Case Report

Taste disorder in a patient with invasive thymoma without myasthenia gravis: a rare case report

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Abstract: Taste disorder has been reported as a non-motor symptom caused by myasthenia gravis (MG)-related autoimmune mechanism. Taste disorder in some cases recovered along with MG treatment, such as thymothymectomy or immunosuppressive treatment. However, symptom of taste disorder in thymoma patients without MG is very rare. Here, we reported a case of invasive thymoma without MG which had concurrent taste disorder. The taste disorder was successfully treated with cyclosporine. A female in her seventies had an anterior mediastinal tumor of 78-mm in diameter and pleural dissemination. She also had taste disorder, limited to sweet taste, and pure red cell aplasia (PRCA). Symptoms and physical findings showed no feature of MG. Pre-operative blood examination revealed no elevation of anti-acetylcholine receptor antibody . Extended total thymothymectomy and resection of all detectable pleural disseminations was performed. Pathological examination showed type B3 thymoma. Clinical stage was Masaoka stage IVa. After operation, there was no improvement in taste disorder and PRCA. Six months after operation, cyclosporine was administered for PRCA. In parallel with gradual improvement of anemia, taste disorder also gradually improved. Three months after the first administration of cyclosporine, taste disorder had completely recovered. This is the first case of taste disorder without any myasthenic status, which recovered with immunosuppressive drug. Our case suggested the potency of immunosuppressive treatment for taste disorder associate with thymoma without MG.

Keywords: Thymoma; taste disorder; myasthenia gravis (MG); cyclosporine; case report

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Introduction

Taste disorder has been reported as a non-motor symptom caused by myasthenia gravis (MG)-related autoimmune mechanism, which is seen in about 5% of MG cases (1). These patients commonly have thymoma and is associated with severe MG. Taste disorders might be induced by undetermined antibodies associated with thymoma and targeted on taste buds, as for MG. Taste disorder sometimes recovered along with MG treatment, such as thymothymectomy, immunosuppressive treatment. However, symptom of taste disorder in thymoma patients

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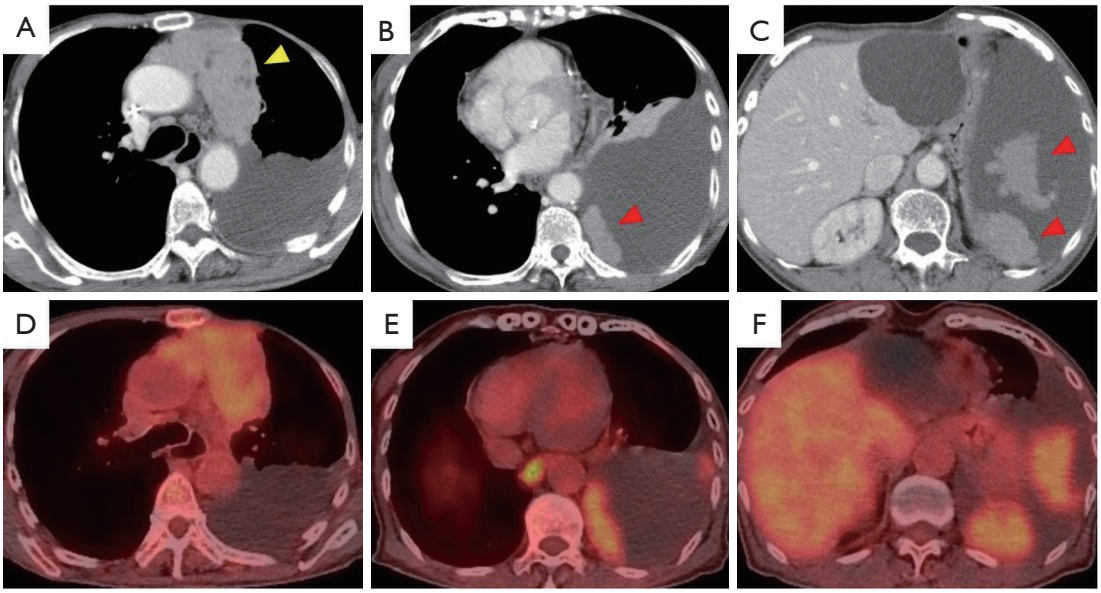

Figure 1 Radiological images. (A-C) Chest CT examination revealed an anterior mediastinal tumor of 78-mm diameter (yellow arrowhead), multiple dissemination (red arrowhead), and left pleural effusion. (D-F) ^{18}F-fluorodeoxyglucose positron emission tomography scan showed moderate metabolic activity of mediastinal tumor and multiple dissemination (the maximum standard uptake value 3.85). CT, computed tomography.

without MG is very rare. Here, we reported a case of invasive thymoma without MG which had concurrent taste disorder. The taste disorder was successfully treated with cyclosporine. We present the following case in accordance with the CARE reporting checklist (available at https://med.amegroups.com/article/view/10.21037/med-21-28/rc).

