

Case Report

Facial Palsy as a Presentation of Relapsed Pediatric AML

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Abstract:

Facial palsy is a rare manifestation of the central nervous system (CNS) involvement of pediatric leukemia, characterized by the infiltration of leukemic cells in the nervous system. We report clinical presentation, treatment, and outcomes of two cases of relapsed AML presenting facial palsy. Two patients (10-year-old girl and 2-year-old boy) presented facial palsy, lower motor neuron type, at 4 and 1 months after completing acute myeloid leukemia (AML) treatment. The initial diagnosis was AML, M 0 and M 5, respectively, without CNS involvement and in remission after 4 courses of intensive chemotherapy. Isolated CNS relapse was revealed by CSF cytology. Treatment was started with re-induced systemic chemotherapy, intrathecal chemotherapy comprising cytarabine, hydrocortisone and methotrexate with craniospinal irradiation. Subsequently, both had bone marrow relapse at 3 and 2 months, respectively, after CNS relapse and died from the disease.

Keywords : ● Facial palsy ● Acute myeloid leukemia ● Children

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รายงานผู้ป่วย

Facial Palsy as a Presentation of Relapsed Pediatric AML

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บทคัดย่อ

ภาวะอัมพาตใบหน้าครึ่งซีก (facial palsy) เป็นภาวะที่พบได้ในผู้ป่วยเด็กโรคมะเร็งเม็ดโลหิตขาวเกิดจากเส้นประสาทที่เจ็ดยอดกดทับรายงานนี้เป็นรายงานผู้ป่วยเด็ก 2 รายที่ได้รับการวินิจฉัยมะเร็งเม็ดเลือดขาวชนิดมัยอีลอยด์ (acute myeloid leukemia, AML) ที่กลับมาเป็นซ้ำโดยมีอาการนำเป็นภาวะอัมพาตใบหน้าครึ่งซีก ผู้ป่วยเด็กหญิงไทยอายุ 10 ปี และเด็กชายไทยอายุ 2 ปี ได้รับการวินิจฉัย AML ชนิด M0 และ M5 ตามลำดับ โดยไม่มีอาการทางระบบประสาทเมื่อแรกวินิจฉัย ผู้ป่วยมีภาวะหน้าเบี้ยวที่ 4 และ 1 เดือนหลังครบการรักษามะเร็งเม็ดเลือดขาว ผู้ป่วยได้รับการวินิจฉัยเป็นมะเร็งเม็ดเลือดขาวกลับเป็นซ้ำโดยการตรวจน้ำไขสันหลัง ผู้ป่วยทั้งสองได้รับการรักษาด้วยเคมีบำบัด ร่วมกับการให้ยา cytarabine, hydrocortisone และ methotrexate เข้าทางไขสันหลัง และฉายรังสีที่สมองและไขสันหลัง ผู้ป่วยทั้งสองรายมีโรคกลับเป็นซ้ำในไขกระดูกและเสียชีวิตที่ 3 และ 2 เดือนหลังโรคกลับเป็นซ้ำที่ระบบประสาท

คำสำคัญ : ● Facial palsy ● Acute myeloid leukemia ● Children

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Introduction

Acute leukemia is the most common malignancy among children and is classified in two major subtypes: acute lymphoblastic leukemia (ALL) and acute myeloblastic leukemia (AML) with incidence of about 76.7 and 8.9 per million children, respectively, in Thailand.¹

Central nervous system (CNS) involvement in leukemia, for example, facial palsy, is a rare presentation,^{2,3} defined by positive for blast cells in the cerebrospinal fluid with or without focal neurological deficit.⁵ In addition, CNS presentations are associated with high risk features and poor prognosis. We report two cases of relapsed AML presenting facial palsy.

Case Presentation

Case 1

A 10-year-old girl presented subacute fever, anemia and mild hepatosplenomegaly. Initial CBC showed white blood cell count $1.33 \times 10^9/L$, absolute neutrophil count $0.239 \times 10^9/L$, hemoglobin 8.7 g/dL, platelet count $202 \times 10^9/L$ with no blast cell in the peripheral blood smear. Bone marrow aspiration was performed and immunophenotypic study was compatible with acute myeloblastic leukemia (M-4 subtype). At time of diagnosis, CSF cytology was negative for malignancy. Chemotherapy according to the Thai Pediatric Oncology Group (ThaiPOG) protocol for AML was started. Bone marrow at the end of induction-I was in morphological remis-

sion. After induction-II chemotherapy, she developed right lower motor neuron facial palsy. Because CSF cytology and computerized tomography of the brain were unremarkable, oral prednisolone (2 mg/kg/day) was started with the diagnosis of Bell's palsy. Her symptoms improved and corticosteroid treatment was discontinued after two weeks. Chemotherapy treatment for AML was resumed and completed. Subsequent CSF cytology was negative for leukemic cell.

