

Case Report



Concurrent bilateral juvenile temporal arteritis and hypereosinophilic syndrome: a case report and review of the literature

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Conflict of Interest

The authors have no financial conflicts of interest.

Author Contributions

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ABSTRACT

Most of temporal arteritis occurs in the older patient over 50 years old, and the histopathologic finding shows a granulomatous inflammation, so this called giant cell arteritis. However, the young patients also present with a nodular lesion in their temple, and juvenile temporal arteritis (JTA) should be considered as one of the differential diagnosis, although it is very rare. For both diagnosis and treatment of JTA, excisional biopsy is essential. The pathologic finding of the temporal artery shows panarteritis with lymphoeosinophilic infiltrates, but no giant cell or granulomatous lesion. JTA is a localized disease with low level of systemic inflammatory marker, so the symptom is usually relieved by excision of affected lesion. Peripheral blood eosinophilia present in some cases of JTA, but its relation with clinical course and prognosis is not yet been known. Herein, we report the case of a 24-year-old man diagnosed with concurrent JTA and hypereosinophilic syndrome. We also reviewed the literature of JTA focusing on the impact of combined peripheral eosinophilia on the course of the disease. Combined peripheral eosinophilia may increase the risk of recurrence of JTA after local treatment such as excision only.

Keywords: Temporal arteritis; Juvenile temporal arteritis; Eosinophilia; Hypereosinophilic syndrome

INTRODUCTION

Most of temporal arteritis is known as giant cell arteritis (GCA), which is a granulomatous vasculitis that occurs in older adults, mainly those over 50 years old [1]. Although it is rare, young patients under 40 years of age could also develop vasculitis in the temporal artery, and this requires some differential diagnosis [2]. The patient may have systemic vasculitis involving temporal artery, or the elderly type arteritis such as GCA, though it is rarely seen

in the young, or juvenile temporal arteritis (JTA), which is a eosinophilic arteritis that occurs only locally in the temporal artery [2, 3].

Since the first report of JTA in 1975 [4], a total of 22 cases have been reported so far [2-20], but its etiology, pathogenesis, and long-term prognosis are still unknown. Although JTA is a localized disease, it is often accompanied by peripheral blood eosinophilia, so some authors have suggested the concept of JTA with eosinophilia [8, 12, 13]. However, its association with pathogenesis, clinical features, and prognosis of JTA remains unclear. Herein, we report the case of a 24-year-old man with concurrent JTA and hypereosinophilic syndrome (HES), and present a review of the literature on JTA, specifically focusing on the association of combined peripheral blood eosinophilia and the course of JTA.

CASE REPORT

A 24-year-old Korean man presented with a painful nodular lesion on his left temple that worsened from a month ago. He had visited a primary care center, where blood tests revealed eosinophilia, and then referred to our hospital for further evaluation. He had a history of chronic rhinosinusitis, and had been using a fluticasone/salmeterol inhaler for 6 months as empirical treatment for cough and dyspnea. He denied taking any herbal medicines, raw foods, or other drugs that could increase eosinophil count.

A physical examination revealed that tender nodular lesions on both temples (the left side was worse) and the palpable lymph node (LN) on the right inguinal area. Laboratory findings included total leukocyte, eosinophil, and hemoglobin level of 20,900/mm³, 8250/ μ L, and 17.4 g/dL, respectively. The following tests were within normal ranges: serum electrolytes, creatinine, alanine aminotransferase, aspartate aminotransferase, prothrombin time, activated partial thromboplastin time, and C-reactive protein. The erythrocyte sedimentation rate (ESR) was slightly elevated (26 mm/hr; normal, 0–20 mm/hr). Total IgE (PRIST, Shin Jin Medics Inc., Ilsan, Korea) was 103 IU/mL (normal, <100 IU/mL), the level of eosinophil cationic protein was markedly elevated as > 200 μ g/L (normal, <18 μ g/L), and vitamin B12 was not increased (388 pg/mL; normal, 197–771 pg/mL). Antineutrophil cytoplasmic antibodies against proteinase 3 or myeloperoxidase and antinuclear antibodies were negative. Serologic test for common parasites (*Clonorchis sinensis*, *Paragonimus westermani*, *Cysticercus*, *Sparganum*, and *Toxocara canis*), hepatitis B, C, and human immunodeficiency virus were negative as well.

