

Percutaneous Ethanol Ablation for Management of Cystic Thyroid Nodules: A Case Report

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ABSTRACT

Introduction: Percutaneous Ethanol Ablation (PEA) has been recommended as the first-line treatment option for symptomatic benign cystic or predominantly cystic thyroid nodules, and it has been shown to be more effective and safer than other techniques in previous studies. Here, we present a case of a 44-year-old man with thyroid nodules who underwent PEA.

Case Presentation: We report the case of a 44-year-old man with a painless mass that is getting bigger on his right neck. The physical examination measured 3.0 × 3.0 × 3.0 cm, mobile on swallowing, no pain on palpation. Thyroid function tests show a euthyroid state (TSH 2.4 mIU/L, FT4 1.2 ng/dL). The ultrasound examination in January 2020 showed a colloid cyst on the right thyroid, measured 3.03 × 2.82 × 3.56 cm (TIRADS 1). Cytological examination showed the results of non-infectious cystic fluid. The patient underwent US-guided PEA using 7 ml of ethanol by the moving-shot technique. The procedure was well tolerated by the patient and no adverse events were noted. A week after the procedure, there was a visible and progressive reduction of the nodule with no complaint from the patient. A month after the procedure, the patient came back with no recurrences, complaints, or other complications.

Conclusions: PEA for thyroid lesions is an effective and safe method. PEA should be the first option for the treatment of pure cystic and predominantly cystic nodules. PEA is a safe procedure that is easy to repeat and to be performed on an outpatient basis.

INTRODUCTION

Thyroid nodule is a common disease that can either be palpated or made out during imaging like ultrasonography (USG). The prevalence of clinically palpable thyroid nodule was about 4–7% and increased to 20–76% when USG was used for detection. However, most of these nodules (>90%) are benign and relatively unchanged over time; generally, only observations and guarantees are needed [1–3]. Thyroid surgery is the most common management performed with minimal complications and mortality. Thyroid surgery is the first-line treatment for recurrent thyroid cysts producing aesthetic complaints or compressive symptoms. However, there are several obstacles including the incision that causes cosmetic problems, pain, numbness, and discomfort [4,5]. Over the last two decades, several nonsurgical minimally invasive approaches for treating thyroid nodules have been developed and represent an acceptable alternative to surgery for treating symptomatic benign thyroid nodules. These techniques include percutaneous ethanol ablation, laser ablation, and radio frequency

ablation (RFA) [1–3]. Percutaneous Ethanol Ablation (PEA) has been recommended as the first-line treatment option for symptomatic benign cystic or predominantly cystic thyroid nodules, and it has been shown to be more effective and safer than other techniques in previous studies [6,7]. Here, we present a case of a 44-year-old man with thyroid nodules who underwent PEA.

CASE PRESENTATION

We report the case of a 44-year-old man present with a painless mass that is getting bigger on his right neck. The physical examination confirmed the presence of a soft-elastic mass on the right side of the neck, measured 3.0 × 3.0 × 3.0 cm, mobile on swallowing, no pain on palpation (**Figure 1**). Thyroid function tests show a euthyroid state (TSH 2.4 mIU/L, FT4 1.2 ng/dL). The ultrasound examination in January 2020 showed a colloid cyst on the right thyroid, measured 3.03 × 2.82 × 3.56 cm (TIRADS 1) (**Figure 2**). The cytological examination showed the results of non-infectious cystic

fluid. The patient underwent US-guided PEA using 7 ml of ethanol by the moving-shot technique. The procedure was well tolerated by the patient and no adverse events were noted (Figure 3). A week after the procedure, there was a visible and progressive reduction of the nodule with no complaint from the patient (Figure 4).

A month after the procedure, the patient came back with no recurrences, complaints, or other complications (Figure 5).



