Cureus
Part of SPRINGER NATURE

Open Access Case Report

Thymoma-Associated Pancytopenia Resolving After Thymectomy: A Case Report and Literature Review

Review began 10/27/2026
Review ended 11/05/2026
Published 11/09/2026

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DOI: 10.7759/cureus.119346

Mouhsin Ibba [1, 2], Hamza Azal [1], Boujemaa Razouq [1], Hicham Fenane [1], Yassine Msougar [1]

1. Thoracic Surgery Department, Mohammed VI University Hospital, Marrakesh, MAR 2. Thoracic Surgery Department, Faculty of Medicine, Cadi Ayyad University, Marrakesh, MAR

Corresponding author: Mouhsin Ibba, m.ibba@uca.ac.ma

Abstract

Thymoma is frequently associated with paraneoplastic syndromes, of which myasthenia gravis is the best known. Hematologic manifestations such as pancytopenia are rare, and published cases suggest that surgery alone is often insufficient, with immunosuppressive therapy frequently required.

We report the case of a 28-year-old woman, deaf-mute since birth, who presented with chronic abdominal pain of 10 months' duration. Investigations showed pancytopenia (normochromic normocytic non-regenerative anemia, neutropenia, and thrombocytopenia) and homogeneous hepatosplenomegaly. The blood smear showed rouleaux formation of the red blood cells and a few activated lymphocytes. The bone marrow aspirate showed a reactive marrow, and the bone marrow biopsy was normal. Serologies for parvovirus B19, hepatitis C virus (HCV), hepatitis B virus (HBV), and HIV were negative. Liver, renal, and hemostasis tests were normal, and the immunologic workup was negative. Plasma protein electrophoresis showed polyclonal hypergammaglobulinemia. The absence of an identified hematologic, infectious, or autoimmune cause led to further imaging. Thoraco-abdomino-pelvic CT revealed a 32 × 27 mm anterior mediastinal mass. Right video-assisted thoracoscopic thymectomy was performed. Histology showed a well-encapsulated type B2 thymoma, Masaoka-Koga stage I. After thymectomy alone, with no immunosuppressive treatment, the cytopenias regressed, the hepatomegaly disappeared, and the splenomegaly decreased.

This case suggests that, in a small, encapsulated thymoma with a non-aplastic marrow, upfront thymectomy with close hematologic monitoring may be a reasonable first step, with immunosuppressive therapy kept for patients whose blood counts do not recover after surgery.

Categories: Radiation Oncology, Pulmonology, Cardiac/Thoracic/Vascular Surgery
Keywords: hypergammaglobulinemia, “pancytopenia”, paraneoplastic syndrome, thymectomy, thymoma

Introduction

Thymomas are tumors of the thymic epithelial cells that develop in the anterior mediastinum. They are notable for their association with a wide range of paraneoplastic syndromes of autoimmune or dysimmune origin, involving the neuromuscular, hematologic, gastrointestinal, cutaneous, renal, and endocrine systems [1]. Myasthenia gravis is the most frequent, but other, less typical manifestations may precede or reveal the tumor.

Hematologic associations described in the literature include pure red cell aplasia, aplastic anemia, autoimmune hemolytic anemia, pernicious anemia, agranulocytosis, pancytopenia, and Good's syndrome (thymoma with hypogammaglobulinemia) [1,2]. The association of thymoma with pancytopenia and polyclonal hypergammaglobulinemia is exceptional. In most reported cases of thymoma-associated pancytopenia, resection alone did not restore the blood counts, and immunosuppressive therapy was needed. Thymic epithelial tumors are thought to disrupt central tolerance: defective negative selection allows mature autoreactive T-cell clones to be exported to the periphery, where they may cause peripheral destruction of blood cells or suppress hematopoietic progenitors [1].

We report a case of thymoma revealed by pancytopenia with hepatosplenomegaly, in which the hematologic abnormalities resolved after thymectomy alone, and we discuss the mechanisms and the particular features of this course in light of the literature.

