Orthopaedics & Traumatology: Surgery & Research 101 (2015) 519–522

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Case report

Bartonella henselae osteoarthritis of the upper cervical spine in a 14-year-old boy

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ARTICLE INFO

Article history:
Received 13 August 2014
Accepted 19 February 2015

Keywords:
Osteoarthritis
Bartonella henselae
Cervical spine

ABSTRACT

We report a case of *Bartonella henselae*, an agent of cat scratch disease, C1-C2 osteoarthritis with osteolysis of the lateral mass of C2 in a 14-year-old boy. Oral antibiotics did not successfully treat the infection and surgery was necessary to treat the septic arthritis. The case opens discussion about bacterial osteoarthritis of the cervical spine and bone involvement in disseminated bartonellosis.

1. Introduction

Cat scratch disease is a common infection that mainly affects children: 80% of patients are under 18. Surgical treatment is rare [1]; we report a case of C1-C2 osteoarthritis with osteolysis of the lateral mass of C2. We discuss the diagnostic and therapeutic management of *Bartonella henselae* (*B. henselae*) infection with cervical spine involvement and provide a review of the literature.

2. Case study

A 14-year-old boy with no prior medical history consulted his family physician for a cat scratch of the pinkie associated with neck pain and was treated locally with oral antibiotic (azithromycin). He was referred to our unit due to persistent cervicalgia, torticollis and an inflammatory syndrome.

At admission, the patient was feverish with a deteriorated general condition on clinical examination. There was a cut that had healed on the dorsal side of the right pinkie, a right supracondylar adenopathy, torticollis and cervicalgia. Range of motion of the cervical spine was reduced. The neurological examination was normal. The rest of the clinical examination was normal.

Biological tests showed C-Reactive protein level 111 mg/L and WBC 7900/mm^3. Serological tests for *B. henselae* were negative.

CT scan of the cervical spine performed at admission (Fig. 1) showed joint effusion and osteolysis of the lateral mass of C2 (Fig. 2). MRI confirmed the effusion and osteolysis. There was no sign of epiduritis.

Surgery was decided to drain the fluid collection. It was performed 48 hours after antibiotics were discontinued and immobilization with cervical traction had been performed. A posterior approach was taken to the cervical spine. A purulent effusion was found around the right C1-C2 articulation. The lateral mass of C2 presented with 50% osteolysis. Bacteriological and pathological specimens were obtained. Because of the significant bone loss of C2, treatment was completed by a halo-cast for 3 months. Triple intravenous antibiotic treatment was begun following surgery including: amoxicillin-clavulanic acid, ciprofloxacin, and gentamicin.

Bacteriological tests were positive for *B. henselae*. The outcome was favorable with regression of general symptoms and pain. The patient left the hospital after 15 days of intravenous antibiotic treatment, which was switched to oral bi-therapy associating amoxicillin-clavulanic acid and ciprofloxacin for 2.5 months. Three months after surgery, cervicalgia had disappeared, biological tests were negative and CT scan showed partial reconstruction of the lateral mass of C2 (Fig. 3). The halo-cast was removed at the follow-up consultation and replaced by a soft neck brace for three more months. At postoperative month 6, the clinical examination was normal and reconstruction of the lateral mass of C2 was considered to be sufficient to remove the soft neck brace.

3. Discussion

Most cases of bacterial osteomyelitis occur before the age of 5 and involve the lower limbs. Osteomyelitis of the cervical spine usually presents as a torticollis [2], and may be complicated by

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http://dx.doi.org/10.1016/j.otsr.2015.02.007
1877-0568/

