Good Syndrome with Cytomegalovirus Hepatitis: Successful Resection of Thymoma: A case report

CURRENT STATUS: UNDER REVIEW

Journal of Cardiothoracic Surgery • BMC

Sho Isobe
Toho University

Atsushi Sano
Toho University

ORCiD: 0000-0002-4604-9024

Hajime Otsuka
Toho University

Yoko Azuma
Toho University

Satoshi Koezuka
Toho University

Takashi Makino
Toho University

Takashi Sakai
Toho University

Takafumi Ito
Toho University

Tadashi Maeda
Toho University

Sakae Homma
Toho University

Akira Iyoda aiyoda@med.toho-u.ac.jp
Corresponding Author
ORCiD: 0000-0002-0908-4840

DOI: 10.21203/rs.2.23143/v1

SUBJECT AREAS
Cardiothoracic Surgery

KEYWORDS

Good syndrome, thymoma, cytomegalovirus hepatitis, thymectomy
Abstract

Background Good syndrome is a rare condition, manifesting as immunodeficiency due to hypogammaglobulinemia associated with thymoma. Herein, we present a patient with Good syndrome whose thymoma was resected after treatment of cytomegalovirus hepatitis.

Case presentation The patient was a 45-year-old woman presenting with fever, cough, and nasal discharge, and was diagnosed with thymoma and hypogammaglobulinemia. She subsequently developed cytomegalovirus hepatitis that was treated by immunoglobulin. After resolution of the hepatitis, she underwent thymectomy through a left anterior thoracotomy. Her postoperative course was uneventful, and while receiving ongoing immunoglobulin therapy, she has been doing well without signs of infection.

Conclusions Management of infections is important for patients with Good syndrome. To minimize the risk of perioperative infection, we should take care while planning the surgical approach and procedure.

Background

Good syndrome, the condition of adult-onset immunodeficiency associated with thymoma, is quite rare, occurring in only 0.2%-6% of thymoma patients [1,2]. Patients with typical Good syndrome show hypogammaglobulinemia and B-cell depletion. Preventing infection improves the prognosis of patients with Good syndrome, and repeated gamma globulin therapy is considered necessary [3,4]. Herein, we report a patient with Good syndrome who underwent successful resection of her thymoma through a left anterior thoracotomy and received preoperative gamma globulin therapy subsequent to treatment for preoperative cytomegalovirus hepatitis.

Case Presentation
The patient was a 45-year-old woman who was referred to a nearby clinic for fever of 38°C, cough, and nasal discharge. Although she was treated with antibiotics, her signs were not improved. Chest X-ray and computed tomography showed a 61×45-mm anterior mediastinal tumor (Fig. 1). Positron emission tomography scan showed 1.8-fold greater uptake than the maximal standardized uptake value in the tumor. A blood test revealed a serum immunoglobulin G level of 239 mg/dL (normal range 870-1700 mg/dL), serum immunoglobulin A level of 24 mg/dL (normal range 110-410 mg/dL), and a serum immunoglobulin M level of 26 mg/dL (normal range 46-260 mg/dL). She was referred to our hospital for further examination and treatment for the anterior mediastinal tumor and hypogammaglobulinemia. The histopathological diagnosis of a CT-guided biopsy specimen was type AB thymoma based on the World Health Organization classification, leading to the diagnosis of Good syndrome.

While undergoing diagnostic workup, the patient developed sudden deafness that was treated by corticosteroids. She then became febrile with worsening liver function, showing a serum aspartate aminotransferase level of 127 U/L and a serum alanine aminotransferase level of 132 U/L. She developed serum cytomegalovirus antigenemia, and altogether, the findings were diagnosed as cytomegalovirus hepatitis due to hypogammaglobulinemia. She received 15 g of immunoglobulin and ganciclovir with subsequent improvement in her liver function, with normal serum levels of aspartate aminotransferase and alanine aminotransferase. Her serum cytomegalovirus antigenemia was undetectable 2 weeks after initiation of antiviral therapy.

After her cytomegalovirus hepatitis improved, the patient underwent surgical resection for thymoma. Because she was immunocompromised, we performed a left anterior thoracotomy instead of a median sternotomy to minimize the risk of a perioperative infection. We administered immunoglobulin twice before surgery, and thymectomy was
performed 3 months after the diagnosis of cytomegalovirus hepatitis (Fig. 2). The postoperative course was uneventful without signs of infection, and the patient was discharged 10 days after the surgery.

The patient remains alive without recurrence of thymoma. Her hypogammaglobulinemia has persisted, and she has undergone regular administration of immunoglobulin therapy (Fig. 3). She has not developed signs of infection since the immunoglobulin therapy was initiated.

**Discussion**

Good syndrome is characterized as a combination of thymoma and hypogammaglobulinemia. In patients with Good syndrome, hypogammaglobulinemia often results in bacterial and viral infections, which are sometimes fatal [3,4]. Therefore, the control of infection is important in patients with Good syndrome.

Bacterial infections are the most frequent in patients with the Good syndrome, followed by viral infections, with cytomegalovirus infection being the most frequent viral infection [4]. Cytomegalovirus duodenoenteritis and retinitis have been reported in patients with Good syndrome [5,6]. According to these previous reports, ganciclovir was an effective treatment.

