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Percutaneous Ethanol Injection Therapy for Inoperable Differentiated Thyroid Carcinoma: Report of a Case

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Abstract We report herein the case of a 75-year-old woman who underwent successful percutaneous ethanol injection therapy (PEIT) for inoperable thyroid carcinoma. The patient was admitted to our hospital for investigation of a neck tumor, and a thyroid tumor was subsequently diagnosed by ultrasonography (US) and magnetic resonance imaging (MRI). Histologic examination of an aspiration biopsy revealed findings of a papillary carcinoma. Tracheal invasion was suspected by the MRI and bronchoscopy findings. In addition, scintigraphy revealed a bone metastasis. The preoperative staging was defined as JT4, N1, and M1 (Stage IV). The patient also suffered from left hemiplegia as the result of a traffic accident. As she and her family refused an operation, PEIT was performed under local anesthesia and US imaging, following which the tumor size decreased approximately by half. The patient was discharged after this treatment and has been followed up for 13 months without any new complaints. This case demonstrates that PEIT is an effective palliative therapy for differentiated thyroid carcinoma, particularly when the surgery is not feasible.

Key words : thyroid carcinoma, percutaneous ethanol injection therapy (PEIT), ethanol, palliative therapy

Introduction

Differentiated thyroid carcinomas are slow-growing and patients generally have a good prognosis^{1,2,3)}. The most effective method of treatment for this disease is surgical ; ^{4,5)} however, patients with far advanced disease are often unable to undergo radical operations^{6,7,8)}. Nevertheless, a miserable death from suffocation can be prevented by inhibiting the growth of a neck tumor even in patients with inoperable disease⁹⁾.

Percutaneous ethanol injection therapy (PEIT) has been reported to be an effective treatment for patients with inoperable or recurrent differentiated thyroid car-

cinoma^{10,11)}. We report herein the case of a woman with inoperable differentiated thyroid carcinoma for whom PEIT was performed with a good result.

Case Report

A 75-year-old woman was admitted to Yamaguchi University Hospital for investigation of a neck tumor. US, MRI, and bronchoscopy demonstrated a thyroid tumor with suspected tracheal invasion (Fig. 1A). An aspiration biopsy was taken and cytologic examination revealed a papillary carcinoma (Fig.2). Bone scintigram showed a bone metastasis. The preoperative staging of the

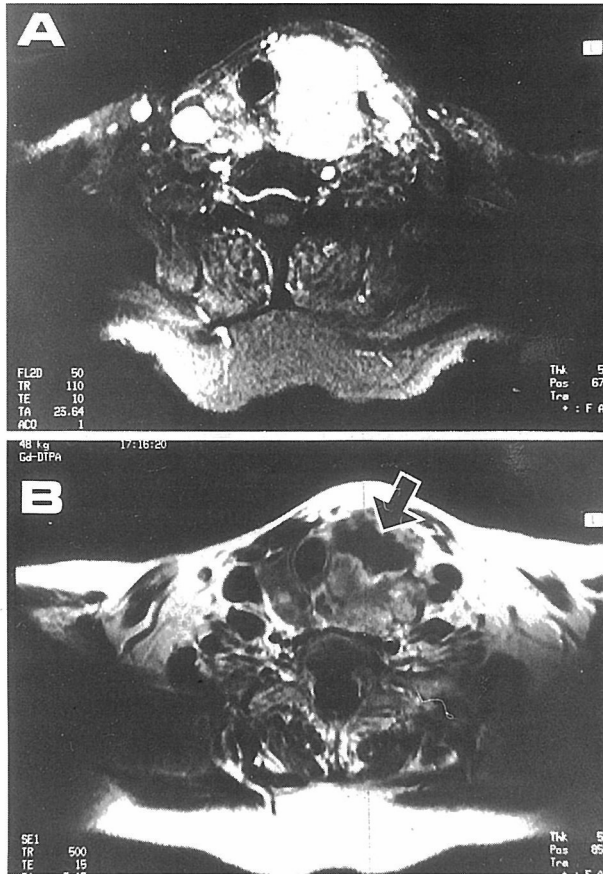


Fig. 1 MRI scan images of the thyroid. A) Before PEIT. B) 10 days after the final session. A cystic lesion (arrow) in the thyroid tumor was seen after PEIT.

