

## MYASTHENIA GRAVIS AND THYMECTOMY: A 10-YEAR STUDY IN SHIRAZ

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### ABSTRACT

A retrospective comparative study was performed on 54 patients treated medically or surgically (thymectomy) for myasthenia gravis (MG) from 1979-1989 in three Shiraz University Hospitals. Each surgical patient was compared with a medical patient on the basis of age, sex, severity and duration of disease. Complete remission was noted in 3 out of 27 thymectomized patients but in none of the medically treated patients. Improvements occurred in 15 of 27 surgical patients and 4 out of 27 medically treated patients during 4 years of follow-up. Patients undergoing thymectomy had a significantly better chance of long survival. Three patients in the medically treated group had died because of myasthenia gravis as compared to 1 in the surgically treated group. Concerning survival in relation to sex, duration of symptoms and age, there was no significant difference between the two groups. Until more effective treatment becomes available for myasthenia gravis, thymectomy deserves consideration for all patients with chronic symptoms.

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### INTRODUCTION

Thymectomy is increasingly important in managing patients with myasthenia gravis. The risks of thymectomy are now small, provided the operation is undertaken in a center with good intensive care facilities and in a unit experienced in the operation.<sup>9</sup>

The incidence of remission increases with the number of years after thymectomy.<sup>4</sup> Complete remission or substantial improvement may be expected in 80% of patients without a thymic tumor, though it may take three to five years before the benefits of surgery are apparent.<sup>8</sup> With the exception of those with purely ocular forms of the disease, most patients with myasthenia should be offered thymectomy as a therapeutic alternative.

Thymectomy is occasionally advocated for patients with disabling ocular myasthenia.<sup>5</sup> The earlier the operation is undertaken in the course of the disease, the better the results.<sup>8</sup>

### PATIENTS AND METHODS

Fifty-four patients treated at the three hospitals of Shiraz University from 1979-1989 for myasthenia gravis were studied. Four years of complete follow-up data was available on 53 of the patients. Of 54 patients, 27 were treated surgically. All thymectomies were carried out by median sternotomy. Patients less than 17 years of age at the onset of disease were excluded from the study. Each patient was classified into one of the five following categories depending on the status at presentation: 1) remission, 2) improved, 3) unchanged, 4) worse and 5) dead. Remission occurred when the patient required no medication and had no symptoms of myasthenia gravis except in rare instances when a mild inconstant deficit was present.

The patient was considered improved if less medication was required than on the previous clinical evaluation and if the handicap from the disease had decreased. If the changes were minimal or equivocal,

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the status was considered unchanged. Death was designated as related to myasthenia gravis if it occurred after progressive weakness and respiratory failure in the absence of other significant diseases.

### RESULTS

The surgically treated group were 8 males and 19 females. The medically treated control group were 6 males and 21 females. The mean age at onset of myasthenia gravis was 24.7 years for surgically treated patients and 24.2 for the medically treated patients. Table I shows the age/sex distribution of the two groups.

Thirteen patients in each group had moderate to severe symptoms of myasthenia gravis. Only 3 patients had ocular symptoms alone, which in itself is not an indication for surgery. Table II shows the distribution of physical signs at initial presentation.

Complete remission was noted in 3 thymectomized patients (2 patients in IIA and one in IIB) and in none of those treated medically. A further 15 patients improved after operation as compared to 4 of the medically treated group. The condition of 3 surgical and 12 medical patients remained static, while three surgical and 6 medical patients deteriorated. One of 3 deaths in the surgical group and 3 of 4 deaths in the medical group were attributed to myasthenia gravis (one medical patient was lost to follow-up). Table III shows that thymectomized patients have a significantly better chance of remission and improvement and, ultimately, more chance of surviving. The mean duration of disease before death in medical patients was 6 years as compared to 10 years for the surgically treated patients.

