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Case Report

A case of vocal cord paralysis after thyroid nodule microwave ablation

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Abstract

Most thyroid nodules show benign features and some of them need treatment for various reasons. Treatment options include levothyroxine, ethanol injection, laser ablation, radiofrequency ablation, and thyroid surgery. The use of the microwave ablation technique presented in thyroid nodules has been reported in recent years. The wider ablation zone, shorter processing time, and prominent tumor death stand out as a targeting process, as well as creating unwanted effects such as heat sensation, pain, bleeding, fever, cough, swallowing abnormalities, and sound changes. The risk of nerve damage is very low in the microwave ablation technique. In the case of recurrent nerve paralysis, it is important to perform a laryngoscopic examination by the otolaryngologist and to call the patient for monthly outpatient clinic controls to check for temporary or permanent paralysis. In this case report, a 56-year-old woman who developed vocal cord paresis after a minimally invasive microwave ablation procedure, which has gained importance in recent years, was presented radiologically and clinically.

Keywords: ablation; hoarseness; laryngeal nerve palsy; thyroid nodule; vocal cord paralysis

1. Introduction

Thyroid nodules are found 3-7% by palpation, and 20-76% in ultrasound-guided examinations [1]. Most thyroid nodules are benign, however, some may need treatment for subjective reasons such as cosmetic reasons, and the possibility of malignant transformation [2]. In addition, if some large, compressive thyroid tissues are not intervened, it is vital because it can lead to potential acute onset respiratory events [3].

Conventional treatment options include levothyroxine use, ethanol injection, laser ablation, radiofrequency ablation, and thyroid surgery. Surgical and medical treatments have drawbacks. Although surgery is curative, it can cause non-aesthetic scars, respiratory distress, and laryngeal nerve damage. In addition, non-surgical, minimally invasive; laser ablation, ethanol injection, radiofrequency ablation (RFA) methods have been tried and successful results have been obtained [4].

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Microwave ablation (MWA) technique is a minimally invasive technique used in the treatment of benign and malignant lung and kidney tumors. It's also use in thyroid nodules has been started in recent years. Compared to RFA, MWA; it aims to have a wider ablation zone, shorter processing time, and near tumor destruction. It is also safer in terms of heat injury [5]. Complications of MWA treatment include heat sensation in the neck and on the application area, pain, bleeding, fever, cough, drowning sensation while drinking water, and sound changes.

In this case report, a 56-year-old woman who developed vocal cord paresis after a minimally invasive MWA procedure, which has gained importance in recent years, was presented radiologically and clinically.

2. Case Report

A 56-year-old female patient underwent an endocrinology department due to a 3 cm x 5 cm thyroid nodule, and a fine needle aspiration biopsy was performed through interventional radiology and the histopathological result was reported as a benign follicular nodule. Then, radiofrequency ablation was performed by interventional radiology in July 2019, and monthly ultrasonography was followed, and the thyroid nodule size decreased to 1.5 cm x 3 cm, and thyroid function tests were within normal limits. As an additional disease, Type 2 Diabetes Mellitus (DM) was present.

Microwave ablation was performed to the same 1.5 x 3 cm nodule by interventional radiology in January 2020, using a 3 mm tip probe during 30-watt energy three min process. The patient, who did not describe any complaints in the early period after the procedure, was consulted to the otorhinolaryngology diseases outpatient clinic after she described that she had a voice change when she came for control one month later [Figure 1].

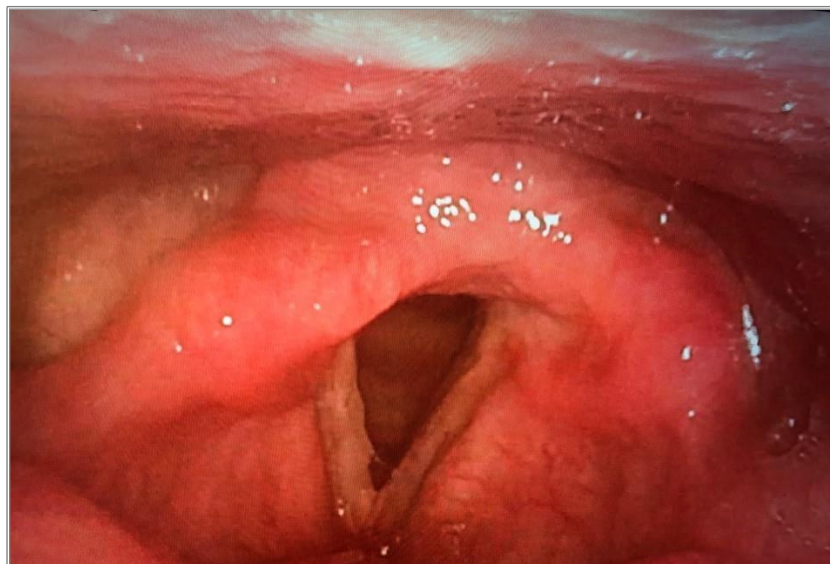


Figure 1. Video laryngoscopic view of right vocal cord paralysis.