Case Presentation

A 28-year-old woman, a non-smoker, had been deaf-mute since birth with a history of geophagia in childhood, and consulted the gastroenterology department for chronic abdominal pain with one episode of low-volume rectal bleeding and no fever. Her general condition was preserved.

Abdominal ultrasound showed marked homogeneous splenomegaly and hepatomegaly without signs of portal hypertension. Proctologic examination was unremarkable. Laboratory tests revealed pancytopenia with normochromic normocytic anemia (hemoglobin 9.3 g/dL), neutropenia (neutrophils 241/mm³), and thrombocytopenia (platelet count 106,000/mm³). The reticulocyte count was 118,000/mm³, confirming a non-regenerative anemia.

The bone marrow aspirate showed a reactive marrow, and the bone marrow biopsy was normal. Serologies for parvovirus B19, hepatitis C virus (HCV), hepatitis B virus (HBV), and HIV were negative. Liver, renal, and hemostasis tests were normal, and the immunologic workup was negative. Plasma protein electrophoresis showed polyclonal hypergammaglobulinemia.

The absence of an identified hematologic, infectious, or autoimmune cause led to further imaging.

Thoraco-abdomino-pelvic CT showed a tissue-density mass of the anterior mediastinum measuring 32 × 27 mm (Figure *1A*) and a homogeneous hepatomegaly and splenomegaly (Figure *1B*).

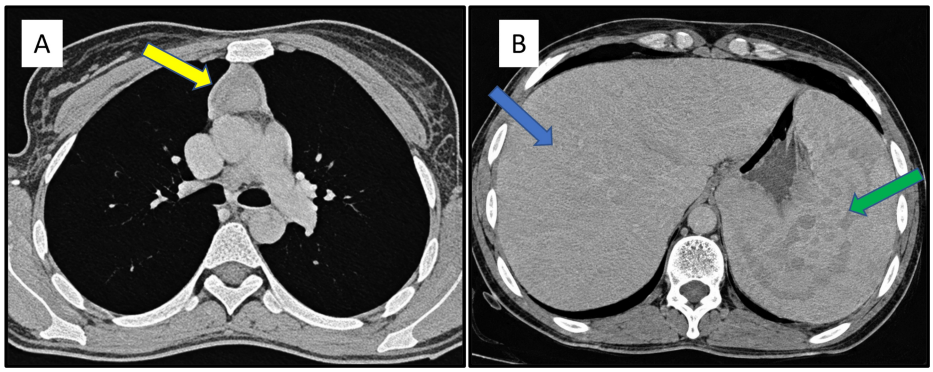


FIGURE 1: Thoraco-abdomino-pelvic CT scan. (A) Thoracic CT showing a tissue-density mass of the anterior mediastinum measuring 32 × 27 mm. (B) Abdomino-pelvic CT showing hepatosplenomegaly.

Yellow arrow: thymoma; blue arrow: liver; green arrow: spleen.

Tumor markers (alpha-fetoprotein, lactate dehydrogenase (LDH), and plasma beta-human chorionic gonadotropin (β-hCG)) and anti-acetylcholine receptor antibodies were negative.

Right video-assisted thoracoscopic thymectomy was decided (Figure *2*). The preoperative workup (pulmonary function tests and echocardiography) was normal. The postoperative course was uneventful. No immunosuppressive treatment was given.

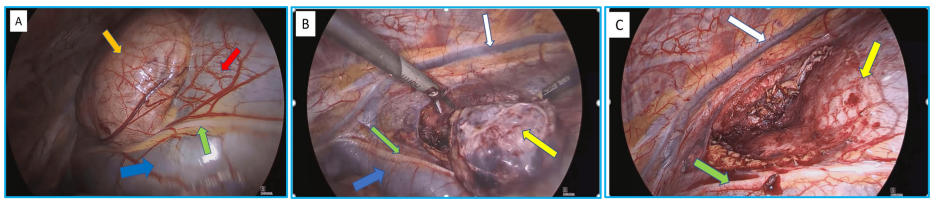


FIGURE 2: Intraoperative view of the thymoma during thymectomy.

