Case Report

Pediatric cat-scratch disease: An illness hidden among lymphadenitis

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ABSTRACT

Cat-scratch disease (CSD) is a self-limiting disease caused by *Bartonella henselae*. Its diagnosis requires a thorough history of scratch or bite, clinical examination of the primary rash before the onset of lymphadenitis, investigations, such as *Bartonella* antibody titers, and a wait-and-watch policy. Azithromycin 10 mg/kg day 1 and 5 mg/kg day 2–4 or the adult dose is recommended to treat this case. An 11-year-old boy presents with a multiple, papular, approximately 0.5 by 0.5 cm, non-pruritic, non-erythematous rash over the nape of the neck of 3 weeks, bilateral swollen cervical lymph nodes of which the largest lymph node (Bubo) on the left side of approximately 3–5 cm in the horizontal dimension of 2 weeks. *Bartonella* antibody panels came positive with *B. henselae* of immunoglobulin G titers of 1:2048. Oral azithromycin helped resolve the rash and caused a 50% reduction of the bubo by 48 h. The bubo became less prominent with treatment and observation was continued for 6 months. CSD should be considered as a differential diagnosis by physicians. The primary rash before the onset of Bubo is the signature that heralds the diagnosis of CSD. The pediatrician must investigate only if there is a strong correlation with a scratch/bite from a cat or dog.

Key words: *Bartonella* spp., Cat-scratch disease, Lymphadenitis

Cat-scratch disease (CSD) occurs due to an infection with a peculiar bacterium called *Bartonella henselae* belonging to the Bartonellaceae family. The most common presentation occurs in two patterns which manifests as the common acute/sub-acute regional lymphadenitis or parinaud's oculoglandular syndrome. *Bartonella* also causes disseminated diseases involving the liver, heart, or even the brain tissues. CSD is transmitted to humans directly through the bite/scratch of a cat/rarely dog most frequently as it is a natural reservoir or through the help of a vector called cat flea *Ctenocephalides felis* or *Canis*. Although the disease is common in the population, it still remains ignored by pediatricians due to the difficulty posed and preference for the common etiologies, such as viral, staphylococcal, streptococcal, Gram-negative, brucellosis, tuberculosis (TB) infections, and finally malignancies. The diagnosis is either entirely clinical solely with or without supportive evidence, such as excisional biopsy only when acutely tender, inflamed and using Warthin-starry stains, *Bartonella* antibodies immunoglobulin M (IgM), and immunoglobulin G (IgG) titers, or aspiration of the contents and sending for culture once ruptured. Incision and drainage are contraindicated due to the risk of sinus tract formation in a stable lymph node [1]. Only azithromycin 10 mg/kg or 500 mg day 1 (d1) followed by 5 mg/kg 250 mg day 2–4 (d2–4) for small children and adults with maximum 1 g/day is the studied drug shown to be effective within 30 days resulting in 50% reduction of the volume of the contents, but after 30 days no effects are observed [2]. There has been no Human-to-Human transmission to date. The prevalence of CSD is low (<3%) in the population [3]. Annually 22,000 cases are diagnosed in the United States [4,5]. However, in India, there is a paucity of published literature leading us to the conclusion that either the disease is extremely uncommon or is under-reported.

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CASE REPORT

An 11-year (y) old boy, born of non-consanguineous marriage 2nd by birth order normal birth weight, development normal, completely immunized, nutritionally well built, presented with a history of a peculiar papular rash over the nape of the neck of 3 weeks, and bilateral swollen cervical lymph nodes (Buboes) of 2 weeks of which the left side single bubo is prominent at presentation with no to low-grade fever and no constitutional symptoms with overall stable examination.

The rash was multiple, papular, approximately 0.5 cm by 0.5 cm, non-erythematous, non-pruritic and non-linear with small blisters with no significant secondary changes (Fig. 1). The Bubo

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was prominent on the left side only, single, initially tender, firm in consistency, mobile, and demonstrated no fluctuance (Fig. 2). The lymph node diameters were not measured initially, it was taken 1 day before starting azithromycin, sending the sample, and subsequently which was 2.5 cm on the long axis.

