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CPPD crystal deposition disease of the cervical spine: A common cause of acute neck pain encountered in the neurology department

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ABSTRACT

Background: Calcium pyrophosphate dihydrate (CPPD) crystal deposition disease is one of the most common forms of crystal-associated arthropathy in the elderly. However, CPPD deposition on the cervical spine is less well known, and only a limited number of cases have been reported to date. Here, we report our recent clinical experience with CPPD crystal deposition disease of the cervical spine and describe the clinical features of this disease.
Methods: Fourteen patients with clinically diagnosed CPPD crystal deposition disease of the cervical spine at our department during the period from January 2005 to December 2008 were analyzed retrospectively.
Results: Patients ranged in age from 54 to 92 (mean ± SD, 77.5 ± 8.5). Chief symptoms of patients were acute posterior neck pain and fever. All patients had markedly restricted neck rotation. Serum CRP level was highly elevated in all patients (10.16 ± 5.35 mg/dL). Computed tomography of the cervical spine demonstrated linear calcific deposits in the transverse ligament of atlas (crowned dens syndrome) in all patients. Calcific deposits were also found in other periodontoid structures and the ligamenta flava in some patients. Posterior neck pain, fever, and increased serum inflammatory indicators were relieved within 1 to 3 weeks by nonsteroidal antiinflammatory drugs (NSAIDs) or a combination of NSAIDs and prednisolone. Most of the patients were misdiagnosed as having other diseases before consultation.
Conclusions: CPPD crystal deposition disease of the cervical spine is one of the most common underrecognized causes of acute neck pain in the neurology department, especially in elderly patients.

1. Introduction

The crystal-associated arthropathies form a group of metabolic diseases in which crystals, such as calcium pyrophosphate dihydrate (CPPD), basic calcium phosphate (*e.g.*, hydroxyapatite and octacalcium phosphate), and monosodium urate, are deposited in and around joints, leading to inflammatory and destructive lesions. Pseudogout is one of the most common forms of crystal-associated arthritis associated with CPPD deposition in the joints and periarticular tissues [1–3]. The prevalence of CPPD deposition is extremely high and it is reported that knee chondrocalcinosis, which is assumed to be due to CPPD deposition, is found in 9.6% of individuals older than 50 years old, and this incidence increases with age [4,5]. Attacks of pseudogout can be either monoarticular or oligoarticular, and the most commonly affected joints are the knees, followed by the shoulders, wrists, and ankles [2]. CPPD crystal deposition also induces arthritis mimicking rheumatoid arthritis (pseudorheumatoid arthritis) or osteoarthritis (pseudoosteoarthritis). However, CPPD crystal deposition on the cervical spine is less well known and only a limited number of cases of this condition have been reported to date [6–14].

Here, we report our recent clinical experience with 14 patients with CPPD crystal deposition disease of the cervical spine manifested by acute severe posterior neck pain. Acute neck pain is a common complaint among patients in the neurology department; however, it is sometimes difficult to make a precise diagnosis. Although a small number of patients have previously been reported, our recent clinical experience with 14 patients suggests that CPPD crystal deposition disease of the cervical spine is one of the most common underrecognized causes of acute neck pain.

2. Patients and methods

Data from 14 patients with clinically and radiologically diagnosed CPPD crystal deposition disease of the cervical spine at our department

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Table 1
Summary of patients with CPPD crystal deposition disease of the cervical spine.

Patient no.	Age	Sex	Inflammation markers			Calcifications in the cervical spine		Suspected diagnosis before consultation
			CRP	ESR	WBC	Periodontoid str.	Lig. flava	
1	83	F	18.02	n. e.	9620	+	+ (C3–7)	Occipital neuralgia
2	82	M	13.70	n. e.	7920	+	+ (Th1)	Tension-type headache
3	78	M	11.67	n. e.	11,500	+	+ (C4)	Subarachnoid hemorrhage
4	75	M	2.05	n. e.	9120	+	−	
5	92	F	12.31	97	9170	+	+ (C2–6)	Collagen disease
6	76	F	n. e.	n. e.	5600	+	−	
7	54	M	n. e.	n. e.	7300	+	−	
8	80	M	n. e.	n. e.	n. e	+	+ (Th1–2)	
9	78	F	15.96	87	8030	+	−	Polymyalgia rheumatica
10	71	M	11.00	n. e.	11,000	+	−	Cervical spondylosis
11	85	F	3.60	n. e.	6800	+	+ (C5)	
12	79	F	13.17	n. e.	7960	+	−	Meningitis
13	78	M	6.20	57	7970	+	−	Bacterial spondylodiscitis
14	74	F	4.03	80	9160	+	−	Epidural abscess
Mean	77.5		10.16	80.3	8550			
SD	8.5		5.35	20.8	1623			

CRP, serum C-reactive protein; ESR, erythrocyte sedimentation rate; WBC, white blood-cell count; Periodontoid str., Periodontoid structure; Lig. flava, Ligamentum flava; n. e., not examined.

during the period from January 2005 to December 2008 were analyzed retrospectively. The following data were collected from the medical records of the patients: gender; age; clinical course; inflammatory indicators, such as white blood-cell count (WBC), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) level; radiological findings; and outcome.

