

Intrathoracic Benign Goiter Imaged by ^{18}F -FDG-PET

A Case Report

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Abstract: A 55-year-old woman was referred for a suspicion of mediastinal tumor through plain X-ray photography (X-P). Magnetic resonance imaging (MRI) revealed a 3 cm diameter tumor which seemed to connect to the thyroid and projected into the mediastinum. A fine needle aspiration biopsy was tried but could not reach a conclusive diagnosis. Thereby, fluorine-18-fluorodeoxyglucose positron emission tomography (^{18}F -FDG-PET) was performed and a high accumulation was revealed with standardized uptake value (SUV) of 3.8. Thus, the right lobe excision procedure was enforced. The obtained tumor was continuous to the right lobe as expected. Microscopically, the encapsulated tumor consisted of atypical large-sized follicles without malignant characteristics. Thus, histological diagnosis was follicular thyroid adenoma.

Thus, follicular adenoma of thyroid could present negative iodine-123-radioisotope (^{123}I -RI) uptake and positive ^{18}F -FDG-PET accumulation.

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Abbreviations: ^{123}I -RI = iodine-123-radioisotope, ^{18}F -FDG-PET = fluorine-18-fluorodeoxyglucose positron emission tomography, MRI = magnetic resonance imaging, SUV = standardized uptake value, X-P = X-ray photography.

INTRODUCTION

Most cases of intrathoracic goiter are asymptomatic and are discovered at chest radiography by chance. It is difficult to gain a definite diagnosis for malignancy by magnetic

resonance imaging (MRI) and iodine-123-radioisotope (^{123}I -RI). Then fluorine-18-fluorodeoxyglucose positron emission tomography (^{18}F -FDG-PET) is expected to be useful in this issue but the specificity is not always clear. We experienced a case of intrathoracic benign goiter which showed high uptake of ^{18}F -FDG-PET.

CASE REPORT

A 55-year-old woman was referred to our hospital because of a suspicion of mediastinal tumor incidentally found through a medical-checkup plain X-ray photography (X-P) (Figure 1A). Chest MRI revealed a 3 cm diameter tumor which seemed to connect to the right lobe of thyroid and projected into the mediastinum (Figure 1B). By ^{123}I -RI, no unusual accumulation was detected (Figure 1C). A fine needle aspiration biopsy, which is viewed as the “gold standard” for diagnosis in most cases, was tried but could not reach a conclusive diagnosis. Thereby, ^{18}F -FDG-PET was performed and a high accumulation was revealed with standardized uptake value (SUV) of 3.8 (Figure 1D).

Thus, as a possibility of malignancy could not be excluded, the right lobe excision procedure for thyroid gland was enforced. The obtained tumor was continuous to the right lobe as expected. The surface was flat and smooth and the exfoliation from the circumference organization was easy (Figure 2A). Microscopically, the encapsulated tumor consisted of atypical large-sized follicles without malignant characteristics, the background thyroid tissue showing no remarkable change (Figure 2B). Thus, histological diagnosis was follicular thyroid adenoma.

Ethical approval was not thought to be necessary because all the clinical course of the case was completely within usual medical cares. Informed consent was given from the case on each occasion of diagnostic examinations and therapeutic procedures.

DISCUSSION

Mediastinal tumor is an uncommon entity of intrathoracic tumors. Especially, intrathoracic goiter is a rare condition.¹ In the early years of applying ^{18}F -FDG-PET for the differentiation of thyroid nodule malignancy, high sensitivity, and selectivity was reported by SUV values.^{2,3} However, recent reports did not confirm the high selectivity by SUV (40–60%).^{4,5} Thus, follicular adenoma of thyroid could present negative ^{123}I -RI uptake and positive ^{18}F -FDG-PET accumulation.

