Case Report

Facial Diplegia as Initial Manifestation of Acute, Myelomonocytic Leukemia with Isolated Trisomy 47, XY,+11[14]/46, XY[6]

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Abstract

Bilateral peripheral facial palsy (facial diplegia) has been repeatedly reported as a neurologic manifestation of acute myeloid leukemia but has not been reported as the initial clinical manifestation of myelomonocytic leukemia. A 71-year-old male developed left-sided peripheral facial palsy being interpreted and treated as Bell's palsy. C-reactive protein (CRP) and leukocyte count 4 days later were 2.5 mg/l and 16 G/l, respectively. Steroids were ineffective. Seven days after onset, he developed right-sided peripheral facial palsy. Three days later, CRP and leukocyte count were 234.3 mg/l and 59.5 G/l, respectively. Cerebrospinal fluid investigations revealed pleocytosis (62/3) and elevated protein (54.9 mg/dl). Two days later, pleocytosis and leukocytosis were attributed to myelomonocytic leukemia. Leukemic meningeosis was treated with cytarabine and methotrexate intrathecally. In addition, cytarabine and idarubicin were applied intravenously. Under this regimen, facial diplegia gradually improved. Facial diplegia may be the initial clinical manifestation of myelomonocytic leukemia, facial diplegia obligatorily requires lumbar puncture, and unilateral peripheral facial palsy is not always Bell's palsy. Patients with alleged unilateral Bell's palsy and slightly elevated leukocytes require close follow-up and more extensive investigations than patients without abnormal blood tests.

Keywords: *Bell's palsy, chemotherapy, facial palsy, leukemia, leukemic meningeosis*

Introduction

Facial palsy is a common disease with a favorable outcome in the majority of the cases. Usually, it occurs unilaterally, but rarely bilateral facial palsy (facial diplegia) has been reported. The most common cause of unilateral facial palsy is Bell's palsy. The most common cause of facial diplegia is sarcoidosis, but there are a number of rare other causes of facial diplegia [Table 1]. One of the rare causes of facial diplegia is leukemia. Facial diplegia has been reported as a neurologic manifestation of acute myeloid leukemia (AML)[1-3] and of acute lymphoid (lymphoblastic) leukemia (lymphoma).[4-7] Facial diplegia from leukemia may be due to mastoid infiltration,[1] due to leukemic meningitis,[8] or due to bilateral focal lesion of the facial nucleus. Depending on the location of the infiltration with leukemic cells, the cerebrospinal fluid (CSF) may be normal or may show leukemic cells as well. Although facial diplegia has been reported as initial manifestation of acute T-cell leukemia,[8] it has not been reported as initial manifestation of acute myelomonocytic leukemia.

Case Report

A 71-year-old Caucasian male presented at the ambulatory ward with left-sided peripheral facial palsy with incomplete lid closure after a bronchial infection without taking antibiotics 4 days before. Bell's palsy was diagnosed, and treatment with steroids (25 mg prednisolone over 10 days) and physiotherapy was initiated. Three days later, he also developed a

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Table 1: Causes of facial diplegia

Condition[9,10]
Vascular
Bifocal stroke of the pontine tegmentum
Tegmental pontine hemorrhage (16 syndrome)
Wegener granulomatosis
Bilateral carotid artery dissection
Neuropathy
SOD1-associated amyotrophic lateral sclerosis
Fabry disease
Lambert–Eaton syndrome
Acute inflammatory demyelinating neuropathy
Progressive hypertrophic neuropathy (Dejerine–Sottas)
Malignancy
Leukemia
Intoxication
Ethylene glycol
Snake bite (timber rattle)
Paclitaxel
Ipilimumab
Risperidone
Immunological
Guillain–Barre syndrome
Miller Fisher syndrome
Melkersson–Rosenthal syndrome
Sarcoidosis
Multiple sclerosis
Sjögren syndrome
Brainstem encephalitis
Systemic lupus erythematosus
Infections
Borreliosis
Malaria
AIDS
Cytomegalic virus infection
Trichinosis
Staphylococcus meningitis
Influenza
Mononucleosis
Syphilis
Poliomyelitis
Ehrlichiosis
Herpes simplex infection
Epstein–Barr virus infection
Cryptococcal infection
Tuberculosis
Bilateral otitis media
Metabolic
Diabetes
Acute porphyria
Myopathy
Facioscapulohumeral muscular dystrophy
Inclusion body myositis
Congenital myotonic dystrophy
Myotubular myopathy
Nemaline myopathy
Limb-girdle muscular dystrophy
Other
Trauma
Bell's palsy
Relapsing polychondritis
Andermann syndrome
Möbius syndrome
Tangier disease
Stevens–Jonson syndrome
Crouzon syndrome
Amyloidosis
Foix–Chavany–Marie syndrome
Hansen's disease
Idiopathic intracranial hypertension