In the tests performed to diagnose asthma, the results showed 1.28 mg/mL for methacholine PC₂₀ and 64 ppb for a fractional exhaled nitric oxide, which were consistent with asthma. Computed tomography (CT) scan for chest and abdomen revealed that several LN enlargements at bilateral axillary areas, wedge-shaped nonenhancing portion at the spleen suggesting splenic infarction (**Fig. 1A**), and enlarged LN at right inguinal area (**Fig. 1B**). An echocardiogram showed no remarkable finding. A bone marrow biopsy showed eosinophilic hyperplasia but no evidence of myeloproliferative disease or chromosomal abnormality. The patient tested negative on PCR for BCR/ABL and FISH for FIP1L1/PDGFR α and FIP1L1/PDGFR β .

CT angiography and 3-dimensional-brain showed fusiform dilatation in the both superficial temporal arteries with wall thickening (**Fig. 1C**). The patient underwent excisional biopsy of bilateral superficial temporal arteries (**Fig. 2A**) and the right inguinal LN simultaneously.



Fig. 1. Computed tomography findings. (A) Wedge-shaped nonenhancing portion (arrow) at the spleen suggesting splenic infarct. (B) Enlarged lymph node (arrowhead) in the right inguinal region. (C) Fusiform dilatation in the both superficial temporal arteries (arrow) with wall thickening. R, right; L, left.

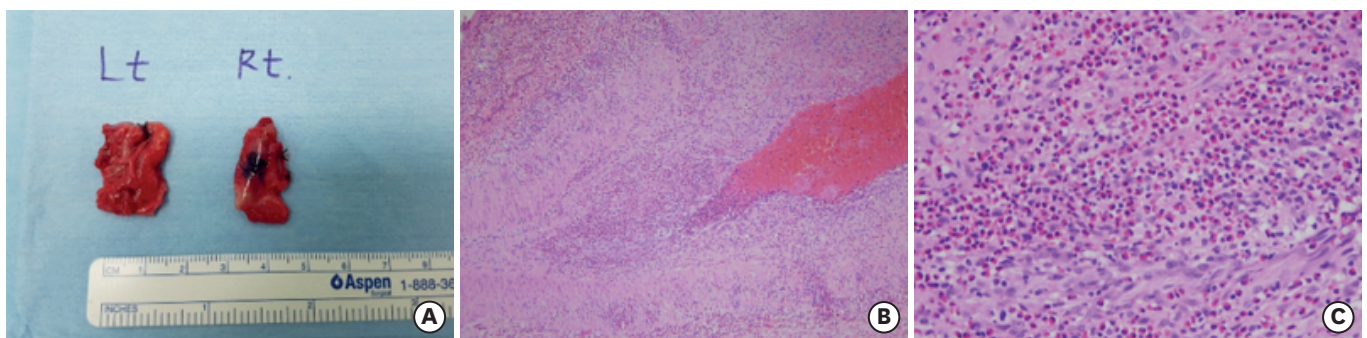


Fig. 2. Biopsy of the superficial temporal artery lesions. (A) The specimens of bilateral superficial temporal arteries after surgical excision. (B) The histopathological findings of the left superficial temporal artery showing marked eosinophilic infiltration in arterial wall and perivascular tissue, but not giant cells or granulomatous lesion (B: H&E, $\times 100$; C: $\times 400$).

The histopathological findings of the left superficial temporal artery revealed that marked eosinophilic infiltration in arterial wall and perivascular tissue with eosinophilic abscess, focal destruction of vascular wall, and organizing thrombi, but granuloma formation with multinucleated giant cells was not seen (Fig. 2B, C). The right inguinal LN showed reactive follicles and massive eosinophil infiltration, but no evidence of malignancy.

Based on these results, the diagnosis of concurrent JTA and HES was made. The patient underwent surgical excision of both superficial temporal arteries for his JTA, and administered systemic steroid (intravenous methylprednisolone 90 mg [1 mg/kg] per day) for HES. There was no recurrence of JTA after surgical excision during 2 years of follow-up, and he was well maintained without any symptoms due to eosinophilia with low-dose steroid (prednisone 10 mg/day).

