ISSN: 0975-3583, 0976-2833 VOL 15, ISSUE 08, 2024

Paediatric Submandibular Abscess: An Unexpected Diagnosis of Cat-Scratch Disease

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Received: 28-05-2024 / Revised: 07-06-2024 / Accepted: 15-07-2024

ABSTRACT
Cat-scratch disease (CSD) is an infectious condition predominantly affecting children, presenting as lymphadenopathy, fever and headache, as well as atypical manifestations including oculo-glandular syndrome, meningoencephalitis, osteolytic lesions, and retinitis [1]. Usually caused by a cat's scratch or bite, it is the primary cause of infectious lymphadenitis among children, adolescents, and young adults [2]. We report a case of a 16-year-old boy with a growing left-sided neck mass, initially misdiagnosed and treated for lymphadenitis at a local hospital. The mass did not resolve and became fluctuant, diagnosed as cat-scratch disease at our institution [3].

INTRODUCTION
Cat-scratch disease (CSD), caused by Bartonella henselae, often presents as febrile lymphadenopathy in children exposed to infected cats [4,5]. Head and neck manifestations typically present as cervical swelling. Although usually self-limiting and not requiring antibiotics, abscess formation and other complications are rare [3]. Due to its various clinical presentations, CSD can be mistaken for other conditions [1,5]. This case report discusses a case of CSD in a 16-year-old boy.

CASE REPORT
A 16-year-old boy presented with a four-week history of a progressively enlarging left submandibular mass. Initially evaluated at a local hospital and treated with amoxicillin with clavulanic acid, the condition showed no improvement after two rounds of antibiotics. The swelling became fluctuant, leading to referral to our institution. Upon admission, the patient had a fever (100.1°F) and a pulse rate of 89 beats per minute. He reported exposure to cats one week prior to symptom onset and had a scratch mark on his left hand [1,3].

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Image 1: Scratch mark on his hand

He does not have any known comorbidities. Examination revealed a firm, tender, indurated mass measuring 4x3 cm in the left submandibular space with fluctuance. No scratches, bites, or cuts were visible in the head and neck area. oral cavity examination indicated the absence of dental caries and tooth infections and there were no signs of gum disease or abnormal oral lesions.

Image 2: Left submandibular swelling

CLINICAL DIAGNOSIS

Cat Scratch Disease

DIFFERENTIAL DIAGNOSIS

Tuberculosis, toxoplasmosis, cat scratch disease, sarcoidosis, actinomycosis, sialadenitis, tumours involving submandibular gland,

The patient was admitted and began receiving intravenous antibiotics. Ultrasound revealed an enlarged submandibular gland with a heterogeneous hypoechoic abscess (2x1.1x2.1 cm, 4 ml volume) and reactive cervical lymph nodes.

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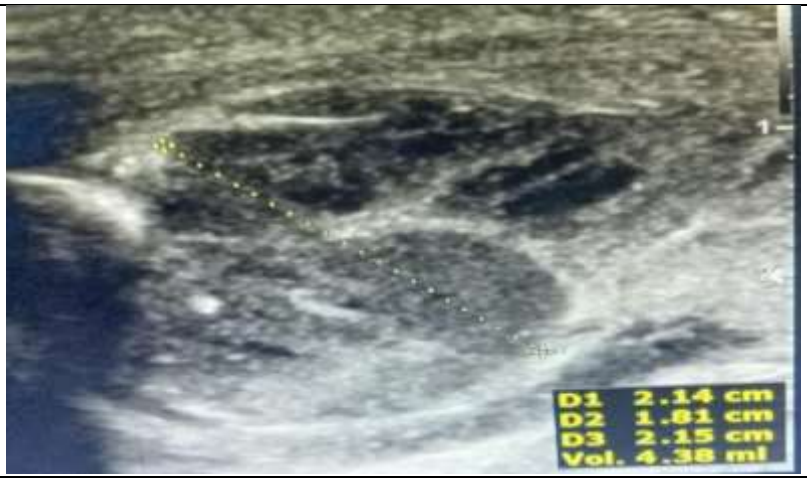

