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Original Article

Multiple calcifications within the parotid gland of patients with Sjögren's syndrome

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ABSTRACT

Purpose: The purpose of this study was to investigate computed tomography (CT) and clinical features relating to calcifications within the parotid gland of patients with Sjögren's syndrome (SS).
Methods: Data from 30 patients with SS who had been examined by CT were extracted from our radiological information database accumulated from 2001 to 2011, and their CT images were reread carefully. Of these patients, 14 (all female; age range 20–95 years; mean age 61.4 years) with calcifications within the parotid gland were retrospectively investigated with CT findings. The relationship between calcification occurrence and clinical symptoms including parotid swelling and/or saliva colic was investigated. The degree of destruction of the parotid gland on CT images was also evaluated.
Results: All calcifications of 14 patients were located within the parotid gland, not in the parotid duct. CT images of all calcifications showed small and regular round shapes. Multiple occurrences of calcifications were recognized in 10 patients, and a solitary occurrence was seen in 4 patients. Seven patients had bilateral calcifications. There was little relationship between the occurrence of calcifications and clinical symptoms, and the severity of destruction of the parotid gland.
Conclusion: The presented CT and clinical features would be peculiar to SS because too many patients lacked the typical features of sialoliths within the parotid gland.

1. Introduction

Sjögren's syndrome (SS) is a multi-system autoimmune disorder mainly targeting the salivary and lacrimal glands [1–4]. Clinical symptoms are characterized by progressive dry mouth and dry eyes [2–4]. In recent years, bilateral and multiple small calcifications in the parotid parenchyma have been reported as a new feature of SS [5–8]. The occurrence of small calcifications was considered to be in the severely destructed parotid parenchyma of SS [8] and to be extremely rare in the whole SS population [6,7]. To our knowledge, there had been less than 20 cases in the previous numerous studies of SS [5–8]. Therefore, characteristics of small calcifications were not sufficiently investigated.

Several imaging modalities, such as plain X-ray examination [8,9], sialography, ultrasound, and computed tomography (CT) [5,10], are available for detection of calcifications in the parotid gland. CT is the most useful tool in detection and evaluation of small calcifications because of its high spatial resolution [11,12]. CT can also depict the destructed parotid parenchyma, which was replaced by fat, due to autoimmune reactions of SS [8,13]. We planned a retrospective CT investigation to clarify some characteristics of small calcifications. The purpose of this study was to investigate CT and clinical features relating to calcifications within the parotid gland of patients with SS.

2. Patients and methods

We surveyed patients with SS, who had been examined by CT, from a radiological information database accumulated from 2001 to 2011. Data from 38 patients with SS were extracted. The purposes of CT examination were for diagnosis of inflammation, cysts, tumors, and trigeminal neuralgia. Patients had consented to CT examination and its study application. CT images were reread carefully to confirm the presence of calcifications in the parotid gland by three radiologists. Clinical information was simultaneously investigated from medical records and letters of introduction from previous doctors, in particular past examinations for definite diagnosis of SS, complications of other autoimmune diseases, a history of parotid swelling, and/or saliva colic. If clinical information was not enough, we interviewed the patients again if possible. All patients satisfied the revised Japanese diagnostic criteria for SS of 1999. Of

