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Case Report

Clinicopathologic characteristics of low-grade thyroid-like nasopharyngeal papillary adenocarcinoma: a case report

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Abstract: Low-grade thyroid-like nasopharyngeal papillary adenocarcinoma is a rare malignant tumor characterized by morphologic analogy to papillary thyroid carcinoma and aberrant thyroid transcription factor-1 (TTF-1) expression. To date, a limited number of cases have been reported in the literature. We report a case of a 20-year-old Chinese male patient with complaints of headaches and nosebleeds for 5 months. The histopathologic examination showed thyroid-like low-grade nasopharyngeal papillary adenocarcinoma that was confirmed by immunohistochemical staining. The patient was treated with macroscopic complete resection without adjuvant therapy. The epidemiologic characteristics and clinical and pathologic features of the disease are summarized. In addition, we summarize the treatments used previously. In general, TL-LGNPPA is a very rare low-grade adenocarcinoma with aberrant expression of TTF-1, and its diagnosis depends on morphology and immunophenotype. The prognosis is good.

Keywords: Low-grade thyroid-like nasopharyngeal papillary adenocarcinoma, therapy, clinicopathologic characteristics, surgery

Introduction

Low-grade nasopharyngeal papillary adenocarcinoma (LGNPPA) is a very rare low-grade malignant tumor observed in the nasopharynx. The tumor is similar to papillary thyroid carcinoma (PTC) and is characterized by expression of thyroid transcription factor-1 (TTF-1) [1]. In addition, LGNPPAs have indolent clinical behavior and low-grade histological features. Most patients with LGNPPA can be cured by complete surgical resection. Here, we report a case of a 20-year-old Chinese man with primary LGNPPA, and the pathologic features, clinical treatment, key diagnostic features, and prognosis of this disease are summarized.

Case report

A 20-year-old male patient was admitted to a local hospital due to headaches and nosebleeds for 5 months but had no ear stuffiness, dizziness, or rotation of vision. The patient underwent a nasopharyngoscopic examination that reported the presence of new organisms in the nasopharynx. MRI examination of the nasopharynx showed that the posterior wall of the nasopharynx had a nodular soft tissue signal shadow, was irregular in shape and lobulated, and had a size of about 2.1 × 2.1 × 1.4 cm^3; the MRI-enhanced scan lesions were significantly unevenly enhanced. On July 21, 2021, the neoplasm was removed using nasopharyngoscopy, and the base of the nasopharynx was electrocoagulated for hemostasis. During the surgery, neoplasms in the nasopharynx protruded into the posterior nostrils. The size was about 2.0 × 2.0 × 2.0 cm^3. Postoperative pathology of the nasopharynx showed epithelial or epithelial-myoepithelial tumors with papillary growth. Immunohistochemical analysis showed that the tumor cells were positive for EMA, TTF1, pan-

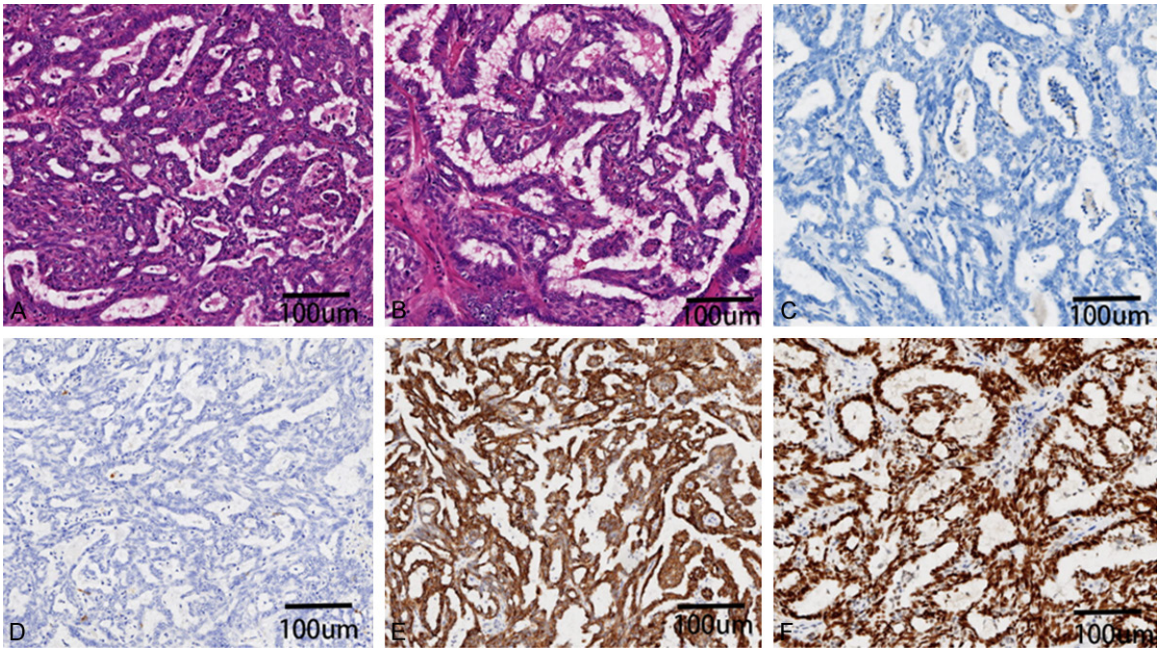

Figure 1. Immunohistochemistry of the neoplasm. Tumor consists of papillary structures and lined by bland columnar epithelium with elongated nuclei, tubular glands, and spindle cell regions (A, B) (H&E staining × 100). Immunophenotype for TL-LGNPPA showed both tumor cell types were negative for thyroglobulin and S-100 protein (C and D). The tumor cells were positive for CK-7 and TTF-1 (E and F).

