



RETROSPECTIVE STUDY OF WARTHIN TUMOUR AND ITS DIFFERENTIALS ON IMAGING

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Dr. Sapna Dhiman

Dr. Chandresh

**Dr. Abhishek
Dhiman***

*Corresponding Author

ABSTRACT

Warthin tumors, also known as lymphomatous papillary cystadenomas, are benign, well demarcated tumors of the salivary gland. They are of lymphoid origin and most commonly arise from parotid gland tail. They may be bilateral or multifocal in up to 20% of cases and are the most common neoplastic cause of multiple solid parotid masses. Warthin tumors are the 2nd most common benign parotid tumor and represent up to 10% of all parotid tumors. They are the commonest bilateral or multifocal benign parotid tumor. They typically occur in the elderly (6th decade), and twice as common in men (2.2:1)¹¹. Patients typically present with painless parotid swelling. They are often multicentric (20%) and are usually small (1-4 cm). They have a typically heterogeneous appearance on all modalities, often with cystic components (30%). Tends to favor the parotid tail region at the level of the mandibular angle.

We have done retrospective study of 7 histopath proven cases of warthin tumour and studied the literature to differentiate it from pleomorphic adenoma on imaging.

KEYWORDS

INTRODUCTION

Parotid Warthin's tumor, also called parotid adenolymphoma, is a common benign tumor of the parotid gland with the incidence only next to the pleomorphic adenoma. However, preoperative CT and MR perform poorly in accurately diagnosing the disease, especially for the single focus which is often misdiagnosed as parotid pleomorphic adenoma. In this study, CT and MRI findings of 07 patients with pathologically-confirmed Warthin's tumor were retrospectively analyzed to investigate and summarize the features and consequently improve the knowledge on the disease and the ability of differentiated diagnosis.

MATERIAL AND METHOD

A total of 7 Warthin's tumor patients pathologically confirmed (5 males and 2 females) with a mean age of 56 years (range 44-47 years) were enrolled. These cases presented as the nontender mass which enlarged gradually and 3 had volume-varying masses. All patients underwent CT examination while 2 received MR examination. The aim of the study was to investigate CT and MRI findings of parotid Warthin's tumors (parotid adenolymphomas). We used these findings to differentiate warthin tumour from pleomorphic adenoma using literature.

RESULTS

Size, Location, And Shape Of Tumors

Seven patients presented with 8 Warthin tumors of the parotid gland. One case had bilateral tumor. The average maximal cross-sectional diameter was 2.4 cm (range, 0.8-5.0 cm). Six Warthin tumors were located in the caudal portion of the parotid gland. All tumors showed well-defined margins on T1-weighted and T2-weighted images. Five Warthin tumors showed well-defined margins on fat suppression T1-weighted images, with the other two showing unclear margins, because they were enhanced as much as the parenchyma of the parotid glands did.

Signal Intensities of Tumors

All Warthin tumors had low signal intensity for the salivary gland and isointensity compared with muscle on T1-weighted images. On T2-weighted and STIR images, many Warthin tumors had low-signal-intensity foci. The mean SIR_{min} of Warthin tumors on STIR images (0.29 ± 0.22 SD) was significantly lower ($P < .01$) than that of malignant parotid tumors (0.53 ± 0.19). The mean SIR_{min} of Warthin tumors on T2-weighted images (0.28 ± 0.09) was also significantly lower ($P < .05$) than that of malignant parotid tumors (0.48 ± 0.19).

Time-contrast Enhancement Ratio And Washout Ratio Of Tumors

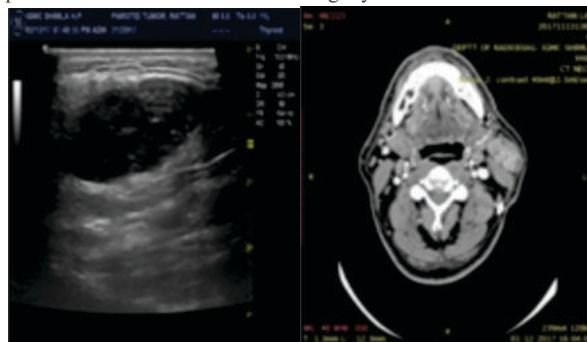
Six Warthin tumors had type A curves, and the other 1 had type B curve.