In our examination, nasal examination and otoscopic examination did not reveal pathology. In the head and neck examination, a 2 mm scar line suitable for the application entry was present, and hoarseness was detected in the sound. In the laryngoscopic examination, we observed that the right vocal cord showed paralysis (movement restriction). Because the patient had a history of DM, she was followed up with anti-inflammatory drug therapy. On the 2nd and 3rd months of control laryngoscopic evaluation, vocal cord mobility, and the patient's hoarseness complaints decreased. In the 4th month of laryngoscopy, the patient's voice quality was almost normal and vocal cord mobility was normal.

3. Discussion

Thyroid nodules are very common in the general population. Even if it is benign, it can grow over the years and be symptomatic. Our patient had also a 3 cm x 5 cm benign follicular thyroid nodule. For thyroid nodules, surgical and minimally invasive treatment options are used as treatment. Minimally invasive options have advantages such as no scar formation, no iatrogenic hypothyroidism, and cost-effectiveness. These transactions can be counted as RFA, LA, and MWA. In our patient, RF and MWA procedures were performed by interventional radiology, respectively.

When the side effects of these procedures were compared with surgery, the most frequent recurrent nerve palsy was shown in 11.8% (9.8% transient, 2% permanent) surgical procedures, besides RFA and LA procedures were performed at rates of 0 to 8% [6,7]. Compared to RFA, MWA seemed to have similar complication rates and slightly less efficacy [1]. Our patient's complication occurred after MWA.

In another study, it is suggested that the complication rate of the MWA technique was higher when compared to other ablation techniques. The reason for this was suggested that the needle diameters of the probes used were due to the fact that they were more invasive in MWA (16G) compared to RFA (17G) and LA (21G) [8]. In the same study, the authors stated that avoiding iatrogenic nerve damage completely was difficult even if the nerve line was completely traceable [10]. In another study, it was stated that MWA complained of postop pain in one patient and hoarseness in one patient, which was safe and well-tolerated; suggested that this positive result may have been due, in part, to the use of a moving shot technique aimed at minimizing thermal damage [9].

In the study of Feng et al. for thermal nerve damage, the most likely explanation was that thermal damage could be directly; or perinodular edema and nerve compression. It is stated that various measures can be taken to reduce damage. These are, firstly, one-sided processing in the presence of a bilateral nodule; thus, avoiding bilateral uncompensable nerve damage, secondly, if close to the nerve, ablation of all thyroid nodules is not always necessary, thirdly, it can be counted as protecting the nerve from possible thermal damage by thermal monitoring or saline infusion into the nodule capsule [8]. In the study of X Zhi et al., they stated that the nodule size of the patient who experienced hoarseness after the procedure was larger and the duration of the procedure was longer than those without nerve damage [9]. Our patient's nodule size was 1.5 x 3 cm before the MWA.

In some cases, if nerve damage is detected during the procedure, saline infusion to the field is recommended. We have detected the nerve paresis in the first-month control. However, no treatment protocol has been specified for subsequent damage. In addition, one month of oral corticosteroid use after thyroid surgery or steroid use during surgery is suggested by some surgeons to prevent perineural edema [10]. In such ideas, it can be tried for intervention to nerve damage. We preferred anti-inflammatory treatment because our patient had paresis and was diabetic. In this case, the patient's complaint of hoarseness and vocal cord paralysis in laryngoscopic evaluation has recovered in the monthly follow-up.

Consequently, the risk of nerve damage is very low in the MWA. In the case of recurrent nerve paralysis, it is important to perform a laryngoscopic examination by the otolaryngologist and to call the patient for monthly outpatient clinic controls to evaluate temporary or permanent paralysis. A standard nerve injury treatment has not yet been established and larger studies and protocols are needed in this area.

Conflict of interest

The authors declare no conflict of interest.

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