ml of normal saline solution using a No. 42 De Vilbiss nebulizer attached to a Pulmo-Aide air compressor. This resulted in an increased granulocyte count, a 27 percent drop in FEV, and fever (Fig 1). Initial results of spirometric testing were near normal with FVC of 3.02 L (82 percent predicted), FEV, of 2.17 L (83 percent predicted) and FEV/FVC of 71 percent. Four hours after the challenge, FVC fell to 2.69 L. FEV, fell to 1.59 L, and FEV/FVC was at its nadir (57 percent) 21 hours after the challenge. At this time, results of diffusion studies were normal.

Percent eosinophils, urinalysis, SMA-12, C3 and C4 were unaltered and within normal limits; the sedimentation rate rose from 28 to 35 mm/hr. Ouchterlony gel diffusion of serum to 1:1, 1:2, 1:4, 1:8, and 1:16 dilutions of 20 percent Mucomyst was negative.

**DISCUSSION**

Despite extensive use for over 20 years, few major adverse effects have been reported to inhaled NAC. Taylor and Fischbein reported a febrile reaction to intravenous NAC in a 9-year-old man with rheumatoid arthritis and aplastic anemia. The fever occurred on the tenth infusion of NAC and was accompanied by rash, nausea, and vomiting. The fever was not reproduced a second time, although she received acetaminophen before the 11th infusion. Only ten instances of fever, and one of fever and chills, none from aerosol, are on file with the manufacturers. In our patient, the fever was reproduced on three consecutive occasions. There was associated leukocytosis, myalgia, arthralgia, and obstructive lung function. The fever peaked 11 hours after the challenge and all signs and symptoms resolved by 48 hours. According to our literature search, this is the first report of a febrile reaction to inhaled acetylcysteine.

The febrile episodes have the kinetics and symptom complex of a type 3 Arthus reaction; an IgE-mediated reaction was unlikely in view of negative skin tests and presence of fever. A cytotoxic effect on the ciliated cells permitting bacterial or inflammatory cell products to enter the systemic circulation cannot be ruled out, but the latent period of eight days is against this, as is the prompt reaction following challenge five months later.

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**Recurrence of Thymic Hyperplasia after Trans-sternal Thymectomy in Myasthenia Gravis**


A 23-year-old woman with myasthenia gravis underwent thymectomy in September, 1975 by a trans-sternal approach for the removal of an hyperplastic gland. Surgical intervention was followed by marked improvement of her symptoms. Five years later, symptoms recurred. In March, 1982 diagnostic pneumomediastinum disclosed an anterosuperior mediastinal mass which, on excision, proved to be an hyperplastic thymus. This report confirms previous findings of thymus regrowth after surgery. It also demonstrates that surgical techniques using the trans-sternal approach do not guarantee complete removal of the thymus.

Thymectomy is a therapeutic measure that is considered useful in the treatment of myasthenia gravis, even though the effectiveness in producing remission and the preferred surgical approach are subject to discussion. Some surgeons prefer a trans-sternal approach to excise the gland and/or mediastinal fat that may lodge ectopic thymic tissue. Others favor the transcervical approach, which is less traumatic and has lower morbidity and mortality rates. The proportion of remissions reported following transcervical thymectomy is similar to that following trans-sternal thymectomy, even after stratification for severity of disease.

Postoperative recurrence of thymoma is not infrequent and may be explained by the neoplastic nature of the process. We have recently published a series of patients with myasthenia gravis (MG) and thymic hyperplasia, operated on by a transcervical approach and in whom thymus tissue was found some time after surgery. Many of them were reoperated and new hyperplastic thymus was found. The patient described here is the first reported case, to our knowledge, in which hyperplastic thymic tissue was found at reoperation when the original surgery was carried out through a trans-sternal approach.

**CASE REPORT**

A 23-year-old woman had nasal speech patterns since the age of 12, but myasthenia gravis was not diagnosed until she developed ptosis two years later. An initial repetitive stimulation test and several endrophonium tests confirmed the diagnosis. She was treated with anticholinesterase drugs and corticosteroids. In September, 1975 she underwent thymectomy by a trans-sternal incision and the hyperplastic thymus was removed. Her post-operative course was unremarkable: her symptoms improved and therapy with a lower dose of medication were required. For intervals, remission was complete. In 1980, muscle weakness reappeared to the point of occasionally requiring mechanical ventilatory support.

In March, 1982 she was admitted to our hospital. Pneumomediastinographic examination was performed, and a shadow with clear outlines was observed in the anterosuperior mediastinum (Fig 1).
1. She was reoperated on March 25, 1982 through a sternotomy; thymic tissue was found under the innominate vein and also at a sub-thyroid cervical level; 22 g of tissue were removed. Microscopic examination showed it to be hyperplastic thymus (Fig 2).

Postoperatively, she required mechanical ventilatory support for five days. She then improved and was dismissed on the 12th postoperative day. She became pregnant one year later. Pregnancy was normal and she delivered a full term, normal baby. Presently, 36 months after the second operation, she is clinically improved but requires therapy with anticholinesterase drugs.

DISCUSSION

The unpredictable course of a patient with myasthenia gravis makes it mandatory to look for the cause of exacerbation in a post-thymectomy patient who had been well-controlled. At present, it is agreed that patients with MG and thymic hyperplasia improve if the gland is removed. Percentages vary according to published series.19

Thomoway's findings of circulating thymic hormone after a supposedly total thymectomy, and our findings in which recurrence of hyperplastic thymus was proved, leads us to think that one must bear in mind that a re-growth of thymic tissue is produced in patients with or without transitory improvement. This may be due to remnants, left by incomplete surgery or secondary to ectopic thymic tissue. It is in this sense that there may be grounds for discussion between groups who advocate extensive surgical techniques and those who are in favor of less traumatic approaches such as a cervicotomy. Nevertheless, it seems that a thorough approach is not sufficient to exclude the possibility of thymic recurrence, as shown by the reported case. This is the reason why we insist on the need to re-study those patients whose post-thymectomy evolution is not satisfactory. We must point out that, according to our criteria, the employment of the pneumomediastinum as a contrast, whether for computerized tomography or for a profile linear tomography, is of great importance to visualize small masses in the anterior and superior mediastinum.

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Primary Pulmonary Amyloidosis*
An Unusual Case with 14 Years' Survival

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Figure 1. Pneumomediastinography before reoperation.

Figure 2. Area of an hyperplastic thymus with Hassall corpuscles (HE, original magnification × 40)