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Case Report

Castleman's disease of the left parotid gland: a case report

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Abstract: Castleman's disease is a very rare heterogeneous group of lymphoproliferative disorders characterized by non-neoplastic growths. It is unknown about the pathophysiology of the Castleman's disease. Previous studies demonstrated that Castleman's disease can be divided into two groups according to clinical classification, including unicentric Castleman disease (UCD) and multicentric Castleman disease (MCD). The hyaline vascular type is most common in the head and neck, and is abbreviated as UCD. In the present case, a woman complained that a mass in her parotid gland was growing and it was painless seven months ago. The computed tomography (CT) showed that the superficial lobe of the parotid gland on the left had an elliptical soft tissue density shadow, about 2.5×3.5 cm, with clear boundaries and no obvious abnormalities in the surrounding bone. The CT scan showed no obvious abnormalities in the shape and density of the right parotid and bilateral submandibular glands. After the operation, combined with the results of immunohistochemistry, the final diagnosis was Castleman tumor. The patient recovered smoothly, after the operation and during follow-up. The patient maintained good health without recurrence or metastasis.

Keywords: Castleman disease, parotid gland, unicentric Castleman disease, hyaline vascular type

Introduction

Castleman disease was first reported by Benjamin Castleman in a male's mediastinal mass in 1956 [1]. Castleman disease is a rare heterogeneous group of lymphoproliferative disorders which can be divided into two groups according to clinical classification, unicentric Castleman disease (UCD) and multicentric Castleman disease (MCD) [2, 3]. Unicentric disease occurs in the mediastinum with few patients complaining of constitutional symptoms such as fever, or dyspnoea. Multicentric diseases manifests as a systemic disease with peripheral lymphadenopathy [4]. According to histopathological characteristics, Castleman disease can be divided into the hyaline vascular type, the plasma cell type, and the mixed type [5]. In the head and neck, 98% of these lesions are of the hyaline-vascular type [6]. Talat et al. [7] analyzed 384 Castleman disease patients, of which 92.4% of the hyaline vascular type showed UCD. Castleman disease is in a group of very heterogeneous diseases, but its exact etiology and pathogenesis remain unknown. Computed tomography (CT) can help make the diagnosis of a tumor and assess the possibility of surgery. The definite diagnosis requires histopathologic and immunohistochemical analysis. We presented a 20-year-old female with unicentric Castleman disease who showed no lymphadenopathy on either side of the neck, submandibular and submental area.

Case report

A 20-year-old woman came to our hospital. About seven months ago, the patient found a painless mass in her left ear. She went to the People's Hospital of Liuhe District, Nanjing City in November 2019. She did not receive special treatment during pregnancy. Since the discovery of the lump, it has gradually increased from about "peanut"-like size to "egg yolk"-like size.

