Tophaceous Gout in the Cervical Spine

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Abstract

A 58-year-old woman with a three-year progressive history of chronic arthritis, had become disabled due to general malaise and fever. Her laboratory data revealed hyperuricemia and elevated levels of C-reactive protein. Neither rheumatoid factor nor anti-citrullinated peptide antibodies were present. We diagnosed her with tophaceous gout with uric crystalline revealed by the arthrocentesis of the elbow. ^{99m}Tc scintigraphy also disclosed a significant uptake in the cervical spine. The CT of the patient's cervical spine revealed significant bone erosion and destruction. We diagnosed the cervical involvement of gout based on the exclusion of infections and sarcoidosis. Rheumatologists should be aware of this rare association.

Key words: cervical spine, hyperuricemia, tophaceous gout

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Introduction

Gout is a disorder of urate metabolism, a common clinical syndrome characterized by an intense inflammatory response to a deposition of monosodium urate crystals in joints and soft tissues. Gout is a common cause of inflammatory arthritis in men over forty, and it typically affects the distal joints in the appendicular skeleton. We present a woman with tophaceous gout in the cervical spine and provide a summary of this rare condition.

Case Report

A 58-year-old woman with a three-year progressive history of chronic arthritis affecting her bilateral shoulders, elbows, wrists, and finger joints, had become disabled due to general malaise and fever. She was admitted to our department in February 2011. Physical examination revealed severe arthritis in the above-mentioned joints, some tophi of the auricle, and dorsum of the hands and elbows. Her laboratory data on admission revealed hyperuricemia (9.4 mg/

dL; normal, <7.0 mg/dL), elevated levels of C-reactive protein (85.5 mg/L; normal, <3.0 mg/L), renal impairment with serum creatinine of 2.3 mg/dL, and blood urea nitrogen of 58 mg/dL. Neither rheumatoid factor nor anti-citrullinated peptide antibodies were present (Table 1). An abdominal computed tomography (CT) and sonography revealed atrophic kidneys. We made a diagnosis of tophaceous gout with uric crystalline, not calcium pyrophosphate by arthrocentesis of the elbow. ^{99m}Tc scintigraphy showed a significant uptake in the affected joints and cervical spine. A CT scan of the patient's cervical spine (C4-7) revealed significant bone erosion and destruction (Fig. 1). We could not biopsy the cervical lesions, but we were able to differentiate the lesions from tuberculous arthritis, pyogenic arthritis, sarcoidosis, and seronegative spondyloarthropathy based on blood cultures and other clinical data. We diagnosed that the cervical lesions were an involvement of gout. We took care of her renal dysfunction and started to treat with 30 mg/day of prednisolone. The initial dose was continued for two weeks, and reduced by 5 mg/week to 20 mg/day, and by 2.5 mg/week to less than 20 mg/day. Allopurinol was started at 50 mg/day, and increased to 100 mg/day after three weeks. We

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Table 1. Laboratory Data on Admission

CBC		Chemistry		Serology	
WBC	6700 /mm ³	TP	9.0 g/dL	CRP	85.5 mg/L
Neu	80.2 %	Alb	3.2 g/dL	RF	<5 IU/mL
Lym	10.4 %	T-Bil	0.2 mg/dL	CH50	41.4 U/mL
Mono	5.7 %	AST	47 IU/L	IgG	3229 mg/dL
Eos	3.4 %	ALT	36 IU/L	IgA	596 mg/dL
Baso	0.3 %	ALP	853 IU/L	IgM	118 mg/dL
RBC	2.52 x10 ⁶ /mm ³	γ-GTP	226 IU/L	ANA	(-)
Hb	6.9 g/dL	LDH	231 IU/L	a-SS-A	(-)
Ht	22.1 %	BUN	58 mg/dL	a-CCP	(-)
Plt	390 x10 ³ /mm ³	Cr	2.3 mg/dL	MPO-ANCA	(-)
ESR	97 mm/hr	UA	9.4 mg/dL		
Urinalysis		Na	136 mEq/L		
Protein	(-)	K	5.8 mEq/L		
Blood	(-)	Cl	105 mEq/L		
		Ca	9.5 mg/dL		

Gray letters indicate abnormal values.

PSL: prednisolone, APN: allopurinol, BBM: benzbromarone, CRP: C-reactive protein, UA: uric acid, Cr: creatinine

Figure 1. Tophaceous gout in the cervical spine of a 58-year-old woman. A computed tomography scan of the patient's cervical spine (C4-7) revealed significant bone erosion and destruction.

prescribed with 50 mg/day of benzbromarone. Her clinical symptoms and laboratory data improved. For the lesions, we prescribed a cervical collar. She was transferred to our hospital's department of rehabilitation in April 2011 (Fig. 2).

Discussion

Although gout is primarily considered to be a preferential male disease, women who are postmenopausal have an increased incidence (1). Compared with men, women are usually older than men at the age of onset, and the gout attack often presents as recurrent polyarthritis. Due to gender differences, the location of the recurrent polyarthritis attacks can widen during the disease period while men show a higher prevalence of podagra. In addition, involvement of other joints, such as the ankle, fingers and upper limbs is often apparent in female patients with gout (2). Gout usually

presents as acute inflammatory monoarthritis, typically affecting the great toe MTP joint. It is easy to diagnose with gout, but it is often difficult to diagnose tophaceous gout (3). It is known that poor control of hyperuricemia can lead to acute gouty arthritis; in the present patient's case, there was long-standing poorly controlled hyperuricemia (4). Recently, however, tophaceous gout has only appeared in 10% of the cases (2).

