

Phenotype-Preserving MGFA Better Stratifies Myasthenia Gravis Hard Relapse After Thymoma Resection



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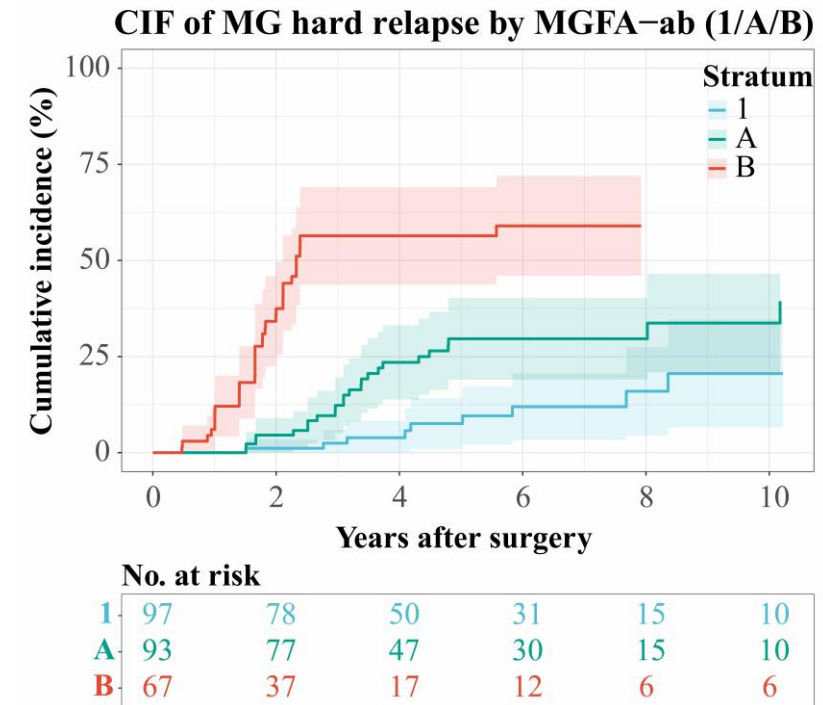
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Introduction

Neurologic outcomes after thymoma resection in thymoma-associated myasthenia gravis (TAMG) are heterogeneous, and postoperative hard relapse has rarely been quantified under competing risks. We evaluated relapse kinetics, independent predictors, and the comparative utility of clinical classification systems.

Methods

This multicenter retrospective study included 257 patients with TAMG who underwent thymoma resection at three centers in southern China between January 1, 2009, and November 30, 2025. MG hard relapse was defined as Myasthenia Gravis Foundation of America postintervention status exacerbation plus treatment escalation or rescue therapy. Death without relapse was treated as a competing event. Cumulative incidence functions were estimated with the Aalen-Johansen method and compared with Gray tests. Fine-Gray models assessed independent predictors.



69

Observed MG hard
relapses

29.0%

Five-year cumulative
incidence

10.63

Group B vs group 1:
adjusted sHR



Primary Findings

With a median follow-up of 41.6 months, 69 MG hard relapses and 21 deaths without relapse occurred. The cumulative incidence of relapse was 20.4% at 3 years and 29.0% at 5 years; 68% of relapses occurred within 3 years and 90% within 5 years. MGFA-ab showed the strongest separation, with 3-year cumulative incidences of 2.5%, 12.3%, and 56.4% and 5-year cumulative incidences of 7.6%, 29.6%, and 56.4% for groups 1, A, and B, respectively.

Additional Findings

- Versus group 1, adjusted sHR was 2.57 (95% CI, 1.15-5.73) for group A and 10.63 (95% CI, 4.60-24.58) for group B.
- MGFA-ab discrimination at 3 and 5 years: AUC 0.816 and 0.721.
- Corresponding AUCs were 0.711 and 0.681 for MGFA-num and 0.761 and 0.647 for Osserman.

Table 1. Predictive performance of competing models

Model	3-year AUC	5-year AUC	3-year Brier	5-year Brier
Base model	0.598	0.572	0.168	0.218
Base + MGFA-ab	0.816	0.721	0.127	0.194
Base + MGFA-num	0.711	0.681	0.155	0.202
Base + Osserman	0.761	0.647	0.139	0.210

Note: Higher AUC and lower Brier score indicate better performance. The base model included age, sex, Masaoka stage, WHO histology, resection status, and postoperative adjuvant therapy.



Conclusion

**MG hard relapse after thymoma resection clusters in the early postoperative years.
A phenotype-preserving MGFA classification provides the most informative
postoperative relapse stratification and may support risk-adapted follow-up.**

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Ethics

Institutional review boards of the participating centers (April 16, 2025; No. 2025KY123); informed consent was waived.

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