

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 $2.67 \times 1.42 \times 1.35$ 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 $2.67 \times 1.42 \times 1.35$ 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.

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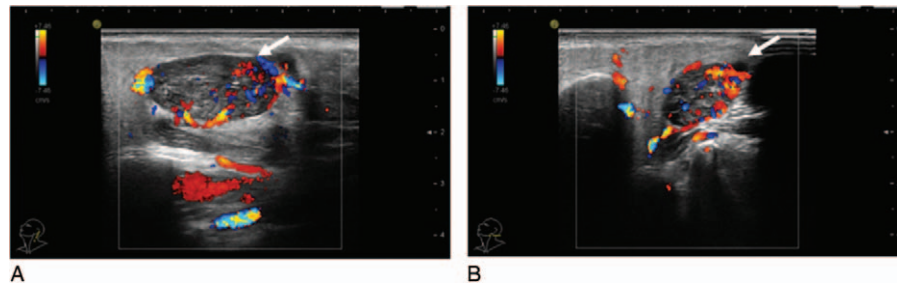


Figure 1. Ultrasonic examination before ablation. Ultrasonic examination showed an oval hypoechoic nodule in posterior-inferior area of left parotid gland, with clear border and complete capsule and a high flow velocity in Color Doppler Flow Imaging. (A) Cross-section images; (B) longitudinal section images.

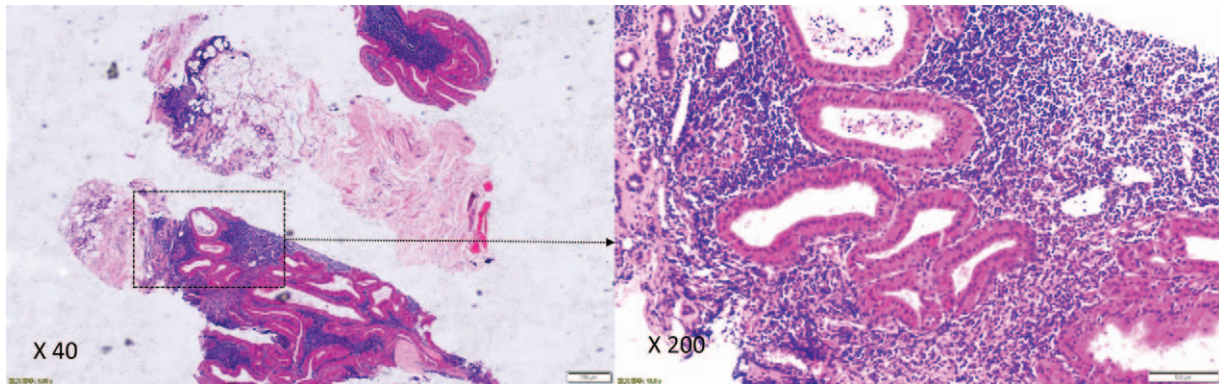


Figure 2. HE staining of parotid gland adenolymphoma. Magnification: $\times 200$. HE = haematoxylin-eosin.

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 30 W 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 $1.72 \times 1.47 \times 0.95$ cm (reduction ratio, 53%) and $1.43 \times 0.79 \times 0.79$ 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.



Figure 3. Ablation procedure. (A) Saline was injected surrounding the tumor to protect the surrounding tissues. The arrow indicates the saline solution. (B) A moving-shot ablation technique together with ultrasound-guided stratified conformal ablation was used. (C) Contrast-enhanced ultrasound showed no enhancement in the whole ablation area at 10 minutes after ablation.

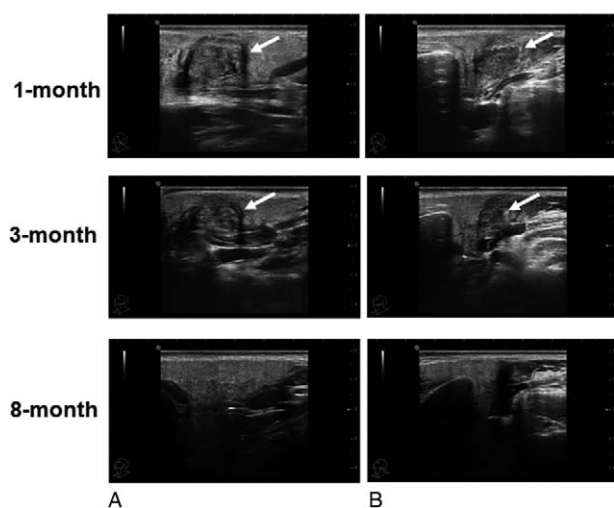


Figure 4. Post-ablation 1-month, 3-month, and 8-month ultrasound evaluation. The tumor (arrow) sizes were $1.72 \times 1.47 \times 0.95$ cm (reduction ratio, 53%), $1.43 \times 0.79 \times 0.79$ cm (reduction ratio, 82%), and 0 cm. (A) Cross-section images; (B) longitudinal section images.

