Case Report Prominent mucoid degeneration of the parotid gland in a patient with systemic lupus erythematosus

Mitsuaki Ishida¹, Muneo Iwai¹, Keiko Yoshida¹, Akiko Kagotani¹, Keiko Hodohara², Hidetoshi Okabe¹

¹Department of Clinical Laboratory Medicine and Division of Diagnostic Pathology, ²Department of Hematology, Shiga University of Medical Science, Shiga, Japan

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Abstract: Lupus erythematosus (LE) can cause various cutaneous lesions including panniculitis (LE profundus), but salivary gland involvement has been extremely rare in patients with LE. Herein, we report the first documented case of systemic LE with prominent mucoid degeneration and lymphoplasmacytic infiltration in the parotid gland. A 38-year-old Japanese male with histories of autoimmune hemolytic anemia and systemic LE presented with a swelling of the bilateral cervical region. A physical examination revealed a swelling of the bilateral parotid gland and erythema of the right cheek. A biopsy specimen of the cheek demonstrated LE profundus with mucoid material deposition in the dermis. A biopsy specimen of the parotid gland showed lymphoplasmacytic infiltration and prominent mucoid material deposition within the parotid gland as well as mild lymphoplasmacytic infiltration and hyaline fat necrosis in the perisalivary tissue. Mucoid material deposition is one of the characteristic features of LE, however, this is the first case demonstrating mucoid material deposition in the salivary gland. Moreover, albeit extremely rare, lymphoplasmacytic infiltration within the lobules of the salivary gland has also been reported in patients with LE. Therefore, it is important that both lymphoplasmacytic infiltration and mucoid material deposition must be included in the differential diagnostic considerations for salivary gland tumors in patients who had been previously diagnosed as systemic or discoid LE.

Keywords: Systemic lupus erythematosus, lupus erythematosus profundus, mucoid degeneration, parotid gland

Introduction

Lupus erythematosus (LE) is a complex autoimmune disorder showing a variety of cutaneous lesions. LE profundus, also referred to as lupus panniculitis, is an uncommon variant of panniculitis that is characterized histopathologically by lobular panniculitis with concomitant septal involvement and lymphoplasmacytic infiltration [1, 2]. In the dermis, superficial and deep perivascular lymphocytic infiltration was usually observed, and mucin deposition was also frequently noted [1]. LE profundus usually develops in association with systemic or discoid LE in approximately 1-3% of patients with both conditions, although it may also occur in the absence of either [3]. Sites of predilection include the face, head, arm, and trunk [1, 3], however, albeit extremely rare, salivary gland involvement has also been documented [4-7]. In this report, we describe the first documented case of prominent mucoid degeneration and

lymphoplasmacytic infiltration in the parotid gland in a patient with systemic LE.

Case report

A 38-year-old Japanese male presented with a swelling of the bilateral cervical regions. He had been diagnosed with autoimmune hemolytic anemia at the age of 20 years and with systemic LE at the age of 22 years. At the age of 29 years, he had been diagnosed with lupus nephritis (WHO IV + V). He had been treated with prednisolone.

A physical examination revealed a swelling of the bilateral parotid glands and erythema of the right cheek. Laboratory tests showed elevated anti-double strand DNA antibody (17.0 IU/mL; range <12) and anti-single strand DNA antibody levels (32.3 IU/mL; range <25). Anti-SS-A and anti-SS-B antibodies were negative. Biopsies from the right cheek and left parotid gland were performed.





Figure 1. Histopathological features of the cheek. A: Superficial and deep perivascular lymphocytic infiltration is observed. Mucoid material deposition is also noted in the dermis. HE, x 40. B: Mucoid material deposition in the dermis and around the sweat glands. HE, x 200. C: Mild lymphocytic infiltration, degeneration of adipocytes, and mucoid material deposition are noted in the subcutis. HE, x 200.

Skin biopsy

In the epidermis, no apoptotic keratinocytes were noted although mild vacuolar degeneration was observed in the epidermodermal junction. Perivascular lymphocytic infiltration was present in the entire dermis (**Figure 1A**). Moreover, mild lymphocytic infiltration was also observed within the hair follicles (**Figure 1A**). Mucoid material deposition was observed in the entire dermis and around the sweat glands (**Figure 1A, 1B**). Mild perivascular lymphocytic infiltration, degeneration of the adipocytes, and mucoid material deposition were noted in the subcutis (**Figure 1C**).

The mucoid material was positive for Alcian blue staining, and digested by hyaluronidase.

These histopathological features were typical for LE profundus.

Parotid gland biopsy

Lymphoplasmacytic infiltration and prominent mucoid material deposition were observed

within the parotid gland (Figure 2A). These lymphocytes were small in size and had round nuclei without nucleoli. Plasma cells were also bland in appearance (Figure 2B). Mild lymphoplasmacytic infiltration and hyaline fat necrosis were also noted in the perisalivary fatty tissue (Figure 2C). Moreover, phlebitis was present in the perisalivary tissue (Figure 2C, inset).

The mucoid material within the parotid gland was positive for Alcian blue staining (**Figure 2D**), and digested by hyaluronidase.

Immunohistochemical and *in situ* hybridization studies were performed using an autostainer (Ventana) by the same method as previously reported [8-12]. Many CD138-positive plasma cells were infiltrated, and CD3- and CD20positive lymphocytes were evenly distributed in the parotid gland (**Figure 3**). IgG4-positive plasma cells were rarely seen (1-2/10 high-power fields). Moreover, *in situ* hybridization demonstrated that *kappa* chain- and *lambda* chainpositive plasma cells were evenly infiltrated within the parotid gland. Moreover, CD3-,



Figure 2. Histopathological features of the parotid gland. A: Lymphoplasmacytic infiltration and mucoid material deposition are observed within the parotid gland, HE, x 100. B: Lymphocytes and plasma cells are without atypia and mucoid material deposition is noted within the parotid gland, HE, x 200. C: Mild lymphoplasmacytic infiltration and hyaline fat necrosis are observed in the perisalivary tissue. Phlebitis is also present (inset), HE, x 100, x 200 (inset). D: The mucoid material is Alcian blue-positive, x 100.

