INTRODUCTION

Rosai-Dorfman disease, or sinus histiocytosis with massive lymphadenopathy, was first described as a distinct clinicopathological entity in 1969 (1). It primarily involves the lymph nodes. In 43% of the cases, extranodal sites are involved, simultaneously, and in only 23% does isolated extranodal Rosai-Dorfman disease occur. The extranodal sites include the skin, eyes and adnexae, paranasal sinuses, genitourinary system, CNS, bone, breast, soft tissues and thyroid (2). We describe a case of extranodal sinus histiocytosis in multiple sites.

Case Report

A 56-year-old man was presented with epigastric discomfort. A past history of left hemicolectomy, due to descending colon cancer was noted. Before the visit to our hospital, he had received an endoscopic examination, and adenocarcinoma at the antrum of the stomach was detected. Abdominopelvic CT was performed, and bilateral renal masses were identified. Both renal masses showed mild homogenous enhancement after IV contrast enhancement, and surrounded both renal pelves and both ureters. Diffuse paravertebral soft tissue attenuation masses were also identified along the thoracic vertebrae. The initial diagnosis was metastatic invasion of both renal pelves and both proximal ureters, as well as the paravertebral area of the thorax as a result of recurrent colon cancer (Fig. 1A-C).

The patient received chemotherapy for a duration of two years. Two years later, a follow-up CT scan was performed. Both renal parapelvic masses and the diffuse paravertebral soft tissue masses showed no remarkable interval change. A follow-up endoscopy and endoscopic biopsy was also performed, and
Adenocarcinoma at the gastric antrum also showed no interval change. The patient underwent subtotal gastrectomy and gastroduodenostomy. The histologic finding of the surgical specimen was early gastric cancer.

One year following the surgery, the patient was admitted to the hospital for the evaluation of swelling of the neck on both sides. Bilateral hard masses localized to the submandibular area were detected after a physical examination. A neck sonography was performed and bilateral enlarged submandibular glands of honeycomb shape were discovered (Fig. 1D, E). Sonography guided biopsy was performed, and the cytology revealed exuberant lymphoplasmacytic infiltration in both the submandibular glands.

Six days after the neck biopsy, the patient underwent a sonographically guided percutaneous biopsy of the left renal parapelvic mass. The pathologic specimen showed focal lymphphagocytosis and histiocytes that stained positive for S100 protein. No malignant cells were identified. Therefore, the histologic diagnosis of extranodal Rosai-Dorfman disease was made (Fig. 1F).

**DISCUSSION**

Rosai-Dorfman disease is a rare, idiopathic, non-neoplastic, lymphoproliferative disorder that has been known since 1969 when four cases were described (1). Typically, it is characterized by a bilateral cervical lymphadenopathy with fever, leukocytosis, increased erythrocyte sedimentation rate and hypergammaglobulinaemia. It is multifocal and multisystem condition in 43% of the cases. The extranodal sites include skin, soft tissues, respiratory system, genitourinary system, bones, CNS, orbit, thyroid and breast (2).

Histologically, it is characterized by a massive proliferation of the inflammatory cells, including histiocytes that can contain lymphocytes and hematopoietic cells within their cytoplasm.

---

**Fig. 1.** Imaging and pathologic findings of 56-year-old man with Rosai-Dorfman disease.

A, B. Axial contrast-enhanced CT scan reveals homogenous enhanced bilateral parapelvic masses (A) and soft tissue density encasing both ureters (arrows) (B).

C. Soft tissue attenuation density along the paravertebral area is also noted at the thoracic vertebra level (arrows).

D, E. Neck sonography demonstrates diffuse and enlarged right (D) and left (E) submandibular glands. Both submandibular glands show a honeycomb appearance.

F. Photomicroscopic image (S100 protein antibody staining, ×20) demonstrates S100 protein positive histiocytes (arrow).
These histiocytes are strongly positive for S100 protein in histochemical staining (3).

The disorder remains idiopathic and the clinical course varies widely from spontaneous remission to death from a vital organ infiltration. Patients with renal involvement have been associated with poorer outcomes, with 40% of patients dying of the disease, and the remainder having persistent involvement (2, 4).