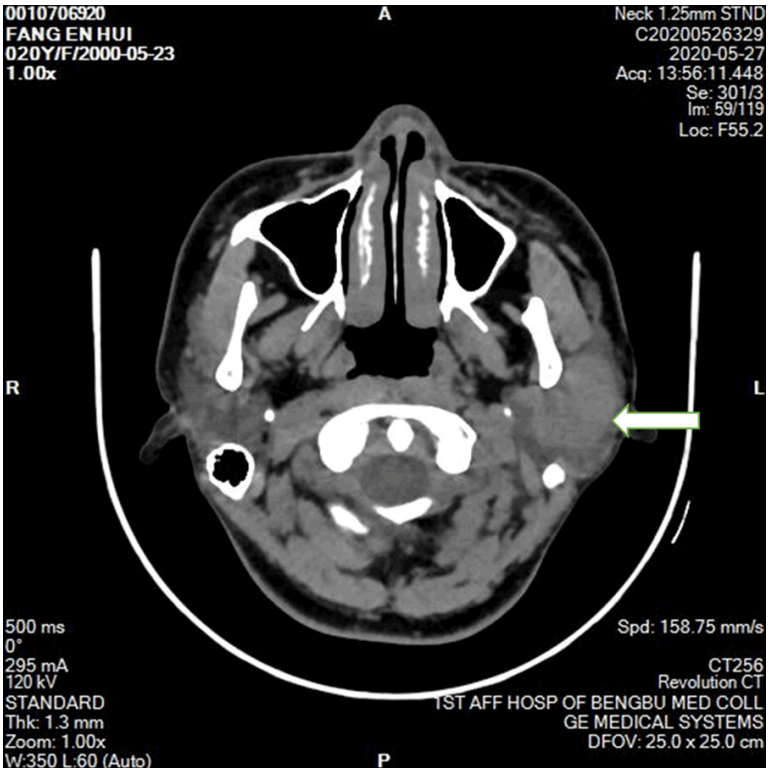

Figure 1. CT showed that a round isodensity mass could be seen in the left parotid gland, with clear boundary and uniform density.

However, the patient had no history of weight loss, dyspnea, or fever since her illness. She denied chronic diseases such as heart disease, hypertension, diabetes, and a history of infectious diseases such as hepatitis B and tuberculosis.

The dental specialist examination revealed that at the patient's face was asymmetrical, and a 1.9×3.9×2 cm mass was palpable under the left ear. The mass was flexible, no tenderness, clear boundaries, no adhesion to surrounding tissues, and could move well. Bilateral temporomandibular joints moved freely, no redness, swelling, no depression, and no deformity in the joint area. The bilateral neck, submandibular, and submental lymph nodes were not palpable. There was no swelling of the tonsils on either side, and no hyperemia in the pharynx.

Computed tomography (CT) showed that the shape of the neck was normal, the soft tissues of the neck were normal, and there were no clear enlarged lymph nodes. The elliptical soft tissue density shadow could be seen in the superficial lobe of the left parotid gland, about 2.5×3.5 cm, with clear boundaries and no obvious abnormalities in the surrounding bone. The morphology and density of the right parotid gland and bilateral submandibular glands had no obvious abnormalities (**Figure 1**). Histologic analysis after surgical mass resection, lymphatic sinuses disappeared under H&E microscopy, lymphoid follicles were hyperplasia in varying degrees (**Figure 2A**), and hyalinized small blood vessels penetrated the germinal center in some follicles. A typical "lollipop-like" structure was found in the picture (**Figure 2B**). Small lymphocytes were arranged in concentric circles around the germinal center, such as the "onion skin" image (**Figure 2C**). IHC showed that CD21, CD10, Bcl-6, CD20, CD43, Ki-67, and CD31 were positive. CD138 and CD30 were only positive for a few cells. However, TdT was negative by IHC (**Figure 2D**). Combined with the structural characteristics of H&E and the comprehensive analysis of immunohistochemical results (**Figure 2**), the final diagnosis was Castleman tumor, hyaline-vascular type. After the operation, the patient recovered smoothly and was discharged on the 15th day after the operation. At the time of discharge, the patient's vital signs were stable, eating and sleeping conditions were good, and there was no special discomfort. In the 12 months follow-up, the patient maintained good health without recurrence or metastasis.

Discussion

Castleman disease was first reported by Benjamin Castleman et al. in a male's mediastinal mass in 1956 [1]. Castleman's disease can be divided into unicentric Castleman disease (UCD) and multicentric Castleman disease (MCD), which is an uncommon, poorly understood lymphoproliferative disease [2, 3]. The hyaline vascular has often been associated

