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Case report

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Rapidly vanishing hyperthyroidism

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Case 1

A 37-year-old lady known for Graves' disease with persistent hyperthyroidism had been deliberately treated and prepared for planned thyroidectomy with oral iodine (10 mg daily for 5 days), resulting in normal fT4 (free T4) levels before surgery (Figure 1, Patient 1).

Case 2

A few months later, a 38-year-old lady was admitted to our hospital with symptoms and signs suggestive of acute appendicitis, and laparoscopic emergency surgery was performed. Due to symptoms typical for hyperthyroidism (weight loss of 6 kg, sleeplessness, increased perspiration) that had been present for 4 months, thyroid hormones were checked. Indeed, TSH was suppressed, and fT4 was >100 pmol/l (normal range 12.3–20.2 pmol/l) immediately before and still 98.2 pmol/l 1 day after surgery. The patient was discharged from the hospital and seen 3 days later as an outpatient at the division of endocrinology for further diagnostic evaluation and treatment of hyperthyroidism. At this time, the diagnosis of Graves' disease was made; TSH receptor antibodies were detected. However, since fT4 had dropped to 28.8 pmol/l, it was decided to observe the clinical course and at Day 12 after surgery, fT4 was 15.2 pmol/l. One week later (Day 18 after surgery), fT4 level was >100 pmol/l again. Therapy with carbimazole was started and possible causes of the transient remission of thyrotoxicosis were discussed.

When plotting the fT4 concentration against time (Figure 1, Patient 2), a striking resemblance to the course of Patient 1 appeared, thus suggesting iodine contamination. The only potential source of excessive iodine that could be identified was disinfection of the patient's intact skin (abdomen) with 200 ml of 10% Povidone-Iodine (Betadine®) prior to the appendectomy as well as disinfection of the three trocar entry incisions after closure of the abdominal wall fascia with 5 ml of the same substance.

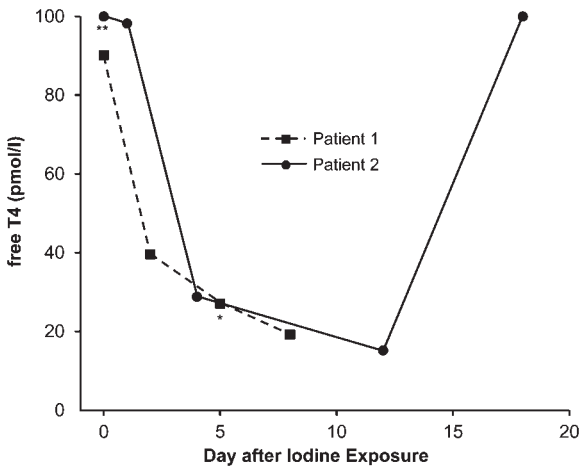

Figure 1. Time course of free T4 in two patients suffering from Graves' disease, one with deliberate exposure to iodine before thyroid surgery (Patient 1, squares) at time point 0, and one undergoing laparoscopic surgery with accidental iodine exposure (Patient 2, circles). Asterisk indicates the time of thyroidectomy in Patient 1, double asterisks indicate the time of appendectomy in Patient 2.

Discussion

Thyroid hormone production is inhibited by acute iodine excess, but resumes after a few days even if the iodine excess persists ('escape').[1] The initial inhibitory effect has been used for the preoperative treatment of Graves' disease for many years.[2] The case with accidental exposure to Povidone-Iodine (Betadine®) during appendectomy described here did not undergo thyroid surgery, and hyperthyroidism recurred. Of interest, topical iodine exposure by means of an apparently minimal single dose was limited to the intact skin and the incisions made for the three trocars during laparoscopic surgery, resulting in the classical sequence of thyroid hormone changes similar to that observed in patients who are deliberately treated with iodine.

Hyperthyroidism may occasionally follow the administration of iodine-containing radiocontrast agents to subjects with multinodular goiter but euthyroidism or subclinical hyperthyroidism at baseline.[3] Transient control and remission of pre-existing hyperthyroidism is another potential response to excessive iodine exposure and may be observed incidentally, as illustrated by our unique second case, undergoing abdominal rather than planned thyroid surgery.

Conflict of interest: None declared.

References

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