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## Case report

# A case of the accumulation of 131-iodine in the mammary gland after remnant ablation for papillary thyroid carcinoma on lactating period <sup>☆</sup>

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## ABSTRACT

The accumulation of 131-iodine is known to occur in the extrathyroidal tissues, such as the salivary glands and the gastrointestinal tract during radioactive iodine therapy. It is considered to be due to the expression of sodium iodide symporter. A 36-year-old lactating female was treated for remnant ablation for papillary thyroid carcinoma (pT1bN1bM0 pStage I) on the condition that she refrained from breastfeeding and was separated from her child and was milked to promote the excretion of 131-iodine until the accumulation disappeared on scintigram imaging. Scintigram showed the decrease and disappearance of the 131-iodine accumulation and the external dose rate was measured and confirmed to have decreased on the day 7 and 14 after the treatment. In conclusion, remnant ablation may be available by milking and separation from the child for 7 to 14 days.

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## Introduction

The accumulation of 131-iodine is known to occur in the extrathyroidal tissues, such as the salivary glands and the gastrointestinal tract during radioactive iodine (RAI) therapy. It is considered to be due to the expression of sodium iodide symporter (NIS)[1]. We herein report a case of 131-iodine breast uptake after remnant ablation for papillary thyroid carcinoma (PTC) in lactating period.

## Case report

A 36-year-old female without any past medical history underwent a total thyroidectomy and bilateral neck dissection for PTC (pT1bN1bM0 pStage I). The preoperative blood examination showed a thyroglobulin (Tg) level of 362 ng/mL (The normal value of Tg is 33.7 ng/mL or less). Five months after surgery, although she was lactating, remnant ablation (131-iodine, 1,110 MBq) was performed on condition that she re-

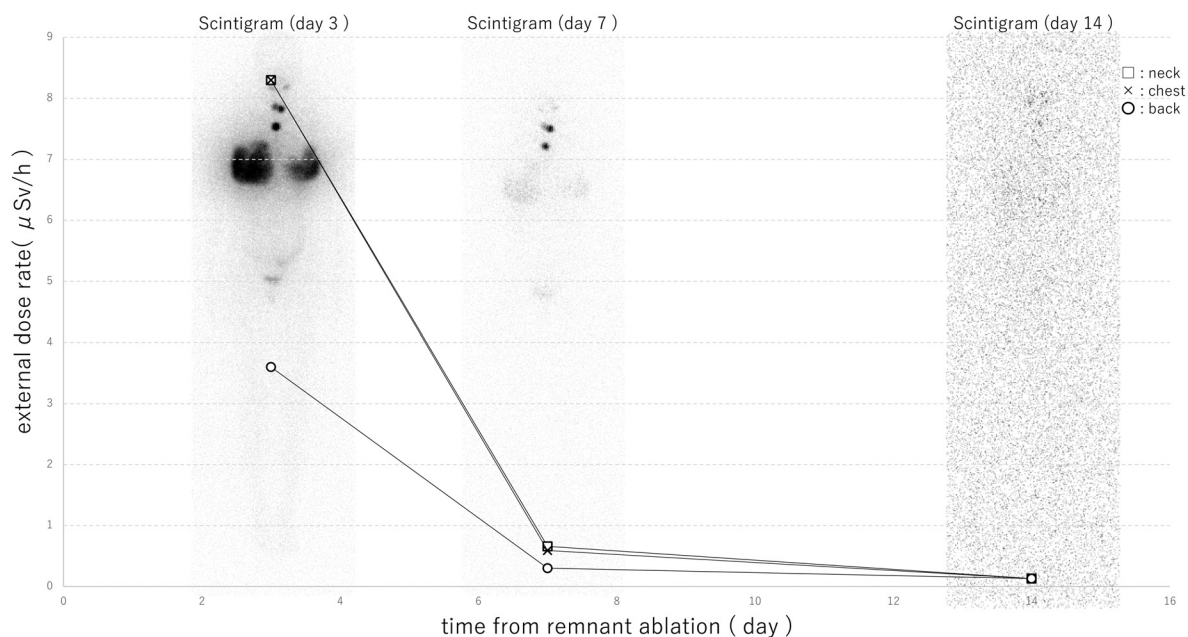
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**Fig. 1 – Change of external dose rate at 0.5m (sv/h), and 131-iodine scintigraphy. The scintigram on the day 3 showed the marked accumulation in the thyroid bed, the superior mediastinum, and bilateral mammary glands, and the decrease and the disappearance of accumulation on the day 7 and 14. The external dose rate decreased markedly on the day 7 and 14.**

