The co-amoxiclav (1.2 grams every 8 hours) was changed to intravenous benzyl-penicillin (1.2 grams every 6 hours) for 4 days before conversion to single agent oral clindamycin (450 mg every 6 hours). Prior to discharge, blood results had improved with C-reactive protein falling to 27 mg/l and white blood cells to 6.3 × 09/l(neutrophils 4.2 × 109/l). In clinic, approximately 3 weeks after discharge, the patient remained well and had returned to normal everyday activity. He completed four-weeks of oral clindamycin and on subsequent review had no evidence of residual infection.

Table 1: Presentation of case series.

Age/ Sex	Comorbidities	Muscle group involved	Microbiology	Antibiotic Treatment	Wound Closure	Complications
73Y/M	NO	Sternociedomastoid, Pectoralis Major	Enterococcus	Cephalosporins, Beta lactamase Inhibitors	Secondary Healing	Nil
52Y/M	Diabetic	Sternociedomastoid	Klebsiella Pneumonia	Cephalosporins	Secondary Healing	Nil
41/M	Diabetic	Sternociedomastoid, Subclavius	Klebsiella Pneumonia	Cephalosporins Carbapenems	Tertiary Healing	Nil
43Y/F	Diabetic	Sternociedomastoid,	Acid Fast Bacilli, Burkholderia Cepaciae	Carbapenems	Secondary Healing	Nil
56Y/M	Diabetic, asthmatic	Sternocleidomastoid	Klebsiella pneumonia	Carbapenems	Secondary healing	Nil
45Y/M	Diabetic, CAD	Bilateral sternocleidomastoids	Bacteroides fragilis	Cephalosporins, carbapenems Amoxicillins	Secondary healing	Nil
48Y/M	None	Sternocleidomastoid, Subclavius	Staphylococcus aureus	Cephalosporins	Teritary healing	nil

DISCUSSION

Bacterial pyomyositis is an acute pyogenic infection that results in the formation of single or multiple abscesses in skeletal muscle. It normally affects large muscle group and extremities, such as the quadriceps.[1-3] Presentation of pyomyositis in neck muscles is rare. In the last 20 years, only a few cases have been reported.[1-4] Staphylococcus aureus was cultured from pus aspirates of 90% of tropical pyomyositis infections and 75% of non-tropical pyomyositis infections.[2,4] Other common causative pathogens are Streptococcus pyogenes, other beta-haemolytic Streptococci, Streptococcus pneumoniae, Streptococcus viridans, Escherichia coli, and Mycobacterium tuberculosis.[2,3]

Pyomyositis accounts for 1–2 percent of surgical admissions in some tropical areas and is described as an abscess within skeletal muscles. It typically affects the extremities, most commonly the quadriceps, however some report several abscesses across multiple sites; the trunk, shoulder girdle and thigh muscles

According to Bickel et al,[1] in 2002, involvement of neck muscles is rare. It can affect at any age /young males most susceptible, maximum incidence is 10 to 40 years of age, male: female [1.5:1] Etiology is not sure, more common in immunocompromised patients, such as those with diabetes mellitus, HIV, acquired immunodeficiency syndrome, and autoimmune disease.

In this case series 5 cases were in immunocompromised state with diabetics with uncontrolled sugars.

Although an unusual infection, diagnosis of pyomyositis can be classified using a four-tiered

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system based upon the major tissue planes involved as proposed by Klabacha et al in 1982.[6]

Lopez-Rodriguez et al., 2008.[15] No recent physical effort/trauma to SCM and Pec major involvement. S. aureus was isolated organism. Given Cloxacillin 1 g QDS IV for 10 days PO for 8 weeks. No complications on follow up reported. No concerns at 5 month follow-up Soleh et al, 2010.[16] Poorly controlled type II diabetes mellitus Klebsiella pneumonia Co-amoxiclav and Metronidazole (dose not specified) Not specified Incision and drainage Nil reported No outcome reported.

Type one infections have limited involvement within the epidermis and subcutaneous lymphatic system, for example, erysipelas. Type two involves the subcutaneous tissue with thrombosis of dermal lymphatics. Type three is infections along the fascial planes. Type four involves deeper tissue with myonecrosis that need early recognition and aggressive treatment according to literature.

