Cat scratch disease: magnetic resonance imaging findings

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Abstract. Cat scratch disease is an infectious lymphadenitis frequently occurring in children and adolescents. We present the magnetic resonance imaging findings of two patients with this disease. In both cases, lymphadenopathy was characterized by extensive stranding of the surrounding soft tissues, consistent with the inflammatory nature of this condition. Magnetic resonance imaging can be diagnostic and may obviate the need for invasive means of evaluation in patients suspected of having cat scratch disease.

Key words: Cat scratch disease – Infectious lymphadenopathy – Magnetic resonance imaging

Cat scratch disease is an infectious disorder which occurs frequently in children and adolescents. The entity is characterized by lymphadenitis and the formation of a pustule or papule of the skin occurring after exposure to a scratch by an animal, usually a cat. In most instances, the diagnosis is easy to make on clinical grounds based on the characteristic history. However, in some cases, the history of an animal scratch cannot be elicited from the patient and imaging studies may be performed for further evaluation. We present two patients in whom the diagnosis of cat scratch disease was suspected after magnetic resonance imaging demonstrated inflammatory lymphadenitis.

Case reports

Case 1

A 21-year-old woman presented to the emergency department with a painful “growth” in the anterior part of her left thigh. She indicated that the mass had appeared 1–2 weeks previously and she related no history of trauma. During this time, she experienced at least one episode of fever (to 38°C). On physical examination, a fixed swelling measuring 4x4 cm was noted in the anterior aspect of the upper thigh, associated with local warmth and edema. No inguinal lymph nodes could be palpated, and there was no evidence of lymphatic streaks on the skin. Aspiration of the mass with a needle produced no material or cells. All routine blood laboratory tests were normal. She was treated empirically with oral broad spectrum antibiotics and was instructed to apply hot compresses to the area.

One week later, the patient returned to the hospital complaining of continued increase in the size of the mass to approximately 5 cm. Magnetic resonance imaging of the upper thighs was performed, which demonstrated that the “mass” was made up of two enlarged femoral lymph nodes, each approximately 2–3 cm in diameter, and multiple smaller nodes in the inguinal chain seen best on T1-weighted images (Fig. 1A, B). The lesions displayed increased signal intensity on T2-weighted images and there was marked stranding in the surrounding soft tissues suggestive of inflammation and edema (Fig. 1C). Further questioning revealed that the patient had been scratched by a kitten on her left leg approximately 1 week prior to the first symptoms.

Needle aspiration of one of the left femoral lymph nodes was performed, producing dark, bloody material. Cytologic examination showed sheets of polymorphonuclear cells, marked acute inflammation with some necrosis, and clusters of epithelioid histiocytes. There was no evidence of malignancy. Further pathologic evaluation of the aspirate determined that the findings were consistent with cat scratch disease. No specific therapy was provided and complete resolution of the mass was noted on physical examination at a follow-up clinic visit approximately 1 month later.

Case 2

A 10-year-old boy presented to the emergency department after injuring the medial aspect of his left elbow playing football. Examination of the boy’s extremities revealed multiple raised and excoriated lesions consistent with insect bites and a 4-cm “mass” on the medial aspect of the distal humerus. This lesion was associated with marked swelling, heat, and erythema. Radiographic evaluation of the arm and blood laboratory work were negative. The patient was begun empirically on oral antibiotics and he returned to the pediatric surgery clinic 1 week later with little improvement. It was felt that the mass represented a lymph node and needle aspiration at this time revealed evidence of marked acute and chronic inflammation and no evidence of neoplasia. The patient denied any history of fever and chills or other constitutional
Fig. 1 A–C. Case 1. A Coronal and B axial T1-weighted spin echo (TR/TE 500/15) magnetic resonance images demonstrating enlarged lymph nodes (arrows) in the left inguinal region (compare with normal right inguinal nodes in A). On axial T2-weighted spin echo (TR/TE 2500/90) image (C), the lymph nodes display increased signal intensity. Note extensive stranding of surrounding soft tissues on all images, suggestive of an inflammatory process.

Fig. 2 A, B. Case 2. A Axial T2-weighted spin echo (TR/TE 2500/90) image and B corresponding gadolinium-DTPA-enhanced T1-weighted (TR/TE 500/15) image of distal left upper arm showing enlarged lymph node (between straight arrows). There is extensive stranding in the surrounding soft tissues, suggestive of an inflammatory etiology. Necrotic areas (curved arrows) in the lymph node are visualized on the enhanced image.

Discussion

Cat scratch disease is a predominantly regional infectious lymphadenitis caused by a pleomorphic gram-negative bacillus. The disease was first described in 1950 by Debré et al. [1]. The condition is generally initiated by a cat scratch with resultant inoculation with the responsible organism. The papule or pustule representing the inoculation and regional adenopathy begin to develop over the subsequent 3–10 days [2].

The diagnosis of cat scratch disease is generally made on clinical grounds by verifying the presence of at least three of the following four features (diagnostic criteria): (a) history of exposure to animal scratch (usually a kitten), (b) demonstration of a dermal or ocular inoculation site, (c) presence of single or regional lymphadenopathy, and (d) a positive cat scratch disease skin test [3]. Other criteria used in making this diagnosis include: biopsy of the skin lesions or lymph nodes with demonstration of histopathologic findings characteristic of the disease, demonstration of the presence of the offending bacillus, and failure to demonstrate other causative agents [4].