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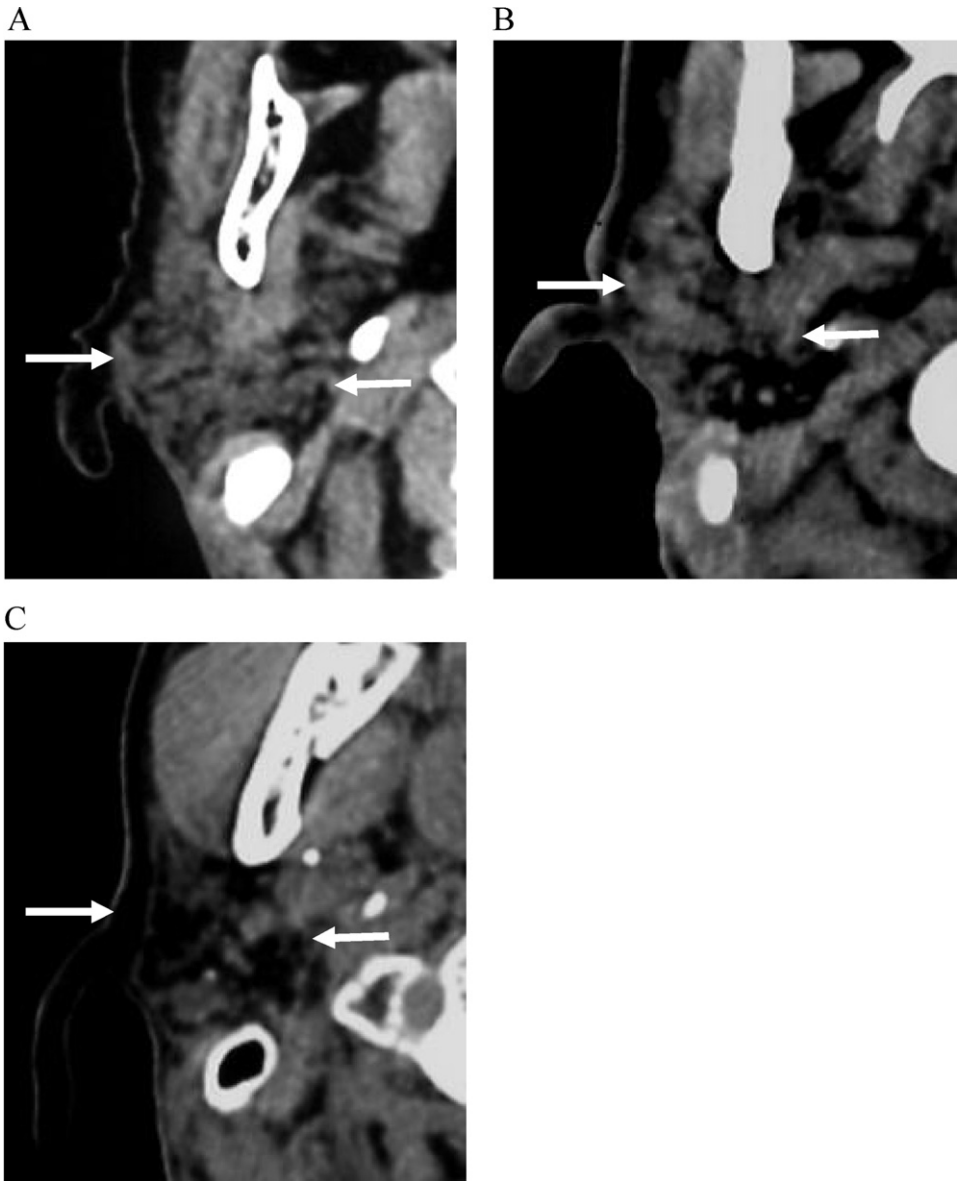

Fig. 1. The severity of destruction of the parotid gland parenchyma in patients with Sjögren's syndrome. (A) Slight destruction; Slight fat deposits are seen within the parotid gland, and most parenchyma remain. (B) Moderate destruction; Moderate fat deposits are seen within the parotid gland, and parenchyma remain to a degree between slight and severe. (C) Severe destruction; Severe fat deposits are seen within the parotid gland, and most parenchyma disappear.

38 patients, 8 patients were excluded because 5 had sialographic examination before CT examination and 3 patients had insufficient clinical information for this study. Of the remaining 30 patients, 14 (all female; age range 20–95 years; mean age 61.4 years) had calcifications in the parotid gland on CT images.

CT examination was performed with a single slice scanner (Somatom ART: Siemens Medical Systems, Erlangen, Germany), a 2-detector scanner (HiSpeed NX/I Pro: GE Yokogawa Medical Systems, Tokyo, Japan), or a 4-detector scanner (Asteion: Toshiba Medical Systems Corporation, Tokyo, Japan). Scan conditions were 120 kV and 100 mA. Transverse images with 3 mm or 2 mm thickness were continuously acquired with a scan direction parallel to the occlusal or mandibular plane.

CT images of 14 patients with calcifications were investigated for location, distribution, size, and shape of calcifications. The severity of the destructed parotid parenchyma on CT images was also evaluated based on a consensus of two experienced radiologists. We presumed the destructed parotid parenchyma, which results from autoimmune reactions of SS, from the extent of fat deposition in the parotid gland (Fig. 1). Whether these CT findings and clinical features had any characteristics in 14 patients were investigated.

3. Results

CT findings and clinical features of the 14 patients are summarized in Table 1. There were many characteristics differing from the typical features of sialoliths.

All calcifications of the 14 patients were located within the parotid gland, not in the parotid duct. CT images of all calcifications showed that the size did not exceed 2 mm and the shape was regular and round. Multiple occurrences of calcifications were observed in 10 patients, and bilateral occurrence was seen in 7 patients.

As to the relationship between the occurrence of calcifications and the severity of the destructed parotid parenchyma, slight destruction amounted to about 60%. There were a few patients with a history of parotid swelling and/or saliva colic (21%, 3/14) and with complications of other autoimmune diseases (14%, 2/14).