right-sided peripheral facial palsy of the same degree. Another 3 days later (6 days after the first visit), he again attended the ambulatory ward (hospital day [hd] 1). Blood tests showed increased C-reactive-protein and white blood cell (WBC) counts [Table 2]. Cerebral magnetic resonance imaging (MRI) revealed mild diffuse atrophy and multiple, gliotic spots in a bilateral frontotemporal distribution. CSF investigations showed mild pleocytosis and elevated protein [Table 2]. Due to a history of recurrent tick bites over the last years, he additionally received ceftriaxone (2 g/d) intravenously during 7 days and acyclovir (1500 mg/d) intravenously during 7 days. His previous history further revealed cervical disc extraction in 1981 complicated by recurrent abscess formation and antibiotic treatment until 2010, lumbar disc extraction in 2006, prostatectomy in 2009, knee endoprosthesis in 1/2014, hyperuricemia, and phimosis. In addition to facial diplegia, neurologic examination showed bilateral hypoacusis, mild weakness for hip flexion on the right side, and generally reduced tendon reflexes.

Cervical MRI on hd 2 revealed paradox kyphosis, anterolisthesis C3/4 with consecutive vertebrostenosis and stenosis of the neuroforamina, partial block vertebrae C4–6 with resected spinous processes, discrete myelopathy, hydromyelia C3–7, an enhancing, intramedullary mass lesion C5, and bone marrow edema C7/Th1. Computed tomography scans of the thorax and the abdomen revealed extensive pneumonia, mediastinal and hilar lymphadenopathy, mild pericardial effusion, and hepatosplenomegaly. Differential WBC count showed a population of approximately 80% immature monocytic cells. Therefore, the patient was transferred to the hematological unit on hd 3 where myelomonocytic leukemia was diagnosed upon bone marrow analysis

Table 2: Blood chemical values and some cerebrospinal fluid values, which influenced decision-making

Parameter (normal range)	8/2000	10/2000	10/2006	4/2014	5/2014	5/2014	5/2014
Leukocytes serum (4-9 G/L)	5.3	3.7	3.7	16.0	59.5	55.0	NA
Erythrocytes (4.2-5.5 T/L)	4.45	3.57	3.57	4.03	4.14	3.87	NA
Hemoglobin (14-17 g/dl)	13.6	12.5	11.5	12.1	12.2	11.2	NA
Hematocrit (40%-50%)	39.6	33.3	33.3	36.8	37.5	34.6	NA
Thrombocytes (150-400 G/L)	352	210	220	135	133	103	NA
C–reactive protein (0-5 mg/L)	18.5	NA	NA	2.5	234.3	279.6	NA
Potassium (3.5-5.5 mmol/L)	4.4	NA	NA	4.5	3.8	3.3	NA
Sodium (135-150 mmol/L)	138	NA	NA	138	131	139	NA
CSF							
Leukocytes (<13/3)	NA	NA	NA	NA	69/3	NA	5/3
Protein (20-40 mg/dl)	NA	NA	NA	NA	54.9	NA	NA

