

## Short Communication



# Efficacy of Percutaneous Thermal Ablation of Papillary Thyroid Carcinoma

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## ABSTRACT

Percutaneous thermoablation (PTA) has become an increasingly used option in the interventional treatment of symptomatic, cytologic and sonographic benign solid thyroid gland disease. Currently, there is no high-level evidence of treatment for differentiated thyroid cancer by means of PTA. Surgery is a standard treatment for primary and also for recurrent thyroid cancer, followed by radioactive iodine and thyroid hormone therapy. PTA, however, can be used in patients at high-risk and in patients who refuse to undergo repeated surgery. The Task Force Committee of the Korean Society of Thyroid Radiology has developed recommendations for the optimal use of PTA for thyroid nodules. However, there are still several questions on safe distance to the laryngeal nerves, no data on duration of PTA application around the nerves, no intra-procedure assessment of laryngeal nerves function and position. Future experimental studies are required.

**Keywords:** Papillary thyroid carcinoma; Thyroid

In the last 2 decades, percutaneous thermoablation (PTA) (i.e., radiofrequency ablation, microwave ablation, and laser ablation) has become an increasingly used option in the interventional treatment of symptomatic, cytologic and sonographic benign solid thyroid gland disease (1,2).

The use of this technique for the treatment of low-risk papillary carcinoma (PTC) has, as expected, led to a controversial debate (1-10) (**Table 1**).

The main arguments against the use of PTA in this indication are the guidelines of various National and International specialist societies, which have hitherto been opposed to the PTC (1-10). Reports of carcinoma detection in puncture channels, abscess formation and detection of incomplete PTAs have been reported (1-10).

Currently, there is no high-level evidence of treatment for differentiated thyroid cancer by means of PTA (1-10). PTA for operable primary thyroid cancer should be avoided, because of the possibility of remnant viable cancer and undetectable node metastases. Surgery is a standard treatment for primary and also for recurrent thyroid cancer, followed by radioactive

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**Table 1.** PTA; surgeon's point of view and questions

Questions
• Can thyroid PTA substitute surgery?
• May PTA substitute minimally invasive surgery?
• Is PTA a scientific progress?
• Oncological concern
• Safety of PTA (with emphasis on laryngeal nerves)

PTA = percutaneous thermal ablation.

iodine and thyroid hormone therapy. PTA, however, can be used in patients at high-risk and in patients who refuse to undergo repeated surgery.

A recent study reported a total of 29 cases of residual tumor after PTA for primary PTC (5). This is the largest reported study on incomplete, histological proved PTA (5). The surgical patients had to meet the following criteria: primary PTC treated with PTA, and findings suspicious for malignancy of the post-PTA lesions on US or malignancy confirmed by cytology, or with clinical evidence of cervical lymph node metastasis (LNM). Moreover, a systematic review of the literature was made to analyze relevant cases. The study included twelve patients. Percutaneously US guidance ablation was offered in 22 small tumor foci (mean size 13±7 mm). Pre-operative laryngeal examination demonstrated that one (8.3%) recurrent laryngeal nerve was injured by previous PTA. During surgery, adhesion due to post-PTA with the strap muscles was observed in 6 (50%) procedures. The strap muscles were cauterized in 5 (41%) subjects. Definitive histopathology revealed residual PTCs in all (100%) cases and LNM in 66.7% of the patients (5). The work has its weaknesses. The biggest weakness is that it does not give any idea of the quantitative dimension of what it proves: the safety of the complete elimination of the primary tumor by PTA is just as lacking as the exclusion of multifocal, not by the PTA reached tumor foci (5,10). The warning of the specialist associations before the use of PTA in primary thyroid carcinomas is therefore justified (5,10). As can be seen from the number of papers published in recent years, despite the fact that this study was conducted in the past, there has been a hype about the so-called "active surveillance" of papillary low-income populations based on scientifically insufficiently designed and ethically problematical studies (10). The step of some working groups, especially in those countries where PTA is most prevalent, was not surprising for the PTA of these carcinomas (5,6,10). Despite its weaknesses, the presented work is a very important contribution to substantiate the concerns about PTA for the treatment of primary thyroid carcinomas (10). Thermal ablation should be recommended with caution as treatment of operable patients with primary PTC.

Furthermore, the work point out another important issue, i.e. surgery is complementary and feasible operative method for nodules previously treated with PTA. However, only surgeons who receive sufficient training in endocrine surgery can perform re-do surgery after complete, incomplete or complicated PTA.

Finally, it is essential that the value and safety of PTA be established before it is widely used on patients. Standardized use of thyroid nodule ablation technique has been described. The Task Force Committee of the Korean Society of Thyroid Radiology has developed recommendations for the optimal use of PTA for thyroid nodules (11). The recommendations were based on a comprehensive analysis of the literature, the results of multicenter studies, and expert consensus. The recommendations include the 1) moving shot technique, 2) the trans-isthmic technique, 3) verification of laryngeal nerve location before ablation, and 4) continuous and cautious US-guided tracing (9,11). However, there are still several questions

**Table 2.** Criticality of thyroid percutaneous thermal ablation around the laryngeal nerves

Criticality
• Zuckerkandl's tubercle nodule location
• Thyroid bed recurrence
• Recurrent laryngeal nerve displacement by thyroid nodule
• Upper pole nodule (closeness with external branch superior laryngeal nerve)
• Variability of laryngeal nerves anatomy and position
• Laryngeal nerve adhesion from thyroiditis
• Before proceeding to the other lobe (simultaneous bilateral procedures) check vocal cord function
• Avoid ablation when contralateral vocal cord paralysis is present.

on safe distance to the laryngeal nerves, no data on duration of PTA application around the nerves, no intra-procedure assessment of laryngeal nerves function and position (**Table 2**). Future experimental studies are required.

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