It was treated initially from a dispensary with oral cefixime 10 mg/kg for 10 days with no effect before admission to our hospital. After admission, he was started initially monotherapy with amoxicillin and clavulanic acid 90 mg/kg to cover *Staphylococcus*/*Streptococcus*/Gram negative coverage with no effect till 3 days of admission. Serendipitously, on further enquiry during evening rounds based on the nature of the disease after reviewing the literature and textbook material, we enquired about any significant bites from animals. His mother said that he had a history of Persian cat bites 1 month back over his left arm and scratches over his left arm and 3 weeks ago making a suspicious diagnosis of CSD. Although there was no bite or scratch marks over the neck but still, we consider this the best opportunity to investigate this case.

Other ancillary history recorded, that he was given five doses of rabies vaccine and immunoglobulin under category III dog bite protocols. Although their grandfather had TB 10 years back the parents said that they had no contact and his son was not born at that time ruling out clinically only and no investigations were performed.

During his admission, blood tests showed no positive findings apart from white blood cells showing leukocytosis 22×10^3 µ/L, raised erythrocyte sedimentation rate of 30 mm/h, and C-reactive protein of 58 mg/L with normal neutrophil and lymphocyte ratio, platelets. Blood Culture was sterile by Bactec but urine culture showed *Pseudomonas aeruginosa* which was repeated due to the lack of clinical correlation with the symptoms or possible contamination and repeated again which was found to be sterile for satisfaction purposes. Ultrasound showed cervical lymphadenopathy with only loss of fatty hilum and the largest one was 1.5–0.9 cm and opined for assessment for fine needle aspiration cytology/biopsy for TB. There were no cystic or any other changes in the lymph node. We also asked for a biopsy but the parents were not interested in an invasive procedure and it was a good thing as doing it may cause worsening of an unknown nature as stable *Bartonella* lymph nodes should be observed for resolution or aspiration only when it ruptures or starts discharging without doing any incision and drainage.

Based on this history mentioned, we asked for investigating CSD by antibody test and the parents accepted, his sample was sent to a private lab for *Bartonella* testing on the 5th day of admission which came positive for *Bartonella* IgG antibodies in 1:2048 titers (Fig. 3) suggesting recent infection within a 1 month of discharge from hospital. During the hospitalization (D5), after sending the sample by afternoon Tablet (Tab.) Azithromycin

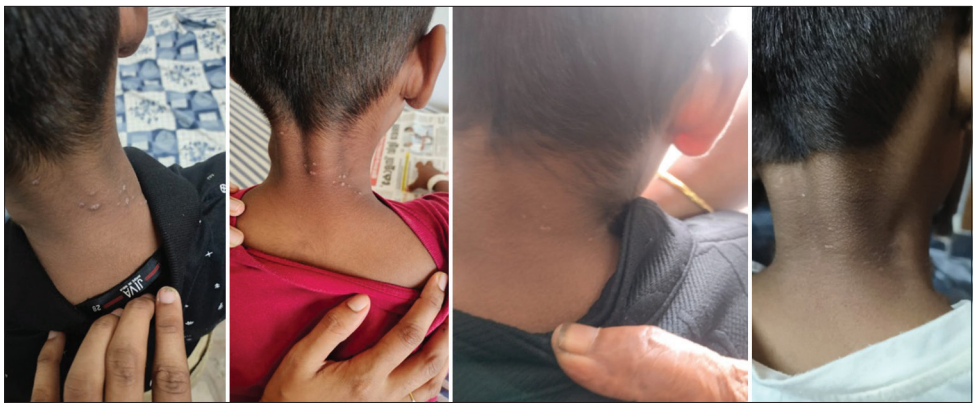
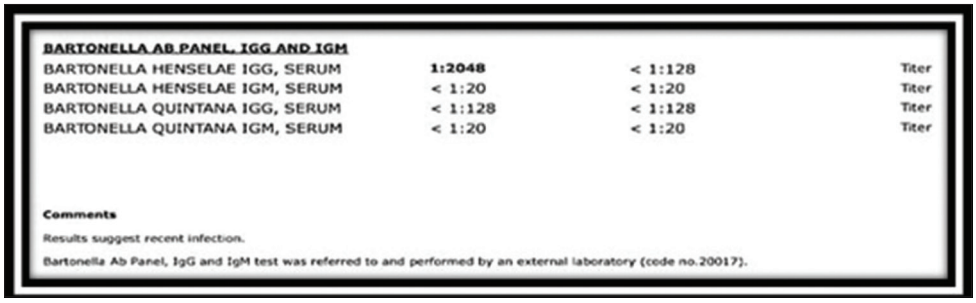