In surgically treated patients the outcome was

Table I. Age distribution by decades and sex of 54 patients with myasthenia gravis.

| Age(year) | Surgically treated (27) |   | Medically treated (27) |    |
|-----------|-------------------------|---|------------------------|----|
|           | M                       | F | M                      | F  |
| 17-20     | 1                       | 6 | -                      | 2  |
| 21-30     | -                       | 3 | 2                      | 7  |
| 31-40     | 4                       | 4 | 1                      | 2  |
| 41-50     | 3                       | 6 | 3                      | 10 |

independent of age at onset, and the overall survival was higher in this group regardless of age ( $P=0.02$ ). Nevertheless, the duration of symptoms has an influence on long-term survival.

Improved results are achieved with early operation. There was no significant difference in survival between the two sexes. However, the survival experience of females was significantly better in the thymectomy group than the medically treated group ( $P=0.011$ ).

Table IV shows the histological features of 27 excised specimens. Patients with thymic hyperplasia had longer survival rates compared to other groups.

### DISCUSSION

The relationship between the thymus and myasthenia gravis was suggested by Weigert in 1901.<sup>16</sup> Between 1939 and 1944, Blalock published results of thymectomies in the treatment of myasthenia gravis.<sup>3</sup> It

Table II. Clinical findings in the two groups at initial presentation based on Osserman's clinical manifestation scale.

| Physical signs  | No. of surgical patients | No. of medical patients |
|---|--------------------------|-------------------------|
| I. Ocular myasthenia  | -                        | 3                       |
| IIA. Mild generalized disease in addition to ocular and bulbar involvement  | 6                        | 4                       |
| IIB. Moderate generalized disease involving ocular, bulbar and limb muscles | 8                        | 10                      |
| III. Acute fulminating disease requiring early respiratory support          | 9                        | 10                      |
| IV. Chronic severe weakness of long duration                                | 4                        | -                       |

**Table III. Comparison of clinical outcome between the two groups.**

| Status             | Surgically treated | Medically treated |
|--------------------|--------------------|-------------------|
| Complete remission | 3                  | —                 |
| Improved           | 15                 | 4                 |
| Unchanged          | 3                  | 12                |
| Worse              | 3                  | 6                 |
| Death              |                    |                   |
| Myasthenia gravis  | 1                  | 3                 |
| Other causes       | 2                  | 1                 |
| Lost to follow-up  | —                  | 1                 |

**Table IV. Histopathological findings in 27 surgically treated patients**

| Pathologic findings    | Male | Female |
|------------------------|------|--------|
| Thymoma                |      |        |
| Benign                 | 1    | 2      |
| Malignant              | —    | 1      |
| Follicular hyperplasia | 6    | 15     |
| Normal thymus          | 1    | 1      |

was on the basis of Blalock's experience that thymectomy was gradually favored, particularly after the recognition of the immunological nature of myasthenia gravis by Simpson.<sup>15</sup>

Surgical interest has been maintained, and reports of large groups of surgical patients have been compared to patients treated medically with the general conclusion that thymectomy had the most to offer for the young female patient with myasthenia gravis of short duration.<sup>6,10,13,14,16</sup>

Alpert and associates found that delayed remission after thymectomy was related to the presence of thymic hyperplasia.<sup>1</sup> Fujii and associates found that patients who were either under 40 years of age, females, or without thymoma had good clinical results after thymectomy alone.<sup>7</sup>

Beghi et al. found that the only variables correlated to the chance of complete remission were younger age at onset of MG, lower severity of symptoms at onset and nadir, and shorter disease duration at diagnosis. They also reported that the presence of thymoma did not significantly influence the outcome of the disease.<sup>2</sup> In our study the longer survival of patients with thymic hyperplasia was statistically significant.

In the past thymectomy was accepted for treating young females with myasthenia of short duration.<sup>13</sup> Our observations suggest that patients treated surgically, regardless of sex and age, have a significantly better

survival rate than patients treated medically. Improved management of respiratory complications in patients with myasthenia gravis has resulted in significant improvement of postoperative morbidity and mortality.

At present, neurologists with interest and expertise in MG use a variety of therapeutic strategies. Most neurologists advocate thymectomy for selected patients with generalized myasthenia without thymoma. Nevertheless, with few exceptions, thymectomy is recommended for virtually all patients with thymoma.<sup>5</sup>

It seems likely that future discoveries will validate the medical management of myasthenia gravis, but for the present, the beneficial role of thymectomy for these patients has been clearly demonstrated.

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