3. Discussion

Parotid gland adenolymphoma is a benign tumor found frequently in inferior area of earlobe (i.e., superficial lobe of parotid gland with more lymph nodes).^[4] Most of the patients have a clinic visit for presentation of space occupying lesions in earlobe. Parotid gland adenolymphoma frequently affects unilateral parotid gland. Males aged 50 to 70 years are more susceptible to parotid gland adenolymphoma. The male/female patient ratio is approximately (2.6–10.0)/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.^[7] 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.^[8–11] In our study, due to incompletion 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 incompletion 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.

References

- Bernier JL, Bhaskar SN. Lymphoepithelial lesions of salivary glands; histogenesis and classification based on 186 cases. *Cancer* 2015; 11:1156–79.
- Simpson RHW, Eveson JW, Barnes L, Eveson JW, Reichart P, Sidransky D. Warthin tumour. *World Health Organization Classification of Tumours: Pathology and Genetics of Head and Neck Tumours* Lyon, France: IARC Press; 2005;263–5.
- de Ru JA, Plantinga RF, Majoor MH, et al. Warthin's tumour and smoking. *B-Ent* 2005;1:63–6.
- Thangarajah T, Reddy VM, Castellanos-Arango F, et al. Current controversies in the management of Warthin tumour. *Postgrad Med J* 2009;85:3–8.
- Yoo GH, Eisele DW, Askin FB, et al. Warthin's tumor: a 40-year experience at The Johns Hopkins Hospital. *Laryngoscope* 2010;104: 799–803.
- Ebbs SR, Webb AJ. Adenolymphoma of the parotid: aetiology, diagnosis and treatment. *Br J Surg* 1986;73:627–30.
- Baj A, Beltramini GA, Demarchi M, et al. Bilateral SMAS rhytidectomy in parotid recurrent pleomorphic adenoma. *Acta Otorhinolaryngol Ital* 2011;31:256–8.
- Mcgurk M, Renehan A. *Controversies in the Management of Salivary Gland Diseases*. New York: Oxford University Press; 2001.
- Nouraei SA, Ismail Y, Ferguson MS, et al. Analysis of complications following surgical treatment of benign parotid disease. *ANZ J Surg* 2008;78:134–8.
- Upton DC, Menamar JP, Connor NP, et al. Parotidectomy: ten-year review of 237 cases at a single institution. *Otolaryngol Head Neck Surg* 2007;136:788–92.
- Yuan X, Gao Z, Jiang H, et al. Predictors of facial palsy after surgery for benign parotid disease: multivariate analysis of 626 operations. *Head Neck* 2009;31:1588–92.
- Shi F, Li G, Zhou Z, et al. Microwave ablation versus radiofrequency ablation for the treatment of pulmonary tumors. *Oncotarget* 2017; 8:109791–8.

- [13] Yue W, Wang S, Wang B, et al. Ultrasound guided percutaneous microwave ablation of benign thyroid nodules: safety and imaging follow-up in 222 patients. *Eur J Radiol* 2013;82:e11–6.
- [14] Ziemlewicz TJ, Hinshaw JL, Lubner MG, et al. Percutaneous microwave ablation of hepatocellular carcinoma with a gas-cooled system: initial clinical results with 107 tumors. *J Vasc Interv Radiol* 2015;26:62–8.
- [15] Baek JH, Valcavi R, Pacella CM, et al. Thermal ablation for benign thyroid nodules: radiofrequency and laser. *Korean J Radiol* 2011;12:525–40.
- [16] Lim HK, Lee JH, Ha EJ, et al. Radiofrequency ablation of benign non-functioning thyroid nodules: 4-year follow-up results for 111 patients. *Eur J Radiol* 2013;23:1044–9.
- [17] Suh CH, Baek JH, Choi YJ, et al. Efficacy and safety of radiofrequency and ethanol ablation for treating locally recurrent thyroid cancer: a systematic review and meta-analysis. *Thyroid* 2016;26:420–8.
- [18] Mauri G, Cova L, Tondolo T, et al. Percutaneous laser ablation of metastatic lymph nodes in the neck from papillary thyroid carcinoma: preliminary results. *J Clin Endocrinol Metab* 2013;98:E1203–7.
- [19] Zhou W, Zhang L, Zhan W, et al. Percutaneous laser ablation of locally recurrent papillary thyroid carcinoma <15 mm. *Clin Radiol* 2016;71:1233–9.
- [20] Lee SJ, Jung SL, Kim BS, et al. Radiofrequency ablation to treat loco-regional recurrence of well-differentiated thyroid carcinoma. *Korean J Radiol* 2014;15:817–26.