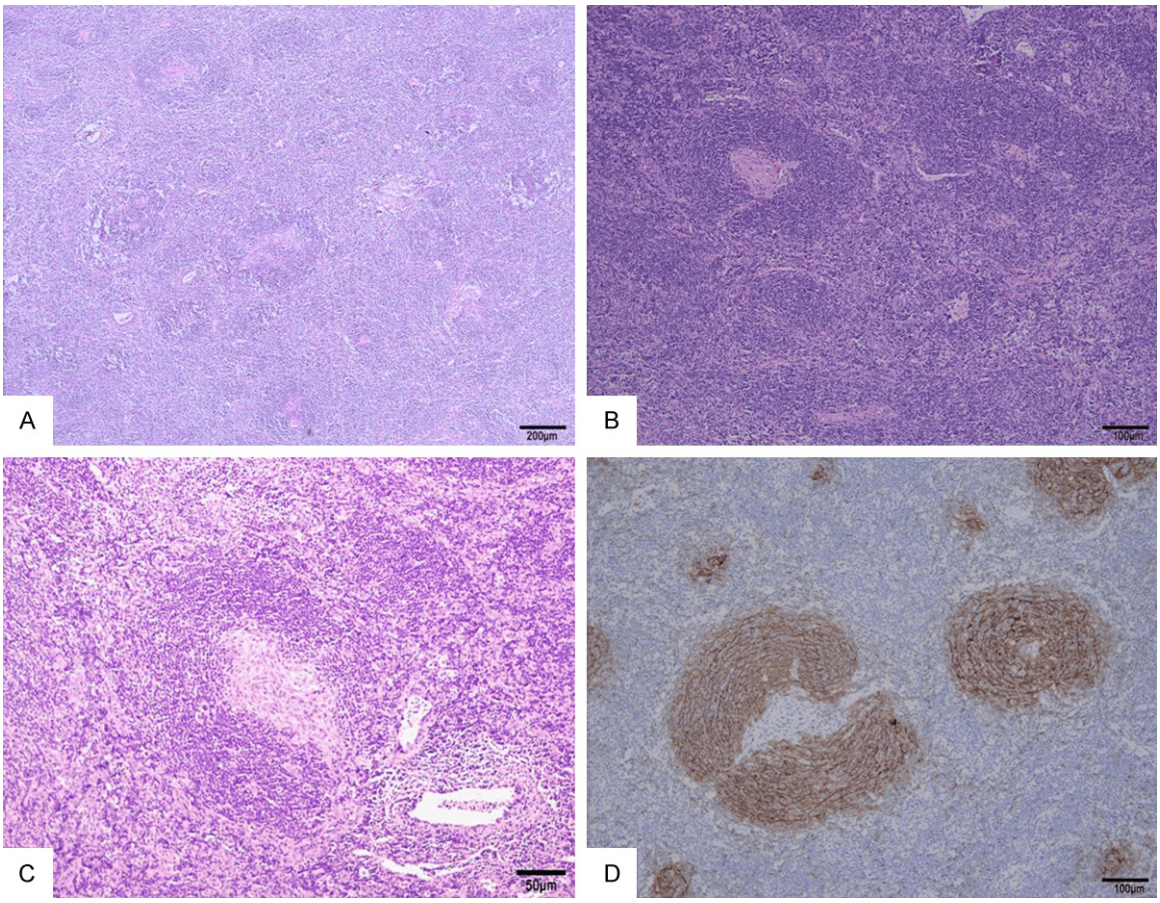

Figure 2. Histological features of Castleman's disease in the left parotid gland (Hematoxylin-eosin staining). A. Hyperplasia of lymphoid tissue and follicles (magnification ×40). B. Transparent hyaline degeneration between follicles, with human follicles interspersed with blood vessels, as seen in the "lollipop"-like image (magnification ×100). C. The small lymphocytes surrounding the follicles are arranged in concentric circles around the germinal center, as seen in the "onion skin"-like image (magnification ×200). D. CD21 positive proliferative lymphoid follicles (magnification ×100).

with the UCD while the plasma cell types have been related to MCD presentations in general [8]. Detailed pathophysiology remains unknown, although IL-6 is suspected to play an important role in proliferative disorders in general [9, 10]. Castleman disease clinically belongs to the category of uncommon benign lymphoproliferative disorders. The incidence and prevalence of Castleman disease has become difficult to evaluate. However, its effect occurs at similar rates in men and women. Castleman disease can occur in any lymph node in the body. However, the etiology and pathogenesis are not yet fully understood.