Submandibular Rosai-Dorfman disease usually presents as a painless mass, similar to a neoplasm or cyst. Painful masses, on the other hand, may be the products of obstructive or inflammatory disease. Infiltration of the overlying skin, regional adenopathy, perineural spread, or bone invasion may indicate that a submandibular neoplasm is malignant. Rosai-Dorfman disease lacks these features (5).

With Rosai-Dorfman being a multiorgan disorder, the clinical manifestations vary and as well as the radiological manifestations, including the radiologic features, depending on the site of involvement. Plain film and CT imaging are extremely useful in detecting and characterizing the masses, but are not specific for Rosai-Dorfman disease with a wide differential diagnosis, including lymphoma, inflammatory and infectious processes (6). The appearance on CT is one of the homogenous masses, frequently with diffusely or locally enlarged lymph nodes (7). With extranodal disease, CT and MRI findings are also nonspecific, and typically reveal polygonal masses, mucosal thickening, or soft tissue opacification (8). CT of the abdomen yields lesions that are isodense to pancreatic tissue (9).

In our case, the exact first diagnosis is difficult because of patient’s colon cancer history and nonspecific radiologic features of Rosai-Dorfman disease. However, long term constancy of the appearance of the lesions should indicate other possibilities, such as Rosai-Dorfman disease.

Awareness of this disease will be especially useful in cases in which the percutaneous biopsy does not yield an alternative diagnosis. The use of special stains can then be suggested.

REFERENCES

1. Rosai J, Dorfman RF. Sinus histiocytosis with massive lymphadenopathy. A newly recognized benign clinico-pathological entity. Arch Pathol 1969;87:63-70
2. Foucar E, Rosai J, Dorfman R. Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease): review of the entity. Semin Diagn Pathol 1990;7:19-73
3. Rosai J, Dorfman RF. Sinus histiocytosis with massive lymphadenopathy: a pseudolymphomatous benign disorder. Analysis of 34 cases. Cancer 1972;30:1174-1188
4. Wright DH, Richards DB. Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease): report of a case with widespread nodal and extra nodal dissemination. Histopathology 1981;5:697-709
5. Yousem DM, Kraut MA, Chalian AA. Major salivary gland imaging. Radiology 2000;216:19-29
6. McClain KL, Natkunam Y, Swerdlow SH. Atypical cellular disorders. Hematology Am Soc Hematol Educ Program 2004:283-296
7. Sodhi KS, Suri S, Nijhawan R, Kang M, Gautam V. Rosai-Dorfman disease: unusual cause of diffuse and massive retroperitoneal lymphadenopathy. Br J Radiol 2005;78:845-847
8. Raslan OA, Schellingerhout D, Fuller GN, Ketonen LM. Rosai-Dorfman disease in neuroradiology: imaging findings in a series of 10 patients. AJR Am J Roentgenol 2011;196:W187-W193
9. Zivin SP, Atieh M, Mosier M, Paner GP, Aranha GV. Rosai-Dorfman disease (sinus histiocytosis with massive lymphadenopathy) of the pancreas: second case report. J Gastrointest Surg 2009;13:806-809
여러 부위에 발생한 림프절 외 Rosai-Dorfman Disease:
증례 보고

심종준1 · 김호균1 · 홍성우2 · 이혜경3 · 심재찬1 · 이경은1 · 이기재1 · 서정호1

Rosai-Dorfman disease는 비정상적인 조직구의 증식을 의미한다. 대개 림프절에서 발생하지만 간혹 림프절 외 부위에서
도 발생한다. Rosai-Dorfman disease 자체가 매우 드문 질환이며 림프절 외 침범은 더욱 드물게 나타난다. 저자들은 56
세 남자 환자의 여러 부위를 침범한 Rosai-Dorfman disease의 증례에 대해 보고하고자 한다. CT에서 양쪽 신장의 신우
와 양쪽 요관을 둘러싸는 연부조직 음영의 종괴가 보였으며 경부 초음파 검사에서 벌집 모양으로 커진 양쪽 하악선이 보
였다. 비록 Rosai-Dorfman disease가 드문 질환이지만 초음파나 CT에서 여러 부위를 침범하는 연부조직 양상의 종괴가
보일 때 그 가능성을 고려해야 한다.

인제대학교 의과대학 서울백병원 1영상의학과학교실, 2외과학교실, 3병리과학학교실