LETTER TO EDITOR

Lingual Thyroid - A Lesson to Learn

C S Ng, MRCP, M S Mohd. Razak

Nuclear Medicine Unit, Hospital Sultanah Aminah, Johor Bahru

Sir,

We wish to highlight a few important points from a nuclear medicine perspective in the case report on "Lingual Thyroid – A Lesson to Learn" which appears in the Med J Malaysia Vol 59 No 4 October 2004 issue.

In this article, radioiodine (^{123}I) scan was done following CT (presumably with contrast) and selective carotid angiography. Unfortunately, the dates of the above procedures and the aftermath timing of FT4 and TSH were not mentioned. It is well known that radiographic iodine-contrast agents can inhibit radioactive iodine uptake. Thyroid hormone production might have been at least transiently inhibited (the Wolff-Chaikoff effect) after the effect of iodinated contrast agents. The effect may last from few weeks to several months. However, in a few apparently normal individuals, in newborns and fetuses and in some predisposed individuals, the 'escape' from the inhibitory effect of large doses of iodides is not achieved and longer-term hypothyroidism can occur. As a consequence, even with a high background of TSH, possibility of a false negative radioiodine (^{123}I) scan cannot be ruled out. Clinicians should be aware that radioiodine scan for detection of iodine-avid thyroid tissue should be done before any radiological procedures where contrast iodine are used. However, it will not be surprising to find that the resected lingual thyroid was after all, the only thyroid gland present in this patient. Over 70% of patients with grossly evident lingual thyroid have no normal thyroid gland.

^{99m}Tc, ^{123}I and ^{131}I are the three types of radionuclide used for thyroid imaging. Iodine-123 (^{123}I) has a 13.3 hour half-life and its other physical properties provide excellent images and low radiation absorbed dose when compared to ^{131}I, whereas its localization is more specific than pertechnetate ($^{99m}TcO_4$) for functional thyroid imaging.

Iodine-123 is usually produced in a cyclotron. Earlier method tended to produce a product with significant amounts of long-lived ^{125}I and ^{124}I as radio-contaminants. With increase availability of cyclotron of higher energy accelerators, it is possible to produce ^{123}I of higher purity with no ^{124}I contamination but some ^{125}I may still exist (<0.1%). Because ^{123}I decays much faster than these radiochemical impurities, these contaminants are therefore relatively long-lived. Their proportion in an ^{123}I preparation increases with time. As a result, if thyroid scan using ^{123}I is done a day after the supposed scheduled time, the patient's radiation dose would be considerably increased (i.e., tripled) for comparable scan statistics. The expiration time set by the suppliers is usually around 30 hours from the time of production.

As there is no cyclotron available here in Malaysia, the short half-life of ^{123}I contributes to the high cost, problems with availability and delivery from oversea. We are curious to know the source of supply at the authors' institution as we have yet to find one capable of providing this radionuclide within an acceptable timing and with good radiochemical purity.

References

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2. Michael A. Wilson (ed). Textbook of Nuclear Medicine. Lippincott-Raven Publishers 1997: 401-02.