Figure 1. A 44 years old man before US-guided percutaneous EA

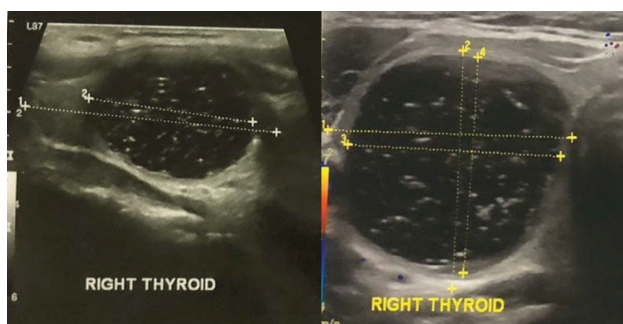


Figure 2. The ultrasound on the right thyroid there was colloid cyst

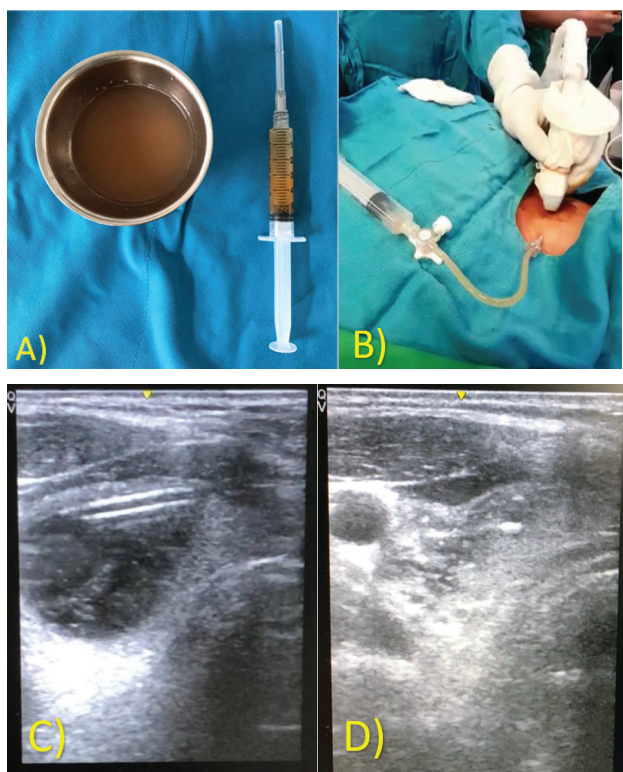


Figure 3. 7 ml ethanol injection (A), PEA procedure (B) US guiding on PEA procedure (C), US examination after PEA procedure (D)



Figure 4. A 44 years old man after 1 week PEA procedure

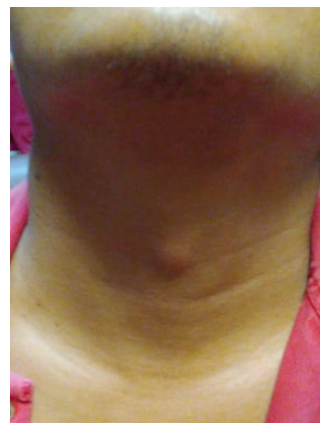


Figure 5. A 44 years old man after 1 month PEA procedure

DISCUSSION

PEA is widely used as a nonsurgical treatment usually for cystic or predominantly cystic benign thyroid nodules. The mechanisms include coagulative necrosis and ischemic necrosis. Coagulative necrosis is due to cell dehydration and protein denaturation due to diffusion. Then, ischemic necrosis is due to the formation of small blood vessel thrombus and inhibition of enzymatic activity in the tissues [8].

The indications of PEA depend on clinical conditions and patient preference. Benign thyroid nodules (cystic nodules, predominantly cystic nodules, and hyper functioning thyroid nodules) and malignant thyroid nodules (Recurrent thyroid carcinoma and primary thyroid carcinoma) are indications based on clinical conditions [8]. Patient preference is a relative indication in case of contraindication to or refusal of surgery and radioiodine therapy [9]. According to ATA, PEA is the first-line therapy for cystic nodules and predominantly cystic nodules [10].

Simple aspiration is used for diagnosis and to reduce cyst volume. The estimated cyst volume in our case was around 14 cc with an aspiration of 90% of that volume and 7 ml of ethanol. The volume of ethanol injected is usually as much as 50% of the volume of the aspirated liquid [11].

Reverter et al. reported PEA reduced cysts were > 70 % in volume in 86.3 % patients, > 80 % in 61.9 % patients, and > 90 % in 42 % patients. Comparing

efficacy to another minimally invasive procedure for thyroid cysts, laser ablation was 68%, RFA was 93.3%, and PEA was 96.9%. Furthermore, PEA is easier, safer, and less expensive than RFA [5,12]. It is estimated that around 5-25% of patients have had an EA have a recurrence. The efficacy of the EA procedure depends on the number of solid components in the nodule, the initial size of the nodule, and the amount of ethanol injected. Repetition of the EA procedure is carried out in the first to the third month of evaluation. In the fourth month, if there is still recurrence, the patient is offered a hemithyroidectomy [11,13].

PEA does not need local anesthesia because there is only a transient sensation of pain with relief within minutes, completed procedure in a few minutes, and it can be performed easily on an outpatient basis [14]. The complications such as localized pain and hematoma in the puncture site, facial flushing, drunken sense, hoarseness, dyspnea, and temporary hyperthyroidism are unusual and mostly due to technical mistakes [8,12]. Fibrosis is a complication that can occur due to the EA procedure. Although the incidence is very minimal, fibrosis can inhibit the effects of ablation, especially in cystic predominant nodules [7].

For future directions, patient follow-up should be done monthly and an ultrasound examination annually. This is needed to look for recurrence and further complications.

CONCLUSIONS

PEA for thyroid lesions is an effective and safe method. PEA should be the first option for the treatment of pure cystic and predominantly cystic nodules. PEA is a safe procedure that is easy to repeat and to be performed on an outpatient basis.

DECLARATIONS

Competing interest

The authors declare no competing interest in this study.

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