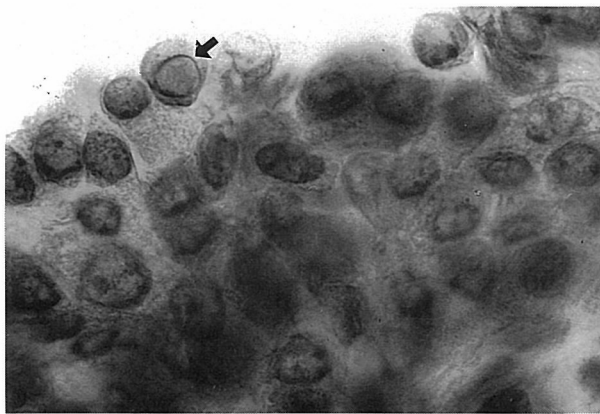


Fig. 2 Fine-needle aspiration cytology. A cluster of tumor cells show nuclear pseudostratification. The nuclei have a fine chromatin pattern and an irregular contour with creases or grooves with a prominent nucleolus. An arrow shows intranuclear pseudoinclusion. (Papanicolaou stain, $\times 1000$)

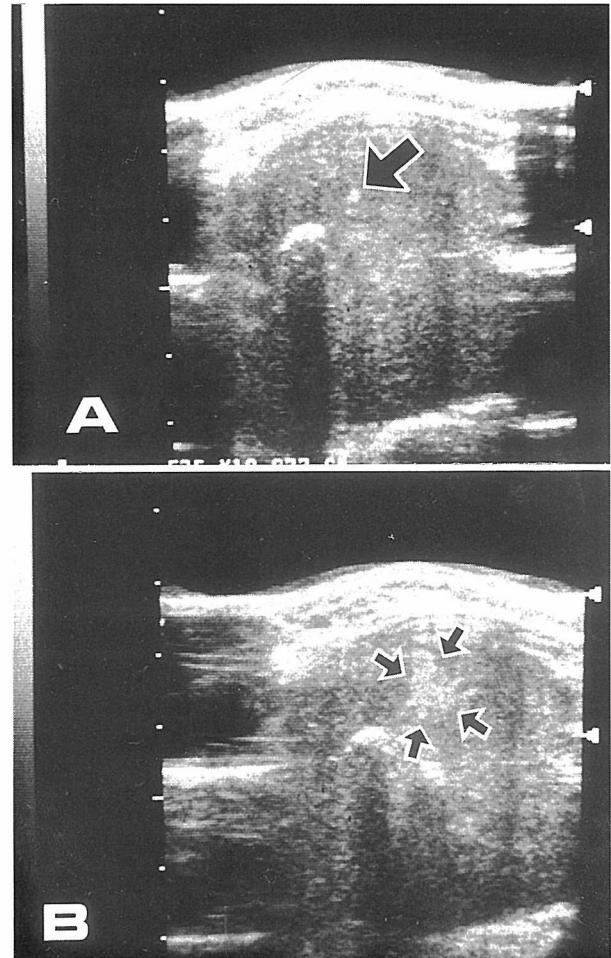


Fig. 3 (A) Ultrasound scan showing a needle tip (arrow) in the thyroid tumor. (B) Hyperechoic pattern (arrows) of the tumor after the injection of ethanol.