DISCUSSION

If vasculitis of the temporal arteries develops in the young, physicians should consider the following diagnoses: (1) JTA, (2) systemic vasculitis including eosinophilic granulomatosis with polyangiitis (EGPA), thromboangiitis obliterans, and polyarteritis nodosa, involving the temporal artery, and (3) the elderly type vasculitis such as GCA, though it is rarely seen in young adults [2, 3, 21].

In our case, the pathologic findings of the temporal arteries showed panarteritis with eosinophilic infiltrates but no giant cell or granulomatous lesion was seen, so that we could

excluded GCA. Next, we considered the possibility of EGPA. Although he had asthma, chronic rhinosinusitis, and peripheral blood eosinophilia, the pathologic findings of both temporal arteries were not consistent with EGPA, because there was no prominent extravascular eosinophil infiltration, necrotizing vasculitis, or granuloma formation [22]. Therefore, for his temporal arteritis, we concluded that it was consistent with JTA.

However, he had other problems such as several LN enlargement, splenic infarct, and eosinophil count over 8,000/ μ L. We considered the following diagnosis: JTA with eosinophilia, JTA with Kimura disease, and concurrent JTA and HES. The pathologic finding of excised right inguinal LN showed massive eosinophil infiltration, and this could be due to both Kimura disease and HES [23, 24]. However, the eosinophil count was extremely high, and there was splenic infarct that suggested thrombosis, which is one of the organ involvements of hypereosinophilia [25], thus we concluded that it was more compatible with HES than Kimura disease. Finally, the diagnosis of concurrent JTA and HES was made.

In 1975, Lie et al. [4] first reported four cases of JTA in the young. These patients complained of painless nodules on their temple, and the pathologic findings revealed nongiant cell inflammation of temporal arteries [4]. From then on until February 2019, according to our literature review through PubMed and Scopus, 18 more cases have been reported [2, 3, 5-20]. Including the present case, a total of 23 cases of JTA were reported and their mean age was 27 years (range, 7 to 44 years) and there was the male predominance (18 men and 5 women). Only seven cases out of 23 cases involved both side of temples. Clinical manifestation of JTA is as following: age younger than 40 to 50 years, a palpable nodule or vessel engorgement in the temple (painful or painless), and a localized disease so that there is no systemic involvement of vasculitis and usually shows normal ESR [2-4]. Peripheral blood eosinophilia could be present [2].

The histopathologic findings include intima hyperplasia and disruption of internal elastic lamina, which could also present in GCA, and lymphoeosinophilic infiltrate and its perivascular extension, and endothelial hyperplasia, which usually present in JTA, not in GCA [2, 11, 14]. The most important difference from GCA is that multinucleated giant cells and granulomatous infiltrates are not observed in JTA [10, 14].

JTA is a localized disease so that excision is curative and steroid treatment is usually not required, and after excision, recurrence is known to be rare [2]. Of the 22 cases identified through literature search, the excision of affected temporal artery was done in 19 cases [2-7, 9-12, 14-19], and only one case reported that the symptoms persisted after resection [14]. Two of the 18 cases that resolved after excision recurred later on the opposite side [12, 18]. Of the 3 cases without excision, 2 were treated with steroid because of combined disease such as Kimura disease [20] or HES [12], and 1 was treated with tocopherol nicotinate [8], and these patients reported no recurrence.

Of the total 23 cases including our case, we found 10 cases of JTA combined with eosinophilia, and a summary of those cases presented in **Table 1**. Recurrence after excision only treatment was more frequent in the cases of JTA with eosinophilia than without eosinophilia (2 of 6 cases vs. 0 of 12 cases). That is, prognosis of JTA may be worse when present with eosinophilia. In addition, one of the recurred cases reported that eosinophil count was elevated at recurrence [18]. Although only a small number of cases were available for the trend of eosinophil count after excision [8, 13, 18, 19], eosinophilia may persist even if temporal arteritis improves without

Table 1. Summary of the cases of juvenile temporal arteritis with blood eosinophilia reported in the literature