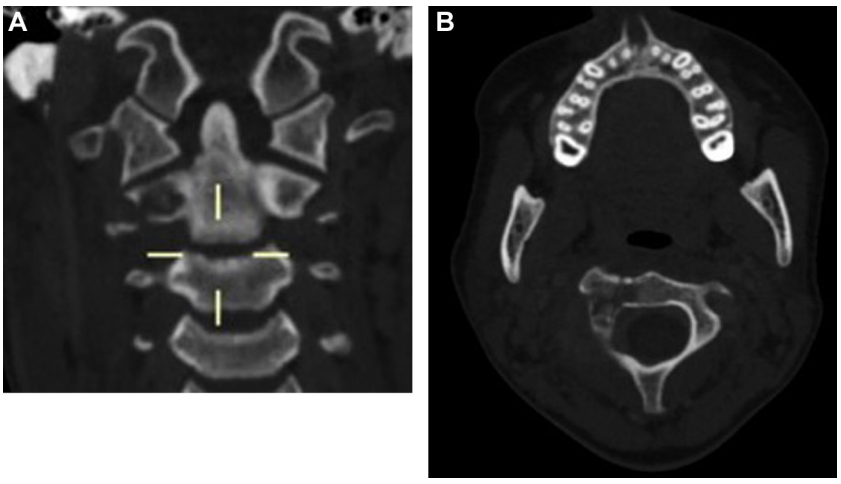

Fig. 1. CT scan before treatment. A. Coronal plane. B. Axial plane. Osteolysis of the C2 lateral mass.

Table 1
Location of *B. henselae* spinal infections in relation to age.

	Children	Adults
Mean age	8.2 ± 2.9	32.3 ± 12.5
Cervical	3	1
Thoracic	15	7
Lumbar	4	1
Total	22	9

medullary involvement, which is nevertheless rare [1]. The case reported here involves the right C1-C2 cervical spine without neurological injury.

Indeed, osteomyelitis involving the atlas and/or the axis is very rare, and only a few cases have been reported in the literature, usually secondary to an ENT abscess [3–5].

The best diagnostic test is magnetic resonance imaging (MRI) [6], which provides imaging of soft tissue damage, bone loss and the risk of medullary compression by an epidural abscess. It is the most sensitive examination for the detection of vertebral osteomyelitis [7].

Cervical spine osteomyelitis is often secondary to dissemination of a retropharyngeal abscess following an ENT infection [8,9].

Table 2
Surgically managed cases of *B. henselae* osteomyelitis.

Authors	Age	Clinical	Imaging	Surgery	Antibiotics	Immobilisation
Modi [14]	4 years	Fever; dorsalgias	CT scan: T10: lysis of T10 muscle abscess	Drainage of abscess and bone excision	Per os: rifampicine, 10 days and azythromicine, 5 days	None
Abdel-Hacq [15]	5 years	Fever; abdominal pain	IRM: epidural abscess and T4-T7 osteomyelitis	Drainage of abscess	IV: ceftriaxon/vancomycin Per os: clarythromycin, 15 days Per os: trimethoprim/ sulfamethoxazole, 10 weeks	None
Vermeulen [16]	9 years	Cervicalgia, fever, right paresia and loss of reflexes	MRI: osteomyelitis C4-C6 with para vertebral C5-C6 abscess compressing the vertebral foramen	Drainage of abscess	IV: amoxicillin-clavulanic acid, 3 weeks	Soft neck brace 3 weeks
Bernini [17]	5 years	Dorsalgia, fever	CT: T9: osteolysis of the lamina and epidural abscess	Drainage of the abscess and laminectomy T9-T10	IV: ceftriaxon, 3 weeks	None
Tasher [18]	5 years	Cervicalgia, fever	MRI: epidural abscess C1-C2 to C5-C6	Drainage of abscess and laminectomy C3-C5	IV: gentamicin and rifampicin 4 weeks Per os: rifampicin and azythromycin, 6 weeks	None
Al-Rahawan [19]	7 years	Dorsalgia, fever	MRI: paravertebral T5-T9 abscess with compression of the body of the vertebra at T7	Drainage of abscess	Per os: azythromycin, 14 days	None
Reported observation	14 years old	Cervicalgia, torticollis, deterioration of general condition	MRI: C1-C2 osteoarthritis osteolysis of the lateral mass of C2 and paravertebral abscess	Drainage of abscess Excision of bone	IV: amoxicillin-clavulanic acid, ciflox, gentamicin, 10 days Per os: amoxicillin-clavulanic acid, ciflox, 2 months	Halo-cast, 3 months