thyroid carcinoma was defined as JT4, N1, and M1 (Stage IV). In consideration of the additional fact that she suffered from left hemiplegia as a result of a traffic accident, both the patient and her family refused an operation. PEIT was carried out for reducing the tumor under informed consent. Under local anesthesia using 1% lidocaine and US imaging, a 22G needle was punctured into the tumor (Fig. 3A), and 99% ethanol was injected under US imaging. Ethanol from 2 to 5ml was given once. The ethanol area in the tumor was represented as a high echogenic lesion (Fig. 3B). The needle was withdrawn during an injection of 1% lidocaine. She underwent ten sessions of PEIT, following which her thyroid tumor reduced in size. Thus, the PEIT efficiency was evaluated as having achieved partial remission (PR) (Fig

1B). She was discharged and has been followed-up without any new complaints for 13 months.

Discussion

The first choice of treatment for differentiated thyroid carcinoma is surgical ; ^{4,5)} however, patients with advanced disease are often unable to undergo radical operations. Fortunately the growth of this disease is slow and it is generally associated with a relatively good prognosis^{1,2,3)}. Recently, patients with differentiated thyroid carcinoma were classified into a high risk group and a low risk group^{4,12)}. Our patient was defined as being in the high-risk group according to Cady's and Hay's classifications. As the tumor size was large, some form of treatment was required; however, the patient refused to undergo surgery and the advanced stage of the carcinoma contraindicated radical surgery. There are some forms of palliative treatment for differentiated thyroid carcinoma, such as irradiation and radioiodine therapy^{13,14)}. As tracheal compressions or invasions can occasionally lead to acute airway distress and respiratory failure⁹⁾, it was necessary to reduce the tumor size and tracheal compression in our patient.

PEIT has been employed for hepatocellular carcinoma and cystic lesions^{15,16)}. Ethanol exerts an action of dehydration and fixation for tissues and leads to necrosis ;¹⁵⁾ however, it is safe for the human body^{15,16,17)}. Recently, PEIT has also been performed for thyroid carcinoma^{10,11,17,18,19)}. The use of PEIT in the treatment of thyroid carcinoma is indicated when chemotherapy and internal or external irradiation therapy has been proven ineffective or when perioperative irradiation is contraindicated to protect the trachea, esophagus, spinal cord, or important nerves¹⁹⁾. Performing PEIT for thyroid carcinoma is technically simple because the thyroid tumor lies just under the surface of the body. The only known complications of PEIT are local pain and skin necrosis^{17,18,19)}. To prevent skin necrosis in our patient, the needle was withdrawn while injecting 1% lidocaine¹⁹⁾. We also gave our patient a diclofenac sodium suppository prior to the treatment and perfor-

med careful US imaging so that she experienced no local pain. Watanabe et al¹⁹⁾. reported achieving partial remission (PR) in 8 of 22 cases (36.4%) , while Nakada et al.¹¹⁾ reported 4 (16%) cases of complete remission and 18 (72%) cases of partial remission among 25 cases of unresectable primary or recurrent thyroid cancer by PEIT. In our patient, partial remission was achieved resulting in a better QOL than she had been experiencing prior to the treatment.

In conclusion, we reported a case of a patient who underwent PEIT for inoperable differentiated thyroid carcinoma with a good result. PEIT has been demonstrated to be safe and highly effective as palliative therapy for refractory thyroid carcinoma.

References

- 1) Vassilopoulou-Sellin R: Management of papillary thyroid cancer. *Oncology*, **9** : 145-52, 1995
- 2) Mazzaferri EL, Jhiang SM : Long-term impact of initial surgical and medical therapy on papillary and follicular thyroid cancer. *Am J Med*, **97** : 418-28, 1994
- 3) Tubiana M, Schlumberger M, Rougier P, Laplanche A, Benhamou E, Gardet P, Caillou B, Travagli JP, Parmentier C : Long-term results and prognostic factors in patients with differentiated thyroid carcinoma. *Cancer*, **55** : 794-804, 1985
- 4) Hay ID, Grant CS, Taylor WF, McConahay WM: Ipsilateral lobectomy versus bilateral lobar resection in papillary thyroid carcinoma: a retrospective analysis of surgical outcome using a novel prognostic scoring system. *Surgery*, **102** : 1088-1095, 1987
- 5) Brooks JR, Starnes HF, Brooks DC, Pelkey JN: Surgical therapy for thyroid carcinoma: a review of 1249 solitary thyroid nodules. *Surgery*, **104** : 940-946, 1988
- 6) Robbins J, Merino MJ, Boice JD Jr., Ron E, Ain KB, Alexander R, Norton JA, Reynolds J: Thyroid cancer: a lethal endocrine neoplasm. *Ann Intern Med*, **115** : 133-147, 1991
- 7) Akslen LA, Hakdirseb T, Thoresen SO,