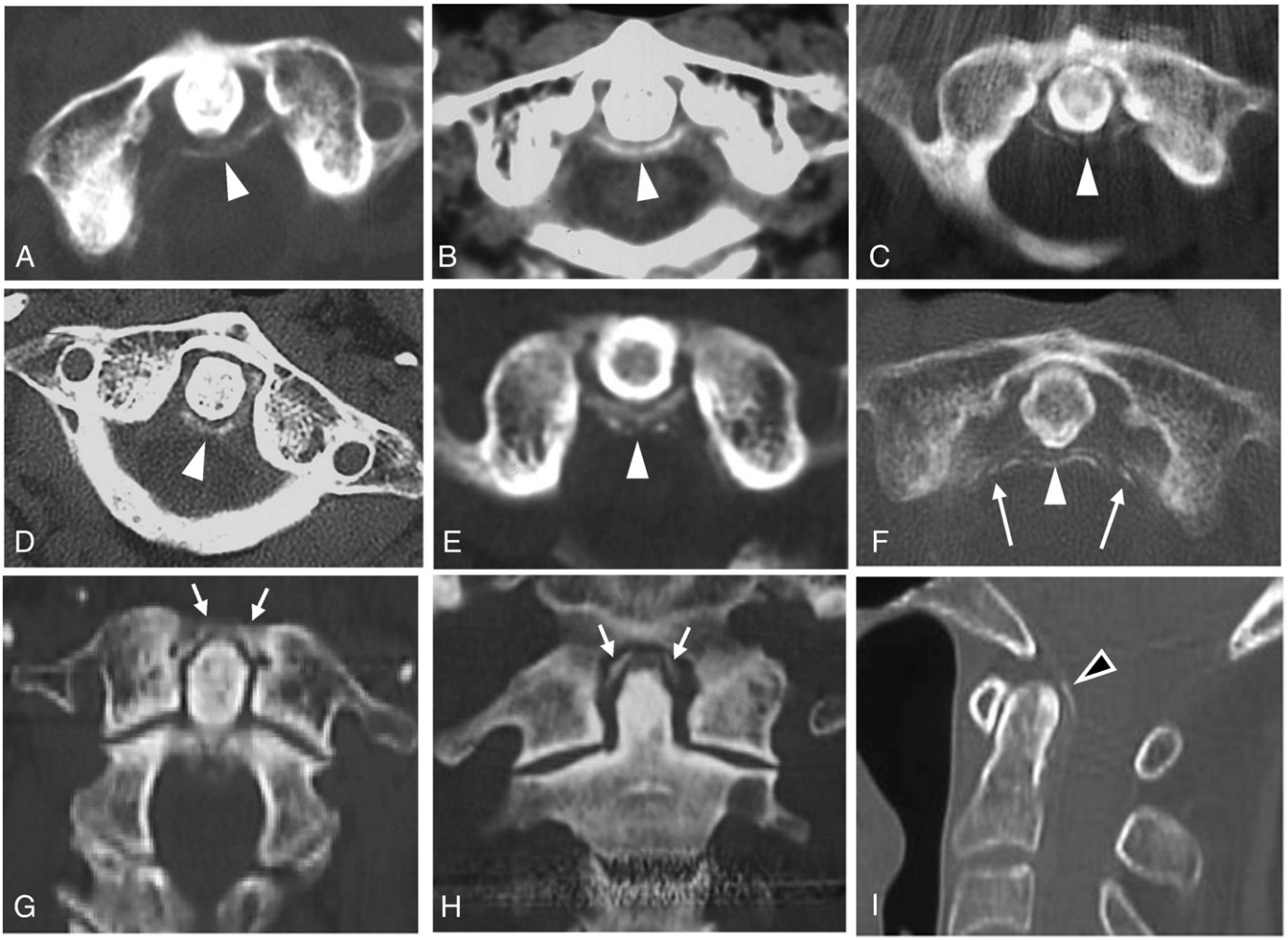

Fig. 1. Axial (A–F), coronal (G, H), and sagittal (I) views of the cervical CT scan at the C1/C2 level showed linear calcifications of the transverse ligament (A–F; arrowheads), alar ligament (F; long arrows), apical ligament (G, H; short arrows), and superior longitudinal fibres of the cruciate ligament (I; black arrowhead) suggesting CPPD deposition. (A) Patient 2. (B) Patient 4. (C) Patient 5. (D) Patient 7. (E) Patient 8. (F) Patient 11. (G) Patient 10. (H) Patient 13. (I) Patient 11.