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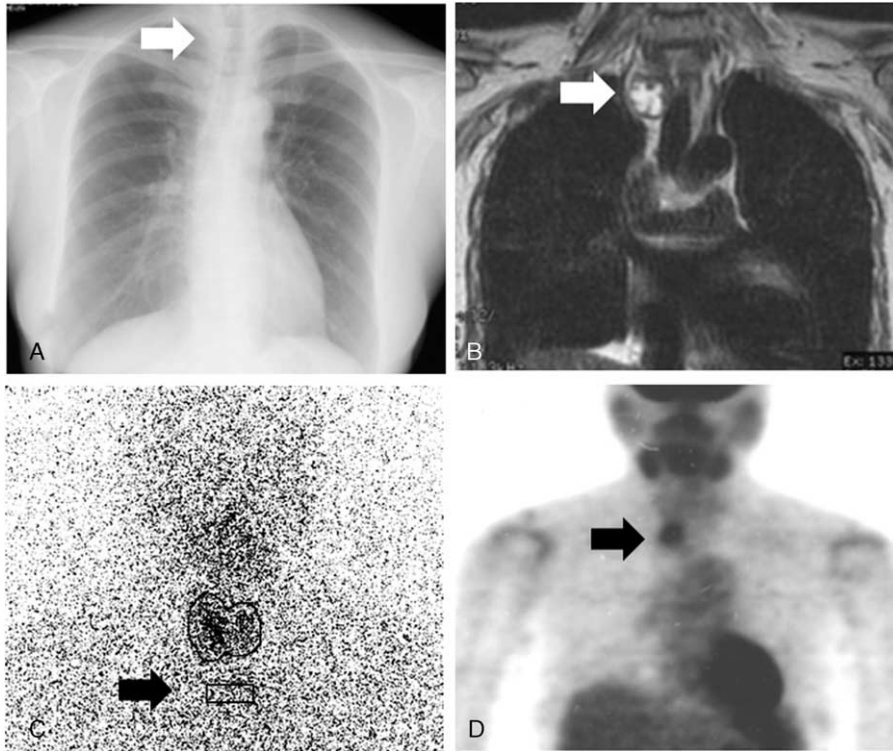


FIGURE 1. An oppression of trachea revealed by plain X-P (Panel A). A 3 cm diameter tumor which seemed to connect to the right lobe by MRI (Panel B). No unusual accumulation by ^{123}I -RI (Panel C). A high accumulation with SUV of 3.8 by ^{18}F -FDG-PET (Panel D).

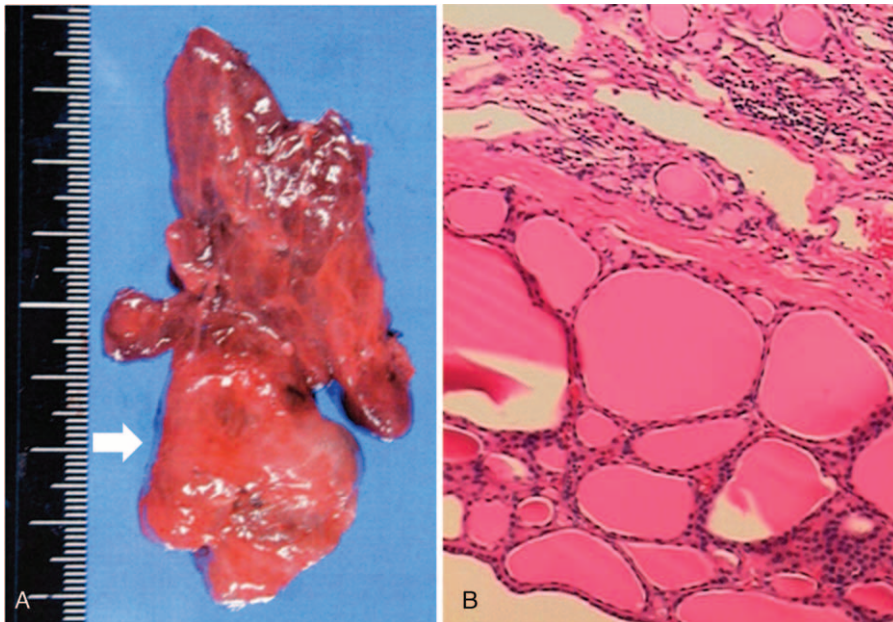


FIGURE 2. Flat and smooth surface of the tumor connected to the right thyroid lobe (Panel A). Atypical large-sized follicles without malignant characteristics and the background thyroid tissue showing no remarkable change (Panel B).

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