To the best of our knowledge, this is the first report of cytomegalovirus hepatitis in a patient with Good syndrome. Cytomegalovirus hepatitis sometimes occurs in immunodeficient patients with human immunodeficiency virus infection or undergoing organ transplantation. Cytomegalovirus infection can relapse after improvement due to ganciclovir treatment, if the patient’s immunodeficiency worsens. Therefore, we administered immunoglobulin therapy before and after the patient’s thymectomy to prevent relapse of hepatitis during the perioperative period, and long after the surgery. The prevention of surgical site infection during the perioperative period is also important.
We administered immunoglobulin therapy before the operation and after the operation prophylactic intravenous antibiotics for a week. In addition, we performed a left anterior thoracotomy for a left anterior mediastinal tumor instead of a median sternotomy. Mediastinitis is a complication after sternotomy, and postoperative mediastinitis was previously reported in a patient with Good syndrome who underwent thymectomy through a median sternotomy [7]. Therefore, we avoided performing it. Although a thoracoscopic approach is another option, we performed a thoracoscopy-assisted lateral thoracotomy because the tumor diameter was at least 6 cm. It was recently reported that thymectomy alone is appropriate for patients with stage I thymoma [8]. To minimize the risk of postoperative infection, we think thymectomy through a lateral thoracotomy is reasonable for patients with Good syndrome with stage I thymoma.

Conclusion

Management of infections is important for patients with Good syndrome. To minimize the risk of perioperative infection, we should take care while planning the surgical approach and procedure.

Declarations

*Ethics approval and consent to participate*

Written informed consent was obtained from the patient for this case report.

*Consent for publication*

Not applicable

*Availability of data and materials*

Not applicable

*Competing interests*

None of the listed authors has any financial or other interests that could be a conflict.
Funding
Not applicable

Authors' contributions
SI, AS, HO, YA, SK, TMak, TS and AI participated in the surgical procedure. TI, TMae and SM treated infectious diseases. SI and AS wrote the manuscript. AI supervised this research. All authors read and approved the final manuscript.

Acknowledgements
Not applicable

References
1. Jansen A, van Deuren M, Miller J, Litzman J, de Gracia J, Sáenz-Cuesta M, et al. Good Syndrome Study Group. Prognosis of Good syndrome: mortality and morbidity of thymoma associated immunodeficiency in perspective. Clin Immunol 2016;171:12-7.
2. Malphettes M, Gérard L, Galicier L, Boutboul D, Asli B, Szalat R, et al. Good syndrome: an adult-onset immunodeficiency remarkable for its high incidence of invasive infections and autoimmune complications. Clin Infect Dis 2015;61:e13-9.
3. Thongngarm T, Boonyasiri A, Pradubpongsa P, Tesavibul N, Anekpuritanang T, Kreetapirom P, et al. Features and outcomes of immunoglobulin therapy in patients with Good syndrome at Thailand's largest tertiary referral hospital. Asian Pac J Allergy Immunol 2019;37:109-15.
4. Tarr PE, Sneller MC, Mechanic LJ, Economides A, Eger CM, Strober W, et al. Infections in patients with immunodeficiency with thymoma (Good syndrome). Report of 5 cases and review of the literature. Medicine (Baltimore) 2001;80:123-33.
5. Koriyama N, Fukumoto O, Fukudome M, Aso K, Hagiwara T, Arimura K, et al. Successful treatment of Good syndrome with cytomegalovirus duodenoenteritis using
a combination of ganciclovir and immunoglobulin with high anti-cytomegalovirus antibody titer. Am J Med Sci 2004;327:49-54.

6. Park DH, Kim SY, Shin JP. Bilateral cytomegalovirus retinitis with unilateral optic neuritis in Good syndrome. Jpn J Ophthalmol 2010;54:246-8.

7. Kitamura A, Takiguchi Y, Tochigi N, Watanabe S, Sakao S, Kurosu K, et al. Durable hypogammaglobulinemia associated with thymoma (Good syndrome). Intern Med 2009;48:1749-52.

8. Nakagawa K, Yokoi K, Nakajima J, Tanaka F, Maniwa Y, Suzuki M, et al. Is Thymomectomy Alone Appropriate for Stage I (T1N0M0) Thymoma? Results of a Propensity-Score Analysis. Ann Thorac Surg 2016;101:520-6.

Figures
Figure 1

Chest X-ray and Computed tomography on diagnosis. Chest X-ray showing a mediastinal tumor protruding into the left chest cavity (a). Chest computed tomography scan showing a well-defined 61×45-mm tumor (b).
Intraoperative view. The thymoma did not invade surrounding tissues and was easily dissected.
Figure 3

Transitions in serum immunoglobulin G levels. Black circles indicate intravenous immunoglobulin therapy. Black triangle indicates the surgical procedure, and white triangle indicates the onset of cytomegalovirus hepatitis infection. A black square indicates the duration of ganciclovir treatment.

Supplementary Files

This is a list of supplementary files associated with the primary manuscript. Click to download.
CARE-checklist-English-2013.pdf