Ultrasound-guided percutaneous microwave ablation of parotid gland adenolymphoma
A case report

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Abstract
Rationale: Parotid gland adenolymphoma is one of the most common benign tumors in parotid gland, and mainly treated by surgery. Despite the widespread of ultrasound-guided percutaneous microwave ablation, there is no report concerning its application in parotid gland adenolymphoma. Herein, we reported a 2-year follow-up result of a male patient underwent ultrasound-guided percutaneous microwave ablation for parotid gland adenolymphoma.

Patient concerns: A 73-year-old man was admitted due to a hypoechoic nodule measuring 2.67 × 1.42 × 1.35 cm in posterior-inferior area of parotid gland with a high flow velocity in color Doppler flow imaging.

Diagnose: The lesion was pathologically diagnosed as parotid gland adenolymphoma.

Interventions: Ultrasound-guided percutaneous microwave ablation was performed to the tumor due to the fact that the patient refused to receive an open surgery in consideration of older age.

Outcomes: The ablation procedure lasted about 2 minutes and 15 seconds, without significant adverse effect. The reduction ratios of tumor at postoperative 1 and 3-month were 53% and 82%, respectively. The tumor was fully absent at postoperative 8-month evaluation. Finally, there was no evident recurrence at postoperative 24-month evaluation.

Lessons: Ultrasound-guided percutaneous microwave ablation is a safe and effective treatment for parotid gland adenolymphoma, which may serve as a novel alternative approach for patients unsuitable for open surgery.

Abbreviation: HE = haematoxylin-eosin.

Keywords: microwave ablation, parotid gland adenolymphoma, ultrasound

1. Introduction
Parotid gland adenolymphoma is also known as lymphatic cystadenoma, papillary cystadenoma lymphomatosum, or Warthin tumor, which originates from lymph nodes in parotid gland and develops as a heterotopic lymphoepithelial lesion.[1,2] Parotid gland adenolymphoma mainly affects aging men, and is associated with smoking.[3] Parotid gland adenolymphoma usually appears as a round or oval lesion located in superficial lobe, and some larger ones appear lobulated.[4] Surgery is still considered as the main treatment for parotid gland adenolymphoma. However, surgery may bring up severe trauma and poor cosmetic outcomes. Ultrasound-guided percutaneous microwave ablation is a minimally invasive approach, which has been widely applied in tumor treatment. In this study, we reported a male elderly patient underwent ultrasound-guided percutaneous microwave ablation for pathologically diagnosed parotid gland adenolymphoma.

2. Case report
This study was performed according to the relevant guidelines of the ethics review board of the Affiliated Hospital of Changchun University of Traditional Chinese Medicine. Informed written consent was obtained from the patient for publication of this case report and accompanying images.

A 73-year-old male patient was admitted due to tumor in retroauricular region. Ultrasonic examination showed an oval hypoechoic nodule with clear border and complete capsule in posterior-inferior area of left parotid gland, measuring 2.67 × 1.42 × 1.35 cm, with a high flow velocity in color Doppler flow imaging (Fig. 1A and B). Then, the lesion was pathologically diagnosed as parotid gland adenolymphoma (Fig. 2). We proposed that the patient should receive open surgery. However, he refused to receive an open surgery in consideration of older age, a comorbidity of cirrhosis, and renal insufficiency. Therefore, we decided to perform ultrasound-guided percutaneous microwave ablation after carefully evaluation.
Following the regular ultrasound evaluation of tumor, preoperative hemocoagulase administration and operation preparations were performed. The patient was in the right lateral position. A small incision was made after local anesthesia with 1% lidocaine. Saline was injected surrounding tumor for isolation (Fig. 3A). A power output of 30W was used during microwave ablation. The microwave antenna was placed into the parathyroid adenoma under ultrasound guidance according to preoperative established plan. Then the moving-shot ablation technique together with ultrasound-guided stratified conformal ablation was performed along the border of tumor from superior to inferior, posterior to anterior, and inside to outside (Fig. 3B). The extent of the ablation area was based on the echogenic change around the antenna. Ablation process stopped until fully coverage of tumor by vaporized area. Total ablation time was 2 minutes and 15 seconds. Contrast-enhanced ultrasound showed no enhancement in the entire ablation area at 10 minutes after ablation (Fig. 3C).