Four months after treatment completion, she developed left lower motor neuron facial palsy. Magnetic resonance imaging (MRI) of the brain and whole spine revealed a 1.5 x 1.5-cm high signal intensity in a T2W lesion at the left globus pallidus (Figure 1), several small abnormal signal intensity foci in the right frontoparietal lobe and deep white matter in the left temporal lobe (Figure 2). Despite normal blood cell count, myeloblast cells were identified in bone marrow and CSF examination. Combined CNS and bone marrow relapse of AML was diagnosed. Chemotherapy for relapsed AML consisted of methotrexate and L-asparaginase given in conjunction with triple intrathecal chemotherapy (methotrexate, cytarabine, and hydrocortisone). She achieved second remission and allogeneic bone marrow transplantation was planned. While she was waiting for allogeneic bone marrow transplantation, she developed a second bone marrow relapse at the time and died of the disease one year after initial diagnosis.

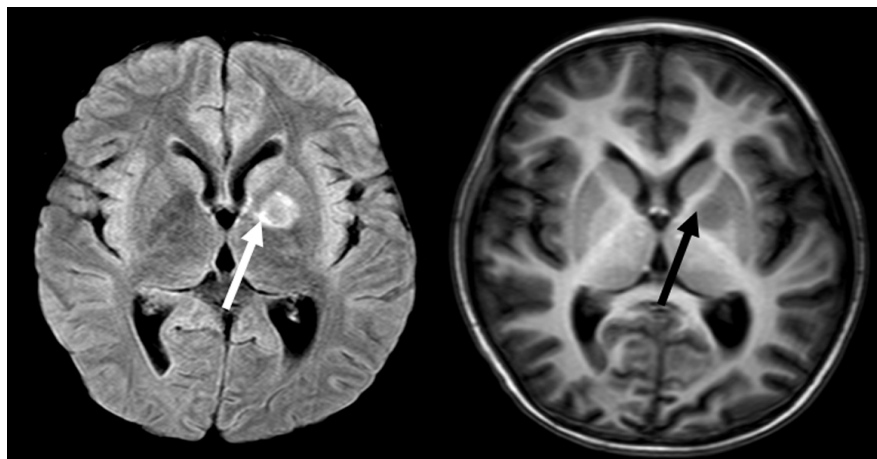


Figure 1 MRI brain T2W/flair(Left) reveals a 1.5x1.5-cm high signal intensity lesion at the left globus pallidus and low signal intensity in the same area in T1W(Right)

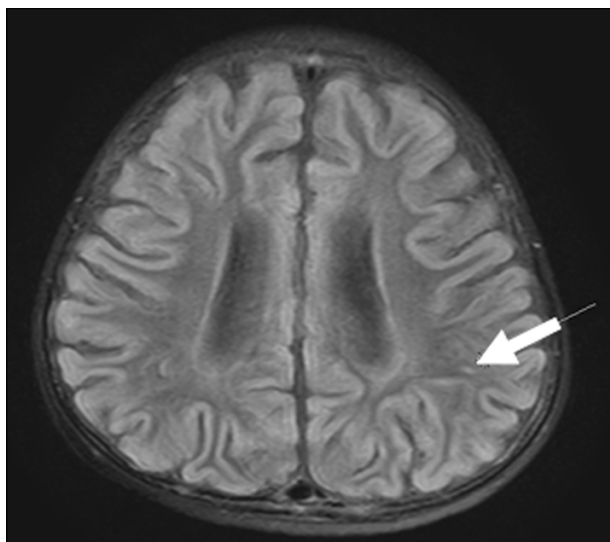


Figure 2 MRI brain T2W/flair shows small abnormal signal intensity foci deep white matter in the left temporal lobe.