(A) The thymoma in place, well encapsulated. (B) After complete resection of the tumor. (C) Empty thymic bed after extraction of the specimen. Yellow arrow: thymoma; red arrow: pericardium; blue arrow: superior vena cava; green arrow: phrenic nerve; white arrow: internal mammary pedicle.

Histologic examination concluded to a type B2 thymoma, well encapsulated, without capsular invasion, corresponding to Masaoka-Koga stage I. Immunohistochemistry showed moderate, diffuse nuclear expression of terminal deoxynucleotidyl transferase (TdT) and membranous expression of CD5 in the lymphoid cells, consistent with an abundant population of immature T lymphocytes, as expected in a type B2 thymoma.

The case was discussed at a multidisciplinary team meeting after thymectomy, and there was no indication

for adjuvant radiotherapy.

After thymectomy alone, the symptoms and the pancytopenia regressed, the hepatomegaly disappeared, and the splenomegaly regressed. Because the patient lives in a remote rural area with limited access to health facilities, the planned one-month follow-up visit could not be carried out, and the first postoperative blood count was obtained at three months. At that time, hemoglobin was 11.6 g/dL, neutrophils 1,279/mm³, and platelets 146,000/mm³; at two years of follow-up, the complete blood count was within the reference ranges (Table *1*). Chest CT scans performed three months, one year, and two years after surgery showed no signs of recurrence (Figure *3*).

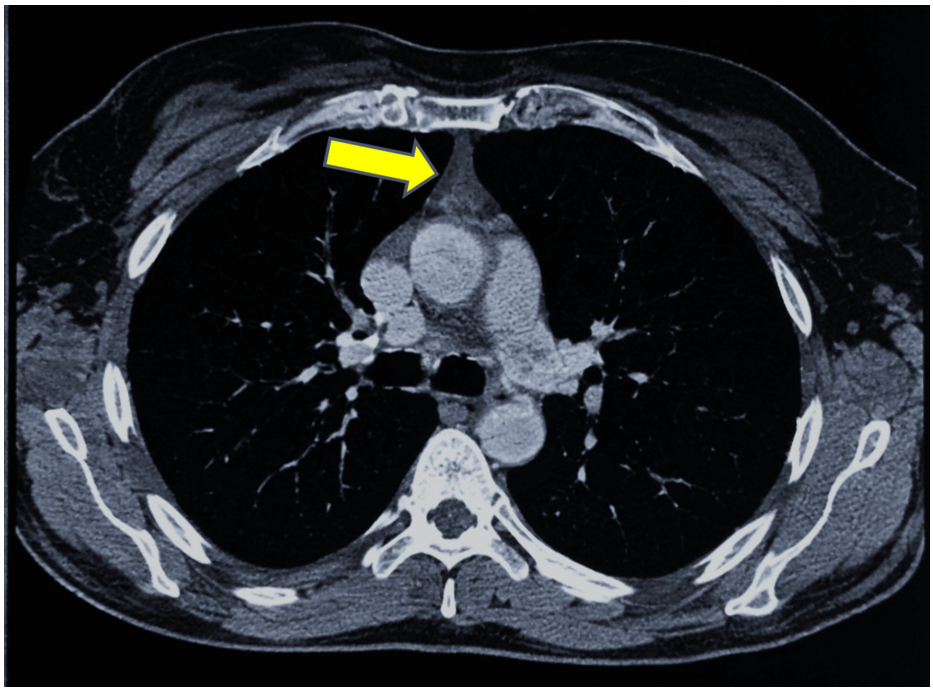


FIGURE 3: Chest CT scan performed two years after thymectomy, showing no sign of recurrence.

Yellow arrow: thymic bed with only postoperative fibrosis.