CK, and CK7, focally or partially positive for CEA and CD117, and negative for thyroglobulin, S-100, and GFAP; and the Ki-67 index was about 15%. Using the immunophenotype and histologic morphology, a diagnosis of low-grade nasopharyngeal papillary adenocarcinoma with papillary growth was made. The patient was admitted to the radiotherapy department of our hospital on October 9, 2021. Upon pathologic consultation, the tumor cell immunophenotype was identified as CK7 (+), CK19 (+), CK5/6 (-), Napsin A (-), TTF-1 (+), Thyroglobulin (TG) (-), S-100 protein (individually +), Ki67 (about 10%), and EGFR (+) (**Figure 1**). Pathological diagnosis, using the tumor cell morphology and immunophenotype, was low-grade papillary adenocarcinoma.

In the Sichuan cancer hospital, a multi-disciplinary team of physicians reviewed the case postoperatively and concluded that the patient had nasopharyngeal papillary adenocarcinoma. The incidence of low-grade papillary adenocarcinoma is rare. The patient had undergone local tumor resection at his local hospital but we do not know whether any tumor cells got left behind. Nasopharyngoscopy was performed at our hospital. A small nodule of about 0.3 cm was observed near the posterior end of the top wall of the nasopharynx and the surface of the wall was slightly rough. The biopsy was performed using a microscope. A nodule of about 0.5 cm was observed near the bottom wall of the nasopharynx (the biopsy was not successful due to the excessive angle). The tumor was of low-grade malignancy and was not sensitive to radiotherapy. Therefore, surgery with extended resection was recommended. The patient underwent endoscopic nasopharynx and skull base tumor exploration and enlarged lesion resection plus nasal cavity (nasal septum) tumor resection at our hospital. Using the description of the tumor area from the previous surgery, the nasopharyngeal-craniopharyngeal fascia layer was separated and the posterior wall of the nasopharyngeal roof, bilateral pharyngeal recesses, nasal septum, and bilateral posterior foramen craniopharyngeal fascia. Pathology showed minimal nasopharyngeal lesion tissue and more muscle fiber connective tissue was found; and no malignant epithelial components was found.

Discussion

Only 0.5% of nasopharyngeal malignant tumors are diagnosed as primary adenocarcinoma of the nasopharynx [2]. The most common type of

nasopharyngeal malignancy is squamous cell carcinoma.

Thyroid-like low-grade nasopharyngeal papillary adenocarcinoma (TL-LGNPPA) is a rare type of malignant epithelial tumor with indolent biologic behavior. The World Health Organization categorized malignant epithelial tumors of the nasopharynx into nasopharyngeal, nasopharyngeal papillary adenocarcinoma (NPPA), and salivary gland-type carcinoma [3].

Primary adenocarcinoma of the nasopharynx is very rare and was first reported by Wenig et al. in 1988 [4]. There are no clinical symptoms specific to the disease. Lai et al. reported that the most common symptom was blood-stained rhinorrhea [5]. Sourati et al. reported a patient with a 6-month history of nasal obstruction, which was the second most common symptom [6]. Carrizo et al. reported 2 cases of low-grade papillary adenocarcinoma of the nasopharynx, whose histologic morphology was very similar to that of papillary thyroid carcinoma, and also had the immunohistochemical characteristics of being TTF-1- and CK19-positive [7]. The name thyroid-like low-grade papillary adenocarcinoma of the nasopharynx (TL-LGNPPA) was later accepted and is still in use.

TL-LGNPPA is a rare low-grade malignancy. Tumors are observed anywhere in the nasopharynx but are more common in the top, lateral, and posterior walls of the nasopharynx and at the free border of the nasal septum. The most common clinical symptoms are nasal congestion accompanied by epistaxis, blood in the sputum, throat discomfort, hearing impairment, and headache. In our case, the patient was 20 years old and visited the physician for headaches and nosebleeds. We speculate that the symptoms were related to the size and location of the tumor. In our case, the neoplasm was located on the posterior wall of the nasopharynx. Previous studies demonstrated that the neoplasms are mostly located in the posterior nasal septum [8, 9], which is consistent with our case. Lai et al. reported that the age of onset of LGNPPA has a wide range, from 7 to 77 years old and the incidence is higher in females, with a female-male ratio of 1.5:1 (observed in 17 females and 11 males) [5]. TL-LGNPPA diagnosis involves the combined use of histological examination and identification of immunophenotypes characterized as being strongly positive for TTF-1, CK7, and CK19 [8, 10, 11]. TTF-1, a nuclear transcription protein, is selectively expressed in thyroid follicular cells, neonatal lung, and alveolar type II cells. Therefore, TTF-1 can be used to differentiate TL-LGNPPA from LGNPPA. Thyroid-like low-grade papillary nasopharyngeal carcinoma is a subtype of low-grade papillary nasopharyngeal carcinoma and expresses CK19 and TTF-1 but not TG. Metastatic papillary thyroid carcinoma and lung adenocarcinoma can be distinguished using the index. The case we report was positive for CK19 and TTF-1 [12, 13], confirming that it was thyroid-like low-grade adenocarcinoma.

TL-LGNPPA is a rare low-grade malignant tumor and its biological behavior is different from that of most nasopharyngeal carcinomas. Surgical resection is the preferred treatment option. TL-LGNPPA has no metastatic potential and has a good prognosis. The pathologic diagnosis of the patient should be confirmed and overtreatment should be avoided.

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Disclosure of conflict of interest

None.

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