NA: Not available, CSF: Cerebrospinal fluid

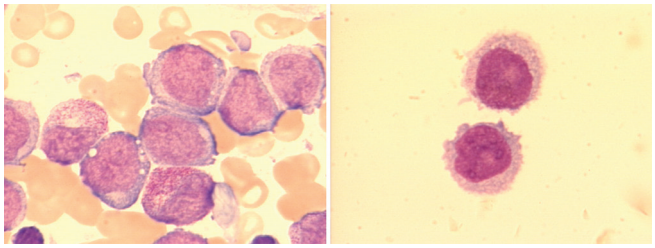

Figure 1: Leukemic blast cells of the patient in bone marrow (left panel) and spinal fluid (right panel)

on hd 4 [Figure 1]. Further CSF analysis showed 69/3 cells, expressing various immature myeloid antigens (HLA-DR$^+$, CD13$^+$, CD117$^+$, MPO$^+$, and LZ$^+$) confirming the suspected leukemic meningeosis. Cytogenetic investigations revealed isolated trisomy 11 in 14 of 20 analyzed metaphases (karyotype: 47, XY,+11[14]/46, XY[6]). Since hd 7, the patient developed mild quadriparesis starting on the left upper limb (M3). Leukemic meningitis was treated with cytarabine (40 mg), methotrexate (15 mg), and dexamethasone (4 mg) intrathecally on hd 4 and hd 17. Systemic antileukemic therapy consisted of cytarabine (100 mg/m^2/day for 7 days) and idarubicin (12 mg/m^2 on 2 days) according to the 2 + 7 scheme between hd 4 and hd 10. This treatment led to the improvement of facial diplegia. Although the leukocyte count in the CSF continuously declined [Table 2], quadriparesis did not improve before hd 13. On hd 37, bone marrow aspiration demonstrated partial remission.

Discussion

The presented case is interesting for several aspects. First, it is a rare case of facial diplegia. In general, facial diplegia may be caused by a number of different conditions including infections, vascular problems, and immunological abnormalities [Table 1], of which sarcoidosis is the most frequent.[11] Second, facial diplegia was due to meningeal spread of myelomonocytic leukemia. Although facial diplegia has been repeatedly reported as a manifestation of AML or lymphoid leukemia,[1-7] only one case has been reported so far, in which this neurologic presentation occurred as a primary manifestation before the diagnosis of acute myelomonocytic leukemia.[2] Only unilateral facial palsy has been reported in association with myelomoncytic leukemia.[12] Only in a single case with T-cell leukemia was facial diplegia the initial manifestation of the disease.[7] Compared to lymphoid leukemia, myelomonocytic leukemia carries an increased risk of extramedullary involvement including spreading to the central nervous system (CNS). Third, the patient carried an isolated trisomy of chromosome 11, which occurs in <1% of the cases with AML.[13] Extramedullary manifestations have been described in these patients but never leukemic meningeosis. Disregarding the extent of the spreading, the prognosis of these patients is poor.[13]

The cause of quadriparesis remains unclear, but limb weakness was attributed either to the spinal lesion at C5 being interpreted as a leukemic focus or due to infiltration of the spinal roots or the plexus bilaterally by monoblasts. Infiltration of the plexus by leukemic cells has been previously reported in monoblastic leukemia.[14] Arguments for a C5 lesion are that it was not found on previous imaging studies and that CNS infiltration has been previously reported in myelomonocytic leukemia.[15] An argument against the C5 lesion is that clinically not only C5-innervated muscles were affected. Arguments for radiculopathy or bilateral plexopathy are that it has been previously described as a manifestation of leukemia,[16,17] that tendon reflexes were generally reduced, and that it would explain quadriparesis. An argument against plexopathy, however, is that sensory functions were intact.

The reason why monoparesis of the left upper limb did not immediately respond to chemotherapy

remains unknown, but several speculations can be raised to explain drug resistance. First, the follow-up interval after initiation of treatment was too short to observe a beneficial effect. Second, upper limb weakness was not due to leukemia but due to other causes, such as spinal stroke, a paraneoplastic phenomenon, or due to radiculitis or plexopathy from infectious or noninfectious causes. Third, the dosage of chemotherapeutics reaching the intraspinal lesion was too low to exhibit a beneficial effect. In case monoparesis was due to a plexus lesion, it is conceivable that chemotherapeutics were not able to cross the blood-nerve barrier why monoblasts could have escaped from chemotherapeutic agents.[12]

This case shows that facial diplegia may be the initial clinical manifestation of myelomonocytic leukemia and that unilateral peripheral facial palsy is not always Bell's palsy. Patients with alleged unilateral Bell's palsy, refractory or progressive unilateral facial palsy, or facial diplegia require close follow-up and more extensive investigations including differential blood counts and lumbar and bone marrow punctures.

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Conflicts of interest

There are no conflicts of interest.

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