- Glattre E: Survival and causes of death in thyroid cancer: a population-based study of 2479 cases from Norway. *Cancer Res*, **51** : 1234-1241, 1991
- 8) Carcangiu ML, Zampi G, Pupi A, Castagnoli A, Rosai J: Papillary carcinoma of the thyroid. a clinicopathologic study of 241 cases treated at the University of Florence. *Cancer*, **55** : 805-828, 1985
- 9) Shaha A, Alfonso A, Jaffe BM: Acute airway distress due to thyroid pathology. *Surgery*, **102** : 1068-1074, 1987
- 10) Goletti O, Lenziardi M, De Negri F, Fiorini I, Lippolis PV, Cristofani E, Di Coscio G, Seccia M, Cavina E: Inoperable thyroid carcinoma: palliation with percutaneous injection of ethanol. *Eur J Surg*, **159** : 639-641, 1993
- 11) Nakada K, Kasai K, Watanabe Y, Katoh C, Kanegae K, Tsukamoto E, Itoh K, Tamaki N: Treatment of radioiodine-negative bone metastasis from papillary thyroid carcinoma with percutaneous ethanol injection therapy. *Ann Nucl Med*, **10** : 441-444, 1996
- 12) Cady B, Sedgwick CE, Meissner WA, Bookwalter JR, Romagosa V, Werber J: Changing clinical, pathologic, therapeutic, and survival patterns in differentiated thyroid carcinoma. *Ann Surg*, **184** : 541-553, 1976
- 13) Farahati J, Reiners C, Stuschke M, Muller SP, Stuben G, Sauerwein W, Sack H : Differentiated thyroid cancer impact of adjuvant external radiotherapy in patients with perithyroidal tumor infiltration (stage pT4) . *Cancer*, **77** : 172-180, 1996
- 14) Pochin EE : Radioiodine therapy of thyroid cancer. *Semin Nucl Med*, **1** : 503-515, 1971
- 15) Shinagawa T, Ukaji H, Iino Y, Isomura S, Yamaguchi H, Ishizuka S, Sugiura N, Ohto M: Intratumoral injection of absolute ethanol under ultrasound imaging for treatment of small hepatocellular carcinoma. attempts in three cases. *Acta Hepatologica Japonica*, **26** : 99-105, 1985
- 16) Bean WJ : Renal cysts: treatment with alcohol. *Radiology* **138** : 329-331, 1981
- 17) Yamauchi T, Noguchi S, Murakami N, Yamaguchi K, Imura M, Taniguchi M : An ethanol injection therapy for tumors of inoperable patients with a differentiated thyroid carcinoma. *Jpn J Cancer Clinics*, **37** : 1035-1038, 1991
- 18) Ishihara T, Hattori N, Hino M, Moritera K, Ikekubo K, Kurahachi H, Mori T : A case of huge thyroid papillary carcinoma successfully treated with local ethanol injection. *Clinical Endocrinol*, **39** : 1293-1296, 1991
- 19) Watanabe S, Noguchi S, Murakami N, Ninomiya T, Ochiai E: Ethanol injection therapy for non-curative thyroid cancer. *Geka (Surgery)*, **58** : 695-700, 1996