Figure 1: Multiple, papular, non-erythematous, non-pruritic, non-linear rash of approximately 0.5 cm by 0.5 cm, with small blisters

Figure 2: The Bubo was prominent on the left side only, single, initially tender, firm in consistency, mobile, and demonstrated no fluctuance



BARTONELLA AB PANEL, IGG AND IGM

BARTONELLA HENSELAE IGG, SERUM	1:2048	< 1:128	Titer
BARTONELLA HENSELAE IGM, SERUM	< 1:20	< 1:20	Titer
BARTONELLA QUINTANA IGG, SERUM	< 1:128	< 1:128	Titer
BARTONELLA QUINTANA IGM, SERUM	< 1:20	< 1:20	Titer

Comments

Results suggest recent infection.

Bartonella Ab Panel, IgG and IgM test was referred to and performed by an external laboratory (code no.20017).

Figure 3: The sample was sent to a private lab for *Bartonella* testing on the 5th day of admission which came positive for *Bartonella* immunoglobulin G antibodies in 1:2048 titers

adult dose was given as 500 mg on day 1 and 250 mg for the remaining 4 days, which caused resolution of the rash after 48 h with no sequelae and decrease in the volume and prominence of the bubo which maximum horizontal dimension of 2.5 cm. He was discharged on D7 of admission after completing 3 doses of azithromycin (Fig. 2).

On further regular follow-ups, both the rash stayed the same with no further changes (Fig. 1) and the bubo size remained static and became less conspicuous at size 2.5 cm after 7 days, 1 month, and after 6 months (at home picture taken through WhatsApp, no measurement taken) from the onset with no sequelae (Fig. 2).

DISCUSSION

Bartonella spp. is responsible for emerging and re-emerging diseases around the world caused by *B. henselae*, *Bartonella quintana*, and *Bartonella bacilliformis*, although other *Bartonella* spp. in human beings [6]. *B. henselae* dates back a quarter of a century as the responsible agent of CSD, a clinical entity described in the old books for more than half a century [7]. Cat scratch disease was identified which dates to the 1930s, and its relation with cats was identified in the 1950s. Cat scratches should be considered in the differential diagnosis of any acute, subacute, or chronic lymphadenopathy [8-10]. The common differential diagnosis is bacterial lymphadenitis, atypical mycobacterial infections, brucellosis, tularemia, sporotrichosis, Epstein Barr virus, and *cytomegalovirus* infections.

We are reporting this unique case from southern Kerala as it was the 1st time we have met with this case. Although there are only not too few cases of pediatric CSD discussed till now in 2024 adult patients are reported to be diagnosed and treated. The recent cases are recorded in the year 2015 by Patel *et al*. [11] 2016 by Świątkowski *et al*. [12] in 9 years, 2019 by Ranjini *et al*. [13] in 24 years, 2021 by Mahjoub *et al*. [14], 2022 by Nakata *et al*. [15], 2023 by Lakshmi and Abraham [16] in a 23 year in Kerala, India and 2024 by Zhou *et al*. [17].

Bartonella, CSD at present is still yet to be recognized as an emerging vector-borne disease in India. CSD often goes underreported or undiagnosed by Noden *et al*. [18]. There are no strong established gold standard investigations Hoey *et al*. [19] apart from doing culture which takes a long time, antibody titers by enzyme or radioimmunoassay which can be negative in most cases unless IgM or sub-acute, chronic onset shows IgG elevations. There are only a few modalities available and careful monitoring of bubo and proper treatment is all that is required in the pediatric age group. Other rare complications are erythema nodosum, infective endocarditis, arthralgia, hepatomegaly called peliosis hepatis, pneumonia, and osteomyelitis [20]. The strength of this case report is that for the 1st time, we have used only *Bartonella* antibody titers. Overall, the child rash has healed and the bubo is still there and undergoing observation. Limitations are that no excisional biopsy and its contents were taken for documentation. No TB/other investigations were carried out.

CONCLUSION

CSD should be considered as a differential diagnosis by physicians. The primary rash before the onset of Bubo is the signature that heralds the diagnosis of CSD. The pediatrician must investigate only if there is a strong correlation with a scratch/bite from a cat or dog.

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