Case presentation

A female in her seventies visited a local hospital for difficulty swallowing. Upper gastrointestinal endoscopic examination revealed severe esophageal ulcer. In addition, chest computed tomography (CT) examination revealed an anterior mediastinal tumor of 78-mm in diameter and left pleural effusion. She was referred to our hospital. She had a past history of chronic anemia for several decades, chronic thyroiditis, osteoporosis, and left mastectomy for breast cancer in her forties. She also had taste disorder, limited to sweet taste, for five years. She was previously examined by several otorhinolaryngologists but the cause of taste disorder remained unknown. Symptoms and physical findings showed no feature of MG. Pre-operative blood examination revealed moderate anemia; hemoglobin 8.2 g/dL (normal, 11.8–15.1 g/dL) and no elevation of anti-acetylcholine receptor antibody (AChRAb). Contrast-enhanced CT revealed multiple pleural nodules in addition to the anterior mediastinal tumor. CT guided-biopsy revealed type B2 thymoma. Clinical stage was Masaoka stage IVa because of pleural dissemination (*Figure 1*). Bone marrow biopsy revealed pure red cell aplasia (PRCA). Taste disorder and PRCA were thought to be thymoma-associated symptoms. However, the cause of severe esophageal ulcer were undetected even if biopsy was done. We decided to perform radical operation for primary thymoma and pleural dissemination.

Extended total thymothymectomy, combined resection of left upper lobe, phrenic nerve, and pericardium, and resection of all detectable pleural disseminations was performed. Pathological examination showed type B3 thymoma (dominant B3 with B2) (*Figure 2*).

After operation, there was no improvement in taste disorder, PRCA, and severe esophageal ulcer. Six months after operation, cyclosporine was administered 150 mg per day for PRCA. In parallel with gradual improvement of anemia, taste disorder also gradually improved. Three months after the first administration of cyclosporine, taste disorder had completely recovered. There was no improvement in esophageal ulcer. She has no recurrence of

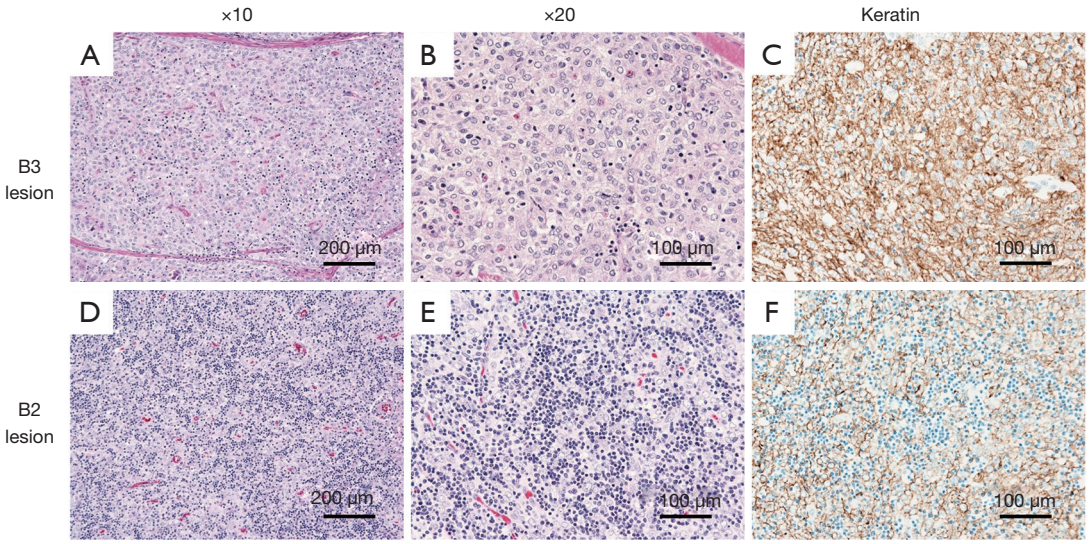

Figure 2 Histological images. (A-C) Sheet like structure of epithelial cells positive staining for keratin with small amount of lymphocyte revealed type B3 thymoma. (D-F) Small alveolar structure of epithelial cells positive staining for keratin with many amount of lymphocyte revealed type B2 thymoma. Staining methods: HE for (A,B,D,E) and keratin for (C,F). Scale bar: 200 μm for (A,D), and 100 μm for (B,C,E,F).