Case 2

A 2-year-old boy, diagnosed with acute myeloid leukemia (AML) M5-subtype, presented acute fever and hyperleukocytosis. His initial white blood cell count was $360 \times 10^9/L$ (blast 100%), hemoglobin 8.5 g/dL, and platelet count $48 \times 10^9/L$. CSF cytology was negative for leukemic cell. AML treatment was started and he was in remission after induction-I. During the course of induction-II, he developed bilateral lower motor neuron facial palsy with bilateral lateral gaze palsy. MRI brain showed an abnormal signal intensity lesion at the intracanalicular segment of the right facial nerve, suggesting facial nerve involvement with leukemia (Figure 3). Treatment for this patient was continued with chemotherapy and triple intrathecal chemotherapy (methotrexate, cytarabine, and hydrocortisone) twice weekly. Subsequent cranio-spinal irradiation started after induction-II. He developed bone marrow relapse during radiation treatment and died of disease four months after initial diagnosis.

Patient's presentations, diagnoses and treatments are summarized in Table 1.

Discussion

We report two cases of facial palsy as the manifes-

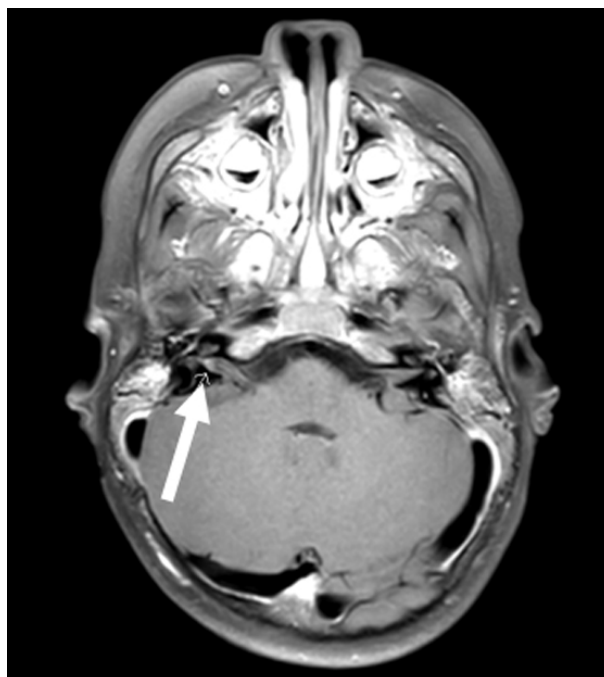


Figure 3 MRI brain T1W+C shows abnormal signal intensity lesion at intracanalicular segment segment of right facial nerve

tation of relapsed AML in children. Although ALL is more common among children, facial palsy is more associated with AML given the characteristic of myeloid cells, which tend to infiltrate in the CNS or accumulate as chloroma.⁶ According to one related study, CNS relapse in pediatric AML was related to younger age at diagnosis (< 2 year-old), high initial WBC count, marked hepatosplenomegaly, CNS involvement at diagnosis, FAB-M5 morphology and chromosome 11q abnormality.⁷ Case report 2 revealed multiple factors for CNS relapse while case report 1 presented no risk factor.

In childhood ALL, CNS involvement at diagnosis is associated with inferior outcomes and prognosis. CNS involvement in patients with ALL is constitutes a very high risk group and intensive treatment is required. Meanwhile, AML with CNS involvement does not constitute a high risk group. However, one related study reported the outcomes of patients with AML and CNS involvement confer very poor prognosis.⁸ CNS directed treatment including cranio-spinal irradiation might be indicated for patients with AML and CNS involvement.

Table1. Patients presentation, diagnosis and treatment

Case	1	2
Age at diagnosis (years)	10	2
Sex	F	M
Diagnosis	AML (M4)	AML (M5)
Clinical presentation(CNS)	Right facial palsy	Bilateral facial palsy
Diagnosis of CNS involvement	MRI brain	MRI brain
Site of involvement (imaging)	- Left globus pallidus - Right frontoparietal lobe - Deep white matter in left temporal lobe	- Intracranial segment of right facial nerve
CSF cytology at diagnosis	Negative	Negative
CSF cytology at the time of relapse	Positive	Negative
Treatment		
Systemic Chemotherapy	+	+
Intrathecal Chemotherapy	+	+
Cranial irradiation	-	+
Status	Died of disease 1 year after diagnosis	Died of disease 4 months after diagnosis
Neurological status after treatment	Improved	Partially improved

Despite the fact that MRI brain and/or CSF cytology are known to prove CNS involvement with leukemia, our report shows these investigations do not provide a definite diagnosis. Sequential examination is required and is beneficial to patients with supposed CNS leukemia. Steroid treatment among patients suspected of presenting Bell's palsy could provide partial remission but may lead to delay in diagnosis of CNS leukemia.

In conclusion, facial palsy is a rare manifestation of CNS leukemia among children with AML and is considered a dismal prognosis factor especially regarding relapse disease.

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