Year/case No./Ref.	Age/sex	Ethnicity	Comorbidity	Symptom sites	Systemic symptoms	Eosinophil (/mm ³)	ESR (mm/hr)	Organ involvement of eosinophilia	Pathologic finding	Treatment	Course	Eosinophilia
1996/1 [8]	39/M	Japanese	Asthma	Painless nodule, bilateral	None	2,660	6	None	Obliteration of the vessel lumen. Disruption of IEL. Panarteritis with eosinophilic infiltration. No GC.	Tocopherol nicotinate	No recurrence for 2 years	Remained (15%–30%)
2004/2 [3]	31/M	N/A (published by Greek authors)	None	Painless nodule, left	None	562	3	None	Arteritis with eosinophilic infiltration. No GC.	Excision	No recurrence	N/A
2005/3 [11]	23/M	Japanese	None	Painless nodule, left	None	2,755	3	None	Marked intimal thickening with fibrosis. Eosinophilic infiltrates. Focal disruptions of the IEL. No GC.	Excision	No recurrence for 8 months	N/A
2006/4 [12]	25/M	Japanese	Asthma	Mild HA, left	Malaise	1,331	3	Initially none. Skin rash occurred with relapse.	Organizing thrombus. Destruction of the arterial wall. Marked eosinophil infiltrates.	Excision	Recurred on opposite side (right)	N/A
2009/5 [13]	28/M	Japanese	Previously diagnosed with HES	Painless nodule, right	None	690	N/A	Pruritic plaques. Mononeuritis multiplex on both legs.	Obliteration of the vessel lumen. Disruption of IEL. Arteritis with eosinophilic infiltration. No GC.	Steroid	No recurrence	Resolved (90/mm ³)
2011/6 [16]	24/F	Korean	None	Painless nodule, left	None	16%	24	None	Intimal thickening. Focal disruptions of the IEL, EEL. Many eosinophils. No GC.	Excision	No recurrence for 2 months	N/A
2016/7 [18]	39/M	N/A (published by Italian authors)	None	Painless nodule, right	None	1,200	5	None	Nongranulomatous panarteritis with eosinophilic infiltrate. Disrupted IEL. No GC.	Excision	Recurred on the right. Second excision and steroid.	Elevated when recurred. Resolved after steroid.
2017/8 [19]	39/M	Japanese	Systemic sclerosis	Painless nodule, left	None	2,520	10	None	Nongranulomatous panarteritis with lymphoeosinophilic infiltrates. No GC. Disruption of the IEL.	Excision	No recurrence	Remained
2018/9 [20]	37/M	Korean	None	Painless nodule, bilateral	None	15.4%	N/A	LN enlargement, which revealed as KD.	The hyperplastic endothelium. Disruption of the IEL. Eosinophilic infiltrates on the vessel wall. No GC.	Excision only left. Steroid followed by AZA.	The right side resolved after 5 months. No recurrence for 7 years	N/A
This case/10	24/M	Korean	Asthma, CRS	HA, bilateral	LUQ pain	8,250	26	Splenic infarct, LN enlargement	Marked eosinophilic infiltration in arterial wall and perivascular tissue. No GC.	Excision. Steroid due to HES.	No recurrence after 2 years.	Low dose steroids were required for eosinophil control.

ESR, erythrocyte sedimentation rate; N/A, not available; GC, giant cell; IEL, internal elastic lamina; EEL, external elastic lamina; HA, headache; LN, lymph node; KD, Kimura disease; AZA, azathioprine; CRS, chronic rhinosinusitis; LUQ, left upper quadrant; HES, hypereosinophilic syndrome.

systemic steroids, and may lead to recurrence because documented recurrences occurred only in the patients with JTA with eosinophilia who treated locally. According to very recent case series (n = 12) from France, 41.7% (5 of 12) had peripheral eosinophilia, and this figure was similar to our estimate of 43.4% (10 of 23). However, the relation between the presence of eosinophilia and the recurrence of JTA was not presented in that study [26].

In conclusion, when the young patient present with nodular lesion at temple, JTA is one of the differential diagnosis, and excisional biopsy is essential. JTA is a localized disease, and usually excision is enough for the symptom relief. However, if eosinophilia is present, physicians should be aware of the chance of its recurrence and systemic involvement of eosinophilic disease.

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