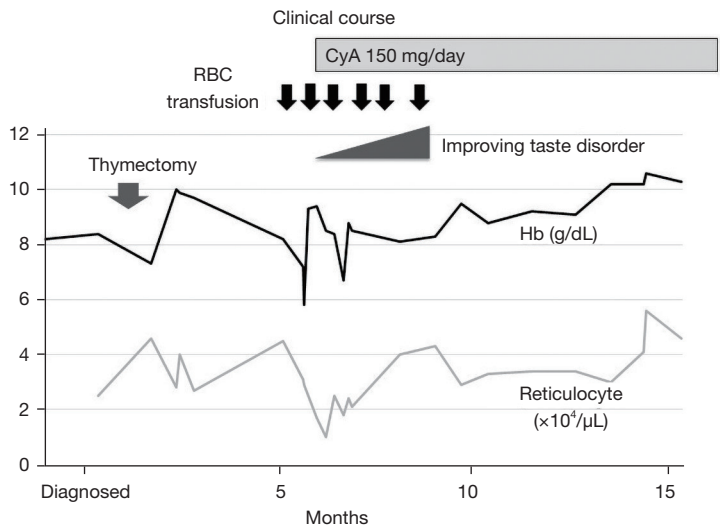

Figure 3 Timeline of clinical course.

thymoma for three years. Administration of cyclosporine was continued and symptoms of anemia and taste disorder remained stable (*Figure 3*). All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

We presented here a very rare case of taste disorder in a thymoma patient without MG. To the best of our knowledge, this is the second report of such patient. In the

previous case, taste disorder improved by thymothymectomy alone (2). The pre-operative AChRAb in that case was elevated, thus taste disorder might have been associated with myasthenic status. Our patient is the first case of taste disorder without any myasthenic status, which recovered with immunosuppressive drug.

Taste disorder, especially sweet taste, has been reported as a non-motor symptom caused by MG-related autoimmune mechanisms. Because G-protein-coupled receptor (GPCR) cells are responsible for sweet within the taste buds, the selective sweet taste disorder in MG suggests dysfunction in GPCR-containing receptor cells (3). In a multicenter study, taste disorders were observed in 4.3% of the patients with MG and 2.4% of its were associated with MG itself (1). All patients in their multicenter study had thymoma with seropositivity for AChRAb. Taste disorder sometimes recovered along with MG treatment (3,4). Thymectomy is a treatment option for MG (5). However, the effect of thymectomy for treatment of taste disorder itself is unknown because taste disorder without MG is very rare. Taste disorder in our case did not recover with thymothymectomy alone.

PRCA is a rare paraneoplastic syndrome of thymoma and characterized by a low reticulocyte count, marked reduction or absence of erythroid precursors from the bone marrow. Whereas the frequency of PRCA is rare in thymoma patients (2–5%), a significant portion of PRCA (8.5–50%) has been associated with thymoma (6). Whereas surgical resection of the thymoma associated with PRCA has been recommended as the initial treatment, recent study revealed low remission rate with thymothymectomy alone (6,7). Immunosuppressive treatment such as cyclosporine and maintenance therapy induced an effective response in patients with PRCA associated with thymoma (6,8). PRCA in our patient did not recover with thymothymectomy alone but have could be controlled by maintenance treatment with cyclosporine. Taste disorder also recovered after administration of cyclosporine. There have been no previous report of combined treatment of PRCA and taste disorder. In addition, there have been no data of immunosuppressive treatment for taste disorder without MG. Chabwine *et al.* reported a case of taste disorder in a patient with thymoma-associated MG, which was treated with immunosuppressive drug and thymothymectomy (3). Their results suggested the coexistence of an autoantibody selectively targeting GPCRS and that immunosuppressive drug could inhibit the autoantibody. Our case showed the potency of immunosuppressive treatment for taste disorder associate with thymoma.

To the best of our knowledge, there have been no report about the association of severe esophageal ulcer and thymoma. Unlike PRCA and taste disorder, esophageal ulcer did not recover after thymothymectomy and administration of cyclosporine. Esophageal ulcer might be independent from thymoma, but it could have been a paraneoplastic syndrome. More case reports are required for further discussion.

In conclusion, we presented a very rare case of taste disorder in a thymoma patient without MG which was recovered after immunosuppressive treatment. Our case suggested the potency of immunosuppressive treatment for taste disorder associate with thymoma without MG. It is meaningful to treat taste disorder itself because taste disorders disturb the quality of life of patient. Further pharmacological study about mechanism of immunosuppressive drug for the treatment of taste disorder is required.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://med.amegroups.com/article/view/10.21037/med-21-28/rc

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://med.amegroups.com/article/view/10.21037/med-21-28/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the

patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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