Image 3: USG shows enlarged submandibular gland with abscess

The patient underwent an incision and drainage procedure, during which 5 ml of purulent exudate was aspirated and drained. This specimen was sent for Gram staining, culture and sensitivity testing, as well as Warthin-Starry silver staining. The necrotic lymph node was excised and submitted for histopathological examination. The surgical site was thoroughly washed with normal saline and packed with povidone-iodine gauze.

Warthin-Starry staining revealed the presence of coccobacilli, while the histopathological analysis demonstrated granulomatous inflammation with areas of suppuration and palisading histiocytes. Following the procedure, the patient was closely monitored for any signs of infection and started on empiric antibiotic therapy.

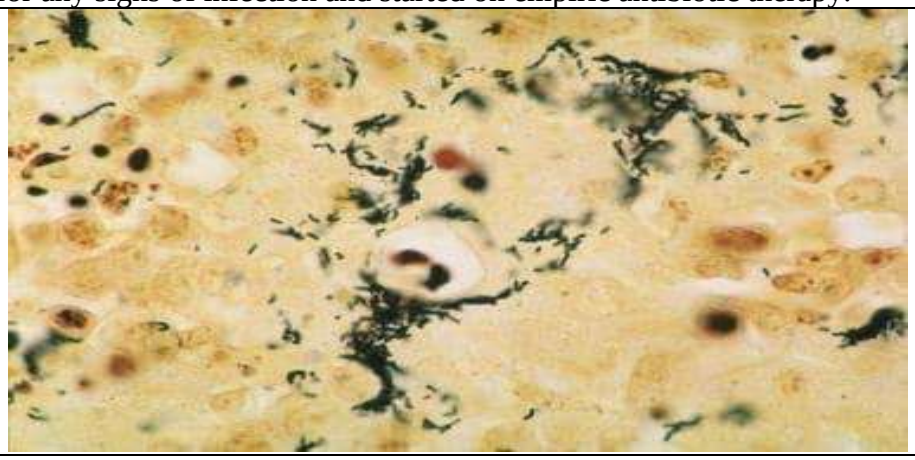

Image 4: Warthin starry staining shows coccobacilli

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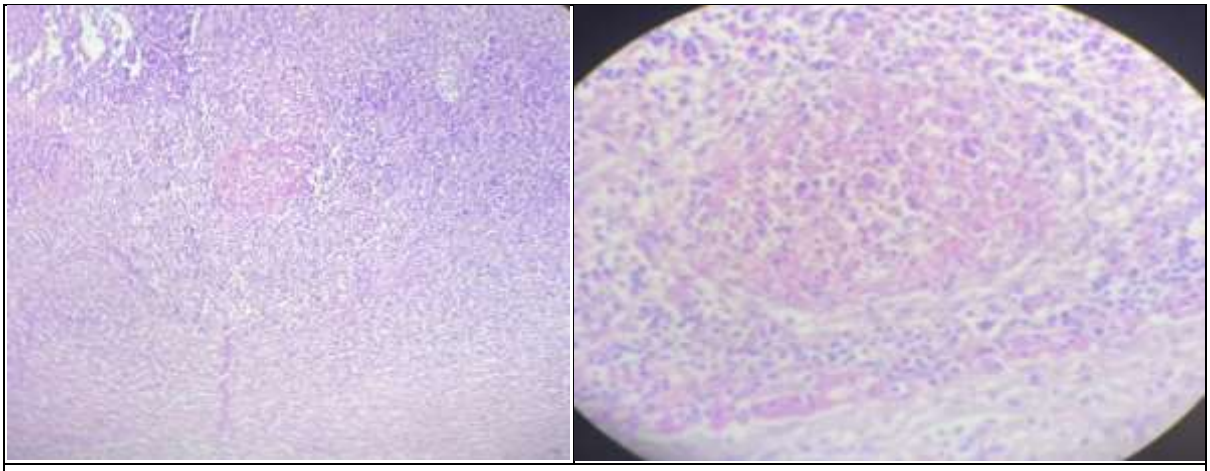

Image 5: Histology shows granulomatous lesions with suppuration and pallisading histiocytes

The wound was left open for secondary healing and managed with daily dressings. The patient showed symptomatic improvement, and after two weeks, the wound healed well without any new complaints.