frained from breastfeeding and was separated from her child until the 131-iodine accumulation disappeared on scintigram imaging. To promote the excretion of 131-iodine, milking was done daily after remnant ablation was performed. After remnant ablation, scintigraphy and dosimetry was performed on the day 3, 7, and 14 to determine whether to remove the separation from her child. On the day 1, milking was done and the external dose rate of milk at 0.2 m was 9.79  $\mu\text{Sv/h}$  and the effective dose was 7.986 MBq (110mL of milk). Scintigraphy on the day 3 showed the marked accumulation in the thyroid bed, the superior mediastinum, and bilateral mammary glands, and the decrease and the disappearance of the accumulation on the day 7 and 14. The external dose rate markedly decreased on the day 7 and 14. Three years after remnant ablation, no symptoms, such as mastitis, were observed, and no neoplastic lesions in the mammary gland observed. As for PTC, Tg was 0.07 ng/mL under thyroid-stimulating hormone suppression, and no recurrence was observed.

## Discussion

The accumulation of 131-iodine in the organs, such as the salivary glands, the gastrointestinal tracts, and the thyroid bed is known to occur during RAI therapy, and it is reported that NIS expresses in these organs [1]. In this context, R. Bruno et al. described that the accumulation of 131-iodine in the mammary gland during RAI therapy is about 1.3% [1]. It is speculated that the prolactin may lead to high expression of NIS in the mammary gland, resulting in elevating uptake of 131-iodine [2],[3]. Bakheet et al. reported 12 cases of the

131-iodine accumulation in the mammary gland during lactation and classified the accumulation patterns in four different categories [4]. The 4 patterns of accumulation were, “full,” “focal,” “crescent,” and “irregular,” and the difference in the distribution of the 131-iodine accumulation may be caused by the difference between prolactin-stimulated and non-stimulated mammary gland tissues that frequently expresses NIS.

Except for lactation, there have been several reports that described the 131-iodine accumulation in the cases of breast cancer, hyperprolactinemia, hyperprolactinemia due to side effects of anti-dopaminergic drugs (eg, bromocriptine, risperidone)[1],[3],[5, 6]. It is suggested that when 131-iodine accumulation in the mammary gland is observed, we should also consider the lactation period, breast cancer, hyperprolactinemia and side effects of anti-dopaminergic drugs.

In the present case, remnant ablation was performed on the condition that she was separated from her child after the treatment until the 131-iodine accumulation disappeared on scintigram imaging. Following the guidelines issued by the American Thyroid Association, breastfeeding was discontinued after remnant ablation [7]. Although the guidelines recommend discontinuing breastfeeding at least 6 weeks prior to RAI therapy, we determined that daily milking after remnant ablation would allow for the removal of 131-iodine [7].

A unique feature of the present case is that not only was the decrease or disappearance of the accumulation showed by scintigram on the day 7 and 14 after remnant ablation, but also the external dose rate was measured and confirmed to have decreased. As shown in the Figure 1, it can be seen that the external dose rate and the 131-iodine accumulation was drastically reduced by daily milking.

In conclusion, remnant ablation may be available by milking and separation from the child for 7 to 14 days.

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### Patient consent statement

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

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