Parameter	Preoperative	Three months postoperative	Two years postoperative	Reference range
Hemoglobin (g/dL)	9.3	11.6	13.2	12-16
Neutrophils (/mm³)	241	1,279	3,840	2,000-7,500
Platelets (/mm³)	106,000	146,000	157,000	150,000-400,000

TABLE 1: Complete blood count before thymectomy and at three months and two years of follow-up

Discussion

Thymomas are distinguished by the diversity of their paraneoplastic manifestations. These manifestations can be classified by system [1]: neuromuscular (myasthenia gravis, Lambert-Eaton syndrome, myositis, neuromyotonia, limbic encephalitis, Morvan's syndrome, autonomic neuropathy, cerebellar degeneration, stiff-person syndrome), gastrointestinal, renal, cutaneous (pemphigus, lichen planus, vitiligo, alopecia), cardiovascular, respiratory, and hematologic. In our patient, there were no neuromuscular signs, and anti-AChR antibodies were negative: pancytopenia associated with hepatosplenomegaly was the only identified paraneoplastic manifestation.

The association of thymoma and pancytopenia has long been described as isolated case reports, since the

1960s [2], with pictures of marrow aplasia and splenomegaly [3], pancytopenia with hypogammaglobulinemia [4], or Good's syndrome complicated by severe pancytopenia [5]. The age and scattering of these publications reflect the rarity of the association.

The proposed mechanism is a thymoma-induced immune dysregulation, producing autoreactive or abnormal T lymphocytes that may target hematopoietic progenitors or cause peripheral destruction of blood cells. In our case, the marrow was reactive and the bone marrow biopsy was normal, which point more toward a peripheral or non-aplastic central mechanism than true marrow aplasia.

The immunologic situation of our patient contrasts with that of Good's syndrome, in which hypogammaglobulinemia is the rule. Cases of thymoma associated with hypergammaglobulinemia have nevertheless been reported [6,7], sometimes in an autoimmune context (systemic lupus erythematosus, chronic mucocutaneous candidiasis). The polyclonal hypergammaglobulinemia observed in our patient, together with rouleaux formation on the smear, reflects polyclonal immune activation, and its reversibility after tumor resection supports a link with the thymoma.

Reports of thymoma associated with pancytopenia or marrow aplasia most often describe an insufficient response to resection alone. Chintakuntlawar et al. describe a 68-year-old woman resistant to high-dose corticosteroids who responded to cyclosporine before undergoing thymectomy. Their review concludes that resection alone is generally ineffective and that cyclosporine-based regimens are most often associated with resolution (response rate 66.6%) [8].

De Giacomo et al. report a 43-year-old woman in whom pancytopenia persisted after thymectomy (weekly transfusion dependence, failure of prednisone 50 mg/day) and corrected after addition of cyclosporine; she was stable at 30 months [9].

Ghazizadeh et al. report a 34-year-old man with severe aplastic anemia and a type B2 thymoma, Masaoka-Koga stage III, whose blood counts did not improve after thymectomy. They normalized about six months after the start of cyclosporine, tapering prednisone, and one course of intravenous immunoglobulin, with no recurrence over 42 months. Their review of 19 published cases concluded that thymectomy alone was rarely sufficient for hematologic remission [10].

Koizumi et al. describe a 72-year-old woman with a well-differentiated squamous cell thymic carcinoma and severe aplastic anemia detected simultaneously. Hematopoiesis partially recovered after resection of the tumor, and the addition of cyclosporine, prednisolone, and methenolone improved the blood counts further, with a stable partial remission maintained for 22 months. Her preoperative serum suppressed the formation of erythroid and non-erythroid colonies from her own bone marrow cells, unlike her postoperative serum [11].

In contrast to these reports, our patient recovered with thymectomy alone, without any immunosuppressive therapy. To our knowledge, based on the cases we reviewed, such a course is less often described.

Several factors could explain why thymectomy alone was enough in our patient, although these remain hypotheses. The tumor was small (32 × 27 mm), well encapsulated, and stage I. The marrow was reactive and the biopsy normal, so the cytopenias may have resulted from peripheral immune activation, which may reverse more readily once the antigenic source is removed than a true marrow aplasia, which tends to behave as an established autoimmune disease. The patient was also operated on while still in good general condition, and cases in which surgery alone is enough may be less often published than those requiring immunosuppression.

If confirmed in other patients, this would suggest that for a small resectable thymoma with a non-aplastic marrow, upfront thymectomy with close hematologic monitoring is a reasonable first step, with immunosuppression kept in reserve if counts do not recover.