During ablation, patient’s vital signs including blood pressure and heart rate were stable. He had a well tolerance to ablation. Moreover, there was no significant adverse effect after microwave ablation. The tumor size at both post-ablation 1-month and 3-month ultrasound evaluation was decreased, measuring 1.72 × 1.47 × 0.95 cm (reduction ratio, 53%) and 1.43 × 0.79 × 0.79 cm (reduction ratio, 82%), respectively (Fig. 4A and B). The tumor was fully absent at postoperative 8-month evaluation (Fig. 4A and B). Finally, there was no evident recurrence at postoperative 24-month evaluation.
In various cancers.\(^{[12]}\)

Invasive and effective thermal ablation, has been widely used percutaneous microwave ablation, as a kind of minimally ultrasound-guided percutaneous microwave. Ultrasound-guided due to incompliance to open surgery, the patient underwent patient ratio is approximately (2.6\(\text{–}10.0\))/L.\(^{[5]}\) This tumor is characterized by complete capsule, homogeneous growth, regular morphology, and abundant blood supply.\(^{[6]}\)

Surgery is the main treatment for parotid gland adenolymphoma.\(^{[1]}\) However, there is a high incidence of complications following surgery, including facial palsy, salivary fistula, gustatory sweating syndrome, and insensible earlobe, which seriously affect the quality of life of patients.\(^{[8]}\) In our study, due to incompliance to open surgery, the patient underwent ultrasound-guided percutaneous microwave. Ultrasound-guided percutaneous microwave ablation, as a kind of minimally invasive and effective thermal ablation, has been widely used in various cancers.\(^{[12–14]}\) Moreover, microwave ablation can deliver a higher ablation temperature in a shorter duration, and be less affected by heat sink effect, which is suitable for patients refused or incompliance to open surgery. The contradictions of microwave ablation include severe coagulopathy and multiple organ failure. For the case in our study, we conducted a complete evaluation and literature review. The microwave ablation application in parotid gland adenolymphoma has not been reported. During microwave ablation process, the ablation energy may adversely injure critical structures in parotid gland and other adjacent structures, such as facial nerve and parotid duct, skin, and result in postoperative complications including facial palsy, salivary fistula, gustatory sweating syndrome, insensible earlobe, and skin burn. Therefore, we injected saline surrounding tumor to isolate the surrounding tissues and continually used ice saline on the puncture site to avoid skin burn. We also used moving-shot ablation technique together with ultrasound-guided stratified conformal ablation to ablate the tumor meanwhile minimizing the adverse injury to surrounding normal tissues. There was no obvious discomfort or significant complication after microwave ablation. The main components of parotid gland adenolymphoma are epithelium and lymphoid tissue with an excellent heat transfer property, which may explain the quick absorption of parotid gland adenolymphoma after ablation. The microwave ablation can be used for the treatment of epithelial lesions and the most common one is benign thyroid nodule, in which a superior efficacy is observed.\(^{[13,15,16]}\)

Furthermore, the microwave ablation has a fine effect on metastatic lymph nodes of thyroid cancer.\(^{[17–20]}\) In this study, we also obtained a superior efficacy, and the postoperative evaluation showed that the tumor was fully decomposed and absorbed at 8 months after ablation.

In conclusion, ultrasound-guided percutaneous microwave ablation is a safe and effective treatment for parotid gland adenolymphoma, which may serve as a novel alternative approach for patients unsuitable for open surgery.

### Author contributions

Methodology: Mingyue Jin, Jili Fu, Jianbo Lu, Wanying Xu, Xue Wang, Zhibin Cong.

Resources: Zhibin Cong.

Software: Hui Chi.

Supervision: Mingyue Jin, Jili Fu.

Writing – original draft: Hui Chi, Zhibin Cong.

Writing – review & editing: Zhibin Cong.

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