The clinical manifestations and prognosis of UCD and MCD are usually different. Patients with UCD are usually asymptomatic and show no abnormal laboratory findings, but patients with MCD may present with multiple findings, such as fatigue, weight loss, fever, sweat, and arthralgia [11]. Cases among UCD are often diagnosed by chance. Patients usually have a good prognosis and are treated with surgical excision [12]. Some patients withMCD may face an unfavorable prognosis. Many of these patients may eventually develop lymphomas [13-15]. Considering the differences in treatment and prognosis, it is increasingly important for doctors to distinguish between UCD and MCD. In previous reports, 98% of patients suffering from UCD in the head and neck appeared to be of the hyaline-vascular type [16]. In the present case, the patient was described as a unicentric Castleman disease with a parotid tumor, showing a benign local-

ized lump. The present case showed no clinical signs and the operation was highly successful.

In histology, Castleman disease can be divided into 3 types, hyaline vascular type, plasma cell type, and mixed type [17]. The present case was diagnosed as a hyaline vascular, unicentric Castleman disease patient. CT is an important auxiliary detection method, but the clear diagnosis of UCD is only based on histological and immunohistochemical findings after resection [18]. In the case of this study, the patient's H&E stained picture showed that the lymphoid follicles were surrounded by concentric layering of lymphocytes, with an onion skin appearance. These were the specific clinical features of the patient with hyaline vascular unicentric Castleman disease [19, 20].

In conclusion, this case showed that the surgery worked well for the woman with hyaline vascular type in UCD. According to reports, the hyaline vascular type in UCD has a good prognosis after surgical resection, and recurrence is rare [21, 22]. Multicentric CD has a poor prognosis, requires active treatment, and requires long-term follow-up [23, 24]. However, the pathogenesis of CD remains unclear. Some researchers put forward the view that the disease is an immune response, such as reactive lymph node hyperplasia theory. Other researchers believe that the disease originates from benign tumors or hamartomas [25-27].

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A statement of approval from the ethics committee and an informed consent from the patient have been obtained for publication of this case report and any accompanying images.

Disclosure of conflict of interest

None.

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References

[1] Castleman B, Iverson L and Menendez VP. Localized mediastinal lymph node hyperplasia resembling thymoma. Cancer 1956; 9: 822-30.

[2] Frizzera G, Banks PM, Massarelli G and Rosai J. A systemic lymphoproliferative disorder with morphologic features of Castleman's disease. Pathological findings in 15 patients. Am J Surg Pathol 1983; 7: 211-231.

[3] Weisenburger DD, Nathwani BN, Winberg CD and Rappaport H. Multicentric angiofollicular lymph node hyperplasia: a clinicopathologic-study of 16 cases. Hum Pathol 1985; 16: 162-172.

[4] Pasha H, Siddiqui MI and Wasif M. Castleman disease of the neck: a case report. J Pak Med Assoc 2020; 70: 354-356.

[5] Keller AR, Hochholzer L and Castleman B. Hyaline-vascular andplasma-cell types of giant lymph node hyperplasia of the mediastinum and other locations. Cancer 1972; 29: 670-683.

[6] Samadi DS, Hockstein NG and Tom LW. Pediatric intraparotid Castleman's disease. Ann Otol Rhinol Laryngol 2003; 112: 813-6.

[7] Talat N and Schulte KM. Castleman's disease: systematic analysis of 416 patients from the literature. Oncologist 2011; 16: 1316-1324.

[8] Haap M, Wiefels J, Horger M, Hoyer A and Müssig K. Clinical, laboratory and imaging findings in Castleman's disease - the subtype decides. Blood Rev 2018; 32: 225-234.

[9] Leger-Ravet MB, Peuchmaur M, Devergne O, Audouin J, Raphael M, Van Damme J, Galanaud P, Diebold J and Emilie D. Interleukin-6 gene expression in Castleman's disease. Blood 1991; 78: 2923-30.

