Assessment of the Value of Thymic Scan in Myasthenia Gravis

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Summary. Fifty-three patients were investigated by $^{75}$Se methionine scan in order to evaluate the role of the thymus gland in myasthenia gravis. The thymus of 28 of the above patients was examined histologically. Five out of six thymomas were detected with this technique and eight out of twelve hyperplasias were revealed. The above data suggests that $^{75}$Se methionine scan is a useful, innocuous tool for diagnosing neoplasms and abnormal germinal centers in thymus glands.

Key words: Thymic scan – Thymus hyperplasia – Thymoma – Myasthenia gravis.


Castleman [4] ascertained that 82% of patients with myasthenia gravis had alterations of the thymus, of which the most frequently found was hyperplasia of the germinal centers (70% of cases). This is due to proliferation of B lymphocytes [1]. A lymphoepithelial thymoma found in 10—12% of cases is usually well encapsulated and rarely infiltrates the surrounding tissues.

Scanning techniques have been used in recent years [26, 27] to evaluate the relationship between abnormal thymus and myasthenia gravis.

Evidence that demonstrates the link between