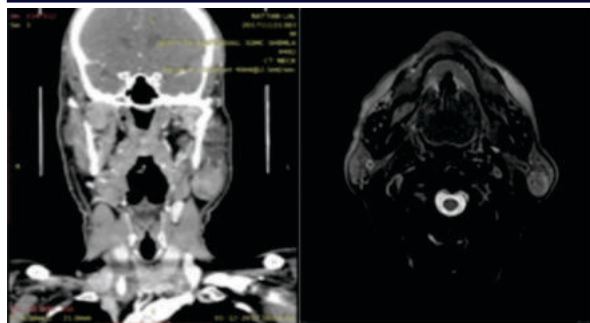
All diffusion-weighted images of 7 Warthin tumors high signal intensities. The average of the ADC values of the Warthin tumors was lower than that of the spinal cord (1.02 ± 0.05 , 0.93 to 1.16×10^{-3} mm²/s), but not significantly

Evaluation Indices

(1) Number and position of foci: the parotid gland was grouped into deep and superficial lobes which was bounded with the line linking the retromandibular vein and inner sternocleidomastoid as the boundary as well as upper and lower poles were bound with the ear lobe. The superficial lobe was divided to the anterior upper, posterior upper, anterior lower and posterior lower. (2) Morphologic features of foci: the mass volume, margin, density or signal, envelope and calcification. (3) Enhancement findings: foci and envelope. The enhancement degree (enhancement net was defined as the difference before and after enhancement) was graded as slight (0-20 HU), middle (20-40 HU) and significant (above 40 HU). (4) Relationship between the tumor and retromandibular vein. (5) Cervical lymph node enlargement: the enlargement criteria was the minimum diameter > 1.0 cm

A total of 8 foci were found in all 7 patients, single in one parotid gland in 6 patients and single in bilateral glands in 1 patients. 6 foci or the main bodies [long diameter of 0.8-5.0 cm with the average of (2.3 ± 1.3) cm] were located in the posterior and interior role of the superficial lobe of the parotid gland. The foci were round or oval. The boundary was smooth in 5 foci and blurred in 3 foci which were proved by biopsy to be accompanied with infection. 5 foci with uniform density and 3 foci with nonuniform density were found in 12 patients under CT plain. A total of 5 foci were enhanced, 3 on significant enhancement, 1 on moderate enhancement and 1 on slight enhancement. The margin was enhanced slightly in 3 foci. In MR images, the signal of tumor was uniform or nonuniform, T1WI showed low signal and T2WI showed moderate or high signal. The envelope displayed signal shadow under plain scan and the enhancement was slightly.





Usg ,cect & Mr Neck Images Showing Well Defined Solid Mass In Tail Region Of Left Parotid With Cystic Areas In Between And Showing Post Contrast Enhancement In Solid Part On Cect And Mr Images.