[10] Ohtaka M, Kawahara T, Ishiguro Y, Sharma M, Yao M, Miyamoto H and Uemura H. Expression of receptor activator of nuclear factor kappa B ligand in bladder cancer. Int J Urol 2018; 25: 901-2.

[11] Shahidi H, Myers JL and Kvale PA. Castleman's disease. Mayo Clin Proc 1995; 70: 969-977.

[12] Bucher P, Chassot G, Zufferey G, Ris F, Huber O and Morel P. Surgical management of abdominal and retroperitoneal Castleman's disease. World J Surg Oncol 2005; 3: 33.

[13] Franco V. Report of a case of localized Castleman's disease with progression to malignant lymphoma. Am J Clin Pathol 1993; 100: 707-708.

[14] Park J, Lee JE, Kim M, Lim J, Kim Y, Han K, Park G, Jung YH, Roh SY and Hong YS. Discordant lymphocyte-depleted classical Hodgkin's and peripheral T-cell lymphoma arising in a patient 11 years after diagnosis of multicentric Castleman's disease. Int J Hematol 2013; 98: 114-121.

[15] Rao S, Ramesh A, Rajkumar A, Arcot R and Kuruvilla S. Persistent or recurrent Castleman's

disease - look out for a lurking lymphoma! Indian J Med Paediatr Oncol 2011; 32: 162-164.
[16] Samadi DS, Hockstein NG and Tom LW. Pediatric intraparotid Castleman's disease. Ann Otol Rhinol Laryngol 2003; 112: 813-6.
[17] Xiao-Dong L, Qiu-Xu W and Wei-Xian L. Castleman disease of the parotid gland: a case report. J Oral Maxillofac Surg 2020; 78: 400.e1-400.e6.
[18] Arlet JB, Hermine O, Darnige L, Ostland V, Westerman M, Badoual C, Pouchot J and Capron L. Iron-deficiency anemia in Castleman disease: implication of the interleukin 6/hepcidin pathway. Pediatrics 2010; 126: e1608-e1612.
[19] Wu PS. Mesenteric Castleman's disease: report of a case and literature review. Int J Clin Exp Pathol 2020; 13: 2397-2400.
[20] Jiang ZJ, Feng S, Liu G, Chen M and Sun JJ. Castleman's disease combined with choledocholithiasis: a case report and review of literature. Int J Clin Exp Pathol 2018; 11: 5491-5496.
[21] Wang W and Medeiros LJ. Castleman disease. Surg Pathol Clin 2019; 12: 849-863.
[22] Wojtyś M, Piekarska A, Kunc M, Ptaszyński K, Biernat W, Zaucha JM, Waloszczyk P, Lisowski P, Kubisa B and Grodzki T. Clinicopathological comparison and therapeutic approach to Castleman disease-a case-based review. J Thorac Dis 2019; 11: 4859-4874.
[23] Gürbüzler L, Ceylan A, Yilmaz M and Vural C. Castleman's disease of the parotid gland: a case report. Kaohsiung J Med Sci 2010; 26: 444-7.
[24] Boutboul D, Fadlallah J, Chawki S, Fieschi C, Malphettes M, Dossier A, Gérard L, Mordant P, Meignin V, Oksenhendler E and Galicier L. Treatment and outcome of unicentric Castleman disease: a retrospective analysis of 71 cases. Br J Haematol 2019; 186: 269-273.
[25] Sanchez-Cuellar A, de Pedro M, Martin-Granizo R and Berguer A. Castleman disease (giant lymph node hyperplasia) in the maxillofacial region: a report of 3 cases. J Oral Maxillofac Surg 2001; 59: 228-31.
[26] Choi G, Lee U, Kim A and Choi JO. Castleman's disease of the parotid gland. J Otolaryngol 1997; 26: 319-21.
[27] Anand VK and House JR 3rd. Isolated Castleman's disease in the neck. Ear Nose Throat J 1989; 68: 864-8.