CD20-, and CD138-positive cells were also infiltrated within the perisalivary fatty tissue.

According to these features, an ultimate diagnosis of LE with prominent mucoid degeneration and lymphoplasmacytic infiltration in the parotid gland was made.

Discussion

In this report, we describe the first documented case of systemic LE with prominent mucoid degeneration and lymphoplasmacytic infiltration in the parotid gland. Salivary gland involvement of LE has been extremely rarely reported [4-7]. **Table 1** summarizes the clinicopathological features of the five previously reported cases of LE profundus with salivary gland involvement as well as the present case. This condition mainly affects females (male: female 2:4), and all cases had a history of discoid or

systemic LE. The present patient also had a history of autoimmune hemolytic anemia. The parotid or submandibular glands were affected. Most of the cases showed lymphocytic infiltration involving only the perisalivary fatty tissue [4, 5], however, White et al. reported a case of discoid LE with lymphoplasmacytic infiltration in the rim of lobules adjacent to perisalivary fatty tissue as well as lymphocytic infiltration and fibrosis in the perisalivary fatty tissue [4]. Moreover, we have previously described a case of systemic LE with prominent lymphoplasmacytic infiltration within the submandibular gland lobules with necrosis in addition to lymphocytic infiltration in the perisalivary fatty tissue [7]. In the present case, lymphoplasmacytic infiltration was present within the lobules of the parotid gland, and lymphocytic infiltration was also observed in the perisalivary fatty tissue. Perisalivary fatty tissue involvement was present in all three cases of LE with lymphoplasma-





Figure 3. Immunohistochemical features of the parotid gland. CD138-positive cells are predominant, however, CD3- and CD20-positive cells are also infiltrated, x 100.

Table 1.	Clinicopathological feature	s of lupus	erythematosus	profundus	involving the	salivary gland
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	Age/Sex	Associated disease	Location	Histopathological features	Salivary gland lobule involve- ment	Reference
Case 1	37/Female	DLE	Parotid gland	Only rim of the lobules adjacent to the fatty tissue had lymphoplasmacytic infiltration as well as lymphocytic infiltration and fibrosis in the perisalivary fatty tissue.	+	[4]
Case 2	74/Male	DLE	Parotid gland	Lymphocytic infiltration in the fatty tissue.	-	[4]
Case 3	29/Female	SLE	Submandibular gland	Lymphocytic infiltration and fibrosis in the perisalivary tissue.	-	[5]
Case 4	28/Female	SLE	Parotid gland	Not available	-	[6]
Case 5	38/Female	SLE	Submandibular gland	Prominent lymphoplasmacytic infiltration within the lobules of the salivary gland with necrosis. Lymphocytic infiltration in the perisalivary fatty tissue was also present.	+	[7]
Present Case	38/Male	SLE, AIHA	Parotid gland	Lymphoplasmacytic infiltration and mucoid material deposition within the salivary gland. Lymphoplasmacytic infiltration, fibrosis, hyaline fat necrosis, and phlebitis were also present in the perisalivary fatty tissue.	+	

AIHA, Autoimmune hemolytic anemia; DLE, Discoid lupus erythematosus; SLE, Systemic lupus erythematosus.

cytic infiltration within the lobules of the salivary gland [4, 7]. These cases including the present case indicate that LE panniculitis can occur in the salivary gland. A peculiar finding in the present case was the presence of prominent mucoid degeneration within the parotid gland. It has been well recognized that mucoid degeneration is one of the characteristic histopathological features of LE [1, 2]. Massone *et al.* analyzed the histopathological features of 11 samples from 9 patients with LE profundus [1]. In their series, 73% of the samples had mucoid material deposition in the dermis [1]. In the present case, mucoid material, which was Alcian blue-positive and digestible by hyaluronidase, was deposited both in the dermis and parotid gland. This phenomenon has not been described previously in the literature.

The present case had phlebitis and hyaline fat necrosis in the perisalivary fatty tissue. Vasculitis can be observed in LE profundus [1, 2], and in the case series reported by Massone *et al.*, vasculitis was observed in 9% of the cases [1]. Further, hyaline fat necrosis is also a characteristic feature of LE profundus [1, 2], thus 45% of the cases showed this feature [1].

Patients with LE sometimes present with salivary gland tumor, and most of them are usually associated with complicated Sjögren syndrome because patients with LE has an increased prevalence of Sjögren syndrome [13]. However, salivary gland involvement can occur solely in patients with LE in the form of lymphoplasmacytic infiltration in the perisalivary tissue and/or salivary gland lobules. Moreover, this case clearly demonstrates that mucoid material deposition can occur within the salivary gland in LE patients. Therefore, it is important that both lymphoplasmacytic infiltration and mucoid material deposition must be included in the differential diagnostic considerations for salivary gland tumors in patients who had been previously diagnosed as systemic or discoid LE.

Disclosure of conflict of interest

None.

Address correspondence to: Dr. Mitsuaki Ishida, Department of Clinical Laboratory Medicine and Division of Diagnostic Pathology, Shiga University of Medical Science, Tsukinowa-cho, Seta, Otsu, Shiga, 520-2192, Japan. Tel: +81-77-548-2603; Fax: +81-77-548-2407; E-mail: mitsuaki@belle.shiga-med. ac.jp

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