DISCUSSION

Warthin's tumor, also called adenolymphoma or papillary cystic lymphomatous, accounts of 4%–11.2% of all tumors of the salivary gland [1] and appears mostly in the parotid gland and occasionally in other organs such as the submaxillary gland and pharynx nasalis [2]. However, the cause is still unclear. It is still inconclusive whether it is a true neoplasm or development variation [1]. Currently, Warthin's tumor is popularly believed to be a benign tumor with the incidence simply less than the pleomorphic adenoma of parotid and grows slowly in the last but one position. However, there are still a few of reports with the canceration rate of < 1% [1]. Smoking, as the high risk factor for Warthin's tumor, in this study, 71.4% of patients had the smoking history with the most lasting for 33 years. In recent years more and more females suffer from the disease, which may relate with the increasing smoking rate in females [7]. Parotid Warthin's tumor frequently occurs in elder males of 50–70 years with the male to female ration of approximately 3:1 and the long diameter of the focus of 2–4 cm [6]. In this study, male to female ration was 3:1, the average age was 56 years and the long diameter was (2.3 ± 1.3) cm. Imaging findings Number and position of neoplasm Parotid Warthin's tumor includes single and multiple types with the former having the higher incidence. The 10%–20% of cases have the neoplasm in b A total of 8 foci were found in all 7 patients, single in one parotid gland in 6 patients and single in bilateral glands in 1 patients. 6 foci or the main bodies [long diameter of 0.8–5.0 cm with the average of (2.3 ± 1.3) cm] were located in the posterior and interior role of the superficial lobe of the parotid gland. The foci were round or oval. The boundary was smooth in 5 foci and blurred in 3 foci which were proved by biopsy to be accompanied with infection. 5 foci with uniform density and 3 foci with nonuniform density were found in 12 patients under CT plain. A total of 5 foci were enhanced, 3 on significant enhancement, 1 on moderate enhancement and 1 on slight enhancement. The margin was enhanced slightly in 3 foci. In MR images, the signal of tumor was uniform or nonuniform, T1WI showed low signal and T2WI showed moderate or high signal. The envelope displayed signal shadow under plain scan and the enhancement was slightly.

Appearance and boundary of neoplasm Parotid Warthin's tumor can be round, oval, lobulated or dumbbell-shaped with smooth margin. The complete envelope is the pathologic basis for tumors [6]. Of the 8 foci in this study, 5 displayed round and 3 were oval. 5 foci had smooth margins. In this study, 3 cases with Warthin's tumor showed unclear margin and adjacent parotid tissues increased in density and blurred, which was confirmed as infection by biopsy. However, lymphatic tissues are apt to experience secondary infection and then decline in volume after therapy, so, the disease is characteristic by the history of alternately increasing and decreasing volume [2]. Density or signal of neoplasm Parotid Warthin's tumor is cystic or cystic-solid.

Enhancement, the tumors showed significant enhancement in the early stage and the density decreased rapidly in delayed stage; for MR dynamic enhancement time-intensity curve, most displayed Type B (sped-ascend and sped descend) and a few was Type D (flat) [5, 9]. Choi DS et al [8] believed that enhancement modes were affected by multiple biological factors. Adenolymphoma could peak within 30 seconds after advancement scan, which was related with high capillaries. Washout ratio $\geq 30\%$ may result from the grade of cellularity-stromal grade of tumors, that is more cells, higher grade, more stroma, more concentrating contrasts and lower washout ratio.

Kuang PD et al [4] proved by biopsy that more capillaries were found in foci and showed distention of different degree, which implied rich blood supply. Relationship between tumor and peripheral vessels Warthin's tumor is a benign one predominantly occurring in the posterior and interior part of the parotid gland.

The mean ADC values are very low ($0.81-0.96 \times 10^{-3} \text{ mm}^2/\text{sec}$), a finding that is helpful to differentiate them (together with their morphologic characteristics) either from pleomorphic adenomas ($2 \times 10^{-3} \text{ mm}^2/\text{sec}$) or from malignant tumors ($1.29-1.38 \times 10^{-3} \text{ mm}^2/\text{sec}$). The differential diagnosis of Warthin's tumor includes benign mixed tumor, benign adenopathy, lymphoma, benign lymphoepithelial lesions – HIV, adenoid cystic or mucoepidermoid carcinoma, as well as squamous cell carcinoma and melanoma nodal metastasis. When a benign mixed tumor is small, it is a well-circumscribed, homogenous, intraparotid mass. On the contrary the larger lesions may be inhomogeneous and mimic Warthin's tumors. The benign lymphoepithelial lesions may strongly mimic Warthin's tumors, when they are unilateral and singular. Tonsillar hyperplasia and cervical adenopathy may help in the differential diagnosis. Low grade parotid malignancy like adenoid cystic or mucoepidermoid carcinoma may be well demarcated, while in higher grade, more advanced parotid malignancy, the differential diagnosis is easy because of its invasive appearance on imaging. In the squamous cell carcinoma or melanoma nodal metastases, a primary malignancy can be found on or around the skin of the ear with single or multiple parotid masses with invasive margins and often with central necrosis.