Conclusions

A thymoma should be considered in any unexplained pancytopenia, especially with hypergammaglobulinemia and hepatosplenomegaly, and chest imaging is an essential step in the workup. In our patient, thymectomy alone led to regression of the pancytopenia and hepatosplenomegaly. This case suggests that in a small, encapsulated thymoma with a non-aplastic marrow, upfront thymectomy with close hematologic monitoring may be a reasonable first step, with immunosuppressive therapy reserved for patients whose blood counts do not recover after surgery.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Mouhsin Ibba, Boujemaa Razouq, Hamza Azal, Hicham Fenane, Yassine Msougar

Acquisition, analysis, or interpretation of data: Mouhsin Ibba, Hicham Fenane, Yassine Msougar

Drafting of the manuscript: Mouhsin Ibba, Hamza Azal, Yassine Msougar

Critical review of the manuscript for important intellectual content: Mouhsin Ibba, Boujemaa Razouq, Hamza Azal, Hicham Fenane

Supervision: Hicham Fenane, Yassine Msougar

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

During the preparation of this manuscript, the authors used Claude (Anthropic, San Francisco, CA, USA), for drafting assistance and formatting following the journal template. The authors reviewed and edited all content, and take full responsibility for the content of the published article.

References

1. Blum TG, Misch D, Kollmeier J, Thiel S, Bauer TT: Autoimmune disorders and paraneoplastic syndromes in thymoma. J Thorac Dis. 2020, 12:7571-90. 10.21037/jtd-2019-thym-10
2. Barnes RDS, O'Gorman P: Two cases of aplastic anaemia associated with tumours of the thymus . J Clin Pathol. 1962, 15:264-8. 10.1136/jcp.15.3.264
3. de Castro MA, de Castro MA, Arantes Ade M, Roberti Mdo R: Thymoma followed by aplastic anemia - Two different responses to immunosuppressive therapy. Rev Bras Hematol Hemoter. 2011, 33:476-7. 10.5581/1516-8484.20110125
4. Rogers BH, Manligod JR, Blazek WV: Thymoma associated with pancytopenia and hypogammaglobulinemia: Report of a case and review of the literature. Am J Med. 1968, 44:154-64. 10.1016/0002-9343(68)90248-9
5. Hsu DS, Wilde SA, Velotta JB: Thymoma associated with severe pancytopenia and Good's syndrome: Case report. AME Case Rep. 2021, 5:22. 10.21037/acr-21-4
6. Taheri D, Suzangar HR, Sherkat R, Biria S, Tabatabai A, Fesharakizadeh M: Thymoma associated with hypergammaglobulinemia: A case report. Iran J Pathol. 2009, 4:44-7.
7. San Filippo J: Chronic mucocutaneous candidiasis associated with malignant thymoma and systemic lupus erythematosus with hypergammaglobulinemia: A case report and literature review. Cutis. 2006, 78:57-60.
8. Chintakuntlawar AV, Rizvi SA, Cassivi SD, Pardanani A: Thymoma-associated pancytopenia: Immunosuppressive therapy is the cornerstone for durable hematological remission. Ann Hematol. 2015, 94:453-8. 10.1007/s00277-014-2230-x
9. De Giacomo T, Rendina EA, Venuta F, Flaishman I, Ricci C: Pancytopenia associated with thymoma resolving after thymectomy and immunosuppressive therapy. Case report. Scand J Thorac Cardiovasc Surg. 1995, 29:149-51. 10.3109/14017439509107222
10. Ghazizadeh M, Ghazizadeh M, Moini M: Aplastic anemia proceeding to thymoma: A rare co-occurrence-A case report and review article. Case Rep Hematol. 2026, 2026:6971236. 10.1155/crh/6971236
11. Koizumi K, Nakao S, Haseyama Y, et al.: Severe aplastic anemia associated with thymic carcinoma and partial recovery of hematopoiesis after thymectomy. Ann Hematol. 2003, 82:367-70. 10.1007/s00277-003-0640-2