In this case series we found different organisms in each case like Klebsiella Pneumonia, Enterococcus Faecalis, Acid Fast Bacilli, Burkholderia Cepaciae Clinically, the disease has three consecutive stages. Stage one includes diffuse muscle infection characterised by cramping, progressive pain and low-grade pyrexia. Suppurative stage two or abscess formation is associated with high fevers, restricted muscle movement and oedema of the overlying skin. Stage three involves systemic manifestations including high fever, severe pain and sepsis.

Pyomyositis is another rare complication of DM and makes timely diagnosis challenging. Initial stage includes local symptoms and fever, when left untreated, it can progress into abscess formation with worsening symptoms. Delay in the diagnosis and management can result in severe sepsis with organ failure and shock at a late stage.

Appropriate and prompt use of imaging is essential in the evaluation of patients with local pain and swelling, associated with infection. Muscle biopsy may be considered for inconclusive cases.

We have diagnosed with the help of imaging like CECT Neck and immediate incision and drainage was done with seton placement for irrigation, dressings and to maintain the different communicating tracts within different fascial planes. This case series showed proper diagnosis, early surgical intervention, coupled with sensitive Antibiotics, showed a tremendous recovery and improvement in follow up in all the cases without any further complications.

CONCLUSION

Generally speaking, encountering cases of spontaneous abscesses is common in the context of individuals with notablerisk factor. However, Pyomyositis is not uncommon in those with impaired immune systems, as in these cases, in which blood glucose levels were not optimal. It may also present in person without any notable risk factors just like the first case in this case series.

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REFERENCES

1. Bickels J, Ben-Sira L, Kessler A, Wientroub S: Primary pyomyositis. J Bone Joint Surg Am. 2002, 84:2277-86.10.2106/00004623-200212000-00024
2. Chiedozi LC: Pyomyositis. Review of 205 cases in 112 patients . Am J Surg. 1979, 137:255-9. 10.1016/0002-9610(79)90158-2
3. Stevens DL, Bisno AL, Chambers HF, et al.: Practice guidelines for the diagnosis and management of skinand soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis. 2014,59:147-59. 10.1093/cid/ciu296
4. Wexler HM: Bacteroides: the good, the bad, and the nitty-gritty . Clin Microbiol Rev. 2007, 20:593-621.10.1128/CMR.00008-07
5. Fraser C, Thompson CS, Yeo JCL. Isolated left sternocleidomastoid pyomyositis: a rare presentation of cervical sepsis. BMJ Case Report 2024 Feb 14;17(2):e257426. doi: 10.1136/bcr-2023-257426. PMID: 38355210; PMCID: PMC10868239.
6. Klabacha ME, Stankiewicz J, Clift SE. Severe soft tissue infections of the face and neck: a classification. Laryngoscope 1982;92:1135–9.
7. S. Collier, N. Vig, J. Collier,Two cases of tropical pyomyositis of the sternocleidomastoid muscle occurring in the UK,British Journal of Oral and Maxillofacial Surgery
8. Christin L, Sarosi GA. Pyomyositis in North America: case reports and review.Clin Infect Dis 1992;15:668–77.
9. Sarubbi FA, Gafford GD, Bishop DR. Gram negative bacterial pyomyositis:unique case and review. Rev Infect Dis 1989;11:789–92.
10. Mootsikapun P, Mahakkanukrauh A, Suwannaroj S, et al. Tuberculous pyomyositis. J Med Assoc Thai 2003;86:477–81.
11. Minami K, Sakiyama M, Suzuki H, et al. Pyomyositis of the vastus medialis muscle associated with Salmonella enteritidis in a child. Pediatr Radiol. 2003;33:492–4.
12. Brook I. Pyomyositis in children, caused by anaerobic bacteria. J Pediatr Surg 1996;31:394–6.
13. Wolf RF, Konings JG, Prins TR, et al. Fusobacterium pyomyositis of the shoulder after tonsillitis. Report of a case of Lemierre's syndrome. Acta Orthop Scand 1991;62:595–6.
14. Fincher RM, Jackson MW, Fischer AQ. Citrobacter freundii: a newly reported cause of pyomyositis. Am J Med Sci 1990;299:331–3.
15. López-Rodríguez R, Campos-Franco J, Mallo-González N, Alende-Sixto MR,González-Quintela A. Sternocleidomastoid and pectoralis major pyomyositisin an immunocompetent patient. Orthopedics 2008;31:1146.
16. Soleh MN, Irfan M. Sternocleidomastoid pyomyositis mimicking parotidabscess. Bangladesh J Med Sci 2010;9:238–40.

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