Tophaceous gout develops within 5 years of onset of gout in 30% of untreated patients (5). In the present patient's case, tophi appeared only three years preceding the onset. The factors that contribute to the formation of tophaceous gout have not yet been determined, however, clinical factors, such as the degree of hyperuricemia and renal dysfunction, the duration of the disease, age of onset, and the number of gouty attacks have all been considered. In addition, physiological and biochemical factors in the affected tissues, such

Figure 2. Clinical course of this patient. We took care of her renal dysfunction and started to treat her with 30 mg/day of prednisolone, allopurinol, and benzbromarone. Her clinical symptoms and laboratory data improved.

Table 2. Case Reports of Tophaceous Gout in the Cervical Spine

	Age /Sex	History of CG	Serum UA (mg/dL)	Renal dysfunction	Spinal levels involved	Treatment
1. Kersley GD ⁷⁾	1950 24 M	6 Y	13.3	(+)	C1-2	traction, collar
2. Vinstein AL ⁸⁾	1972 46 M	10 Y	13.2	N.D.	C3-4	pharmacological, cervical traction
3. Magid SK ⁹⁾	1981 50 F	N.D.	11.2	(+)	C1-2, Th2, 8-9	pharmacological
4. Sequeira W ¹⁰⁾	1981 61 M	N.D.	9.4	(+)	C3-4	laminectomy
5. Miller JD ¹¹⁾	1984 67 M	14 Y	11.8	N.D.	C5-6, 6-7	pharmacological
6. Jacobs SR ¹²⁾	1985 53 M	4 Y	18.6	(+)	C1-2, 5-6, 6-7	pharmacological, Philadelphia collar
7. Alarcon GS ¹³⁾	1987 62 M	15 Y	N.D.	N.D.	C6-7	pharmacological
8. Van de Laar MA ¹⁴⁾	1987 69 M	N.D.	8.4	N.D.	Occiput-C3	anterior removal of tophi, pharmacological
9. Sabharwal S ¹⁵⁾	1988 59 M	18 Y	11.3	N.D.	C5-7	pharmacological
10. Duprez TP ¹⁶⁾	1996 59 M	>1 Y	9.9	N.D.	C3-5	anterior corpectomies, foraminotomies, fusion
11. Yen HL ¹⁷⁾	2002 68 M	15 Y	12.1	(+)	C3-6	anterior microdiscectomies, interbody fusion
12. Diaz A ¹⁸⁾	2003 74 _	N.D.	N.D.	N.D.	C4-5	anterior decompression, fusion
13. Cabot J ¹⁹⁾	2005 76 F	N.D.	12.2	(+)	C4-7	pharmacological
14. Wazir NN ²⁰⁾	2005 66 F	>3 Y	7.3	(-)	C1-2	decompression, fusion
15. Fraser JF ²¹⁾	2007 71 M	30 Y	N.D.	N.D.	C2	pharmacological
16. Thavarajah D ²²⁾	2010 57 M	17 Y	N.D.	N.D.	Occiput-C2	fusion
17. Our case	2011 58 F	3 Y	9.4	(+)	C4-7	pharmacological, collar

CG: chronic gout, UA: uric acid, Y: year, N.D.: not described

as local temperature, blood flow, pH, concentration of proteoglycan and uric acid binding protein, and the activity of hyaluronidase may also be involved. In the reported cases to date many patients presented with high levels of uric acid and complications of renal dysfunction (Table 2).

Tophi can cause olecranon bursitis and are often observed on the auricle, the skin of the forearm, and around joints, especially MTP joints. Organs that are rarely involved include the tongue, vocal cords, and eyelids. Through the use of imaging modalities, tophi have reportedly been observed in the kidneys, trachea, cardiac valves, aorta, and vertebral

spine. Although an X-ray or CT scan is generally unnecessary for a typical diagnosis of gout, imaging scans are often required in atypical cases and are particularly useful in cases of gout that affect the spine. The initial changes in joints are similar to the marginal joint erosion seen in rheumatoid arthritis, but the findings are differentiated by no joint narrow space and subchondral osteoporosis. In cases where gout has progressed, the disease presents with a punched-out lesion and "overhang," in which periosteal stimulation reveals eave-like projections along with joint destruction (6). When lesions cannot be detected by X-ray, a CT scan can be ef-

fective.

In the present case gout-related cervical spine lesions were apparent. This is a rare condition; only 16 such cases have ever been reported. In the literature, most of these patients were males, but the condition has been found in postmenopausal woman, as in the present case. The diagnosis is often observed in cases of long-standing gout, with elevated levels of uric acid. Hyperuricemia often goes untreated for a long time, as in the case of our patient. The lesions can occur in any area of the cervical spine, but are most frequently seen in C4-7 (7-22). If severe neurological symptoms are present, orthopedic surgery is usually performed; otherwise a course of drug treatment is prescribed. It has been recently reported that an endoscopic biopsy can reveal uric crystals, but it is important to confirm the diagnosis through imaging.

More frequent health exams significantly reduce the prevalence of chronic tophaceous. However, rheumatologists should be aware of the possibility of cervical lesions from gout involvement in patients who present with neck pain, and subsequently verify the diagnosis by X-ray or CT scan.

The authors state that they have no Conflict of Interest (COI).

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