Image 6 (a): Post op day 5

Image 6 (b):Post op day 12

DISCUSSION

Debré et al. first reported cat scratch disease (CSD) in 1950, identifying cats as the principal transmission vector [1]. Bartonella henselae is the causal agent of CSD, which often manifests as a self-limiting lymphadenopathy. In a small number of cases, involving immunocompromised hosts, B. henselae can produce unusual infections including osteomyelitis, endocarditis, or peliosis hepatis [2]. Prolonged painless lymphadenopathy may mimic cancer and TB [3]. CSD is the most common cause of unilateral regional lymphadenitis in children [3, 5]. Transmission is mostly by sick cats and fleas [5]. Symptoms usually emerge 1-3 weeks following a scratch or bite from an infected cat [3,5]. The diagnosis is based on history, microscopy, serology, and histological findings [3,6]. Histologically, lymph node aspirates reveal pleomorphic gram-negative bacilli on Warthin-Starry staining [7].

In 2000, Margileth et al. suggested the following criteria for a CSD diagnosis [1]:

1. Contact with cats or fleas, including scratch marks.
2. Purified protein derivative or serological testing is negative for other infectious causes of adenopathy, and PCR assay shows positive Bartonella DNA.

ISSN: 0975-3583, 0976-2833 VOL 15, ISSUE 08, 2024

3. Positive enzyme-linked immunosorbent assay or indirect IFA serological test for B. henselae (result greater than 1:64).
4. A biopsy sample of a granuloma in a node, skin, liver, or bone demonstrating granulomatous inflammation or a positive Warthin-Starry silver stain for CSD [4,5].

To confirm the diagnosis, at least three of the four criteria must be met. The immune response begins with a latent phase, followed by the synthesis of IgM and IgG. Most CSD patients have elevated IgG titres [1]. IFA is the most often used and reliable serological test for CSD, with an 88 percent sensitivity and 97 percent specificity for IgG and IgM antibodies [1]. The most sensitive assay for detecting DNA specific to B. henselae is the PCR test [5]. PCR can detect B. henselae DNA within six weeks of infection [5]. According to reports, culture is feasible but challenging [1,8].Treatment is usually not essential unless the patient is really symptomatic or presenting with abscess.

In vitro, the bacillus is susceptible to a variety of antibiotics, including penicillins, cephalosporins, aminoglycosides, tetracyclines, macrolides, quinolones, trimethoprim/sulfamethoxazole, and rifampin [3,8]. In one placebo-controlled research, azithromycin medication was associated with the most fast reduction in the size of infected lymph nodes, and it has since become the first-line treatment [1,9]. Azithromycin penetrates macrophages and neutrophils and is extremely efficient against Bartonella species in a cell-free environment [1]. This penetration approaches concentrations 40 times higher than in extracellular fluid [1,10]. The preferential concentration of azithromycin in infected lymph node tissue may account for the drug's efficacy against B. henselae [1].

CONCLUSION

Although Cat Scratch disease is generally self-limiting, it should be considered in differential diagnoses of granulomatous diseases, which often exhibit similar behaviours. Proper diagnosis and management, including surgical intervention, when necessary, lead to favourable outcomes. This case report emphasizes the significance of investigating for Cat Scratch disease in patients presenting with lymphadenopathy and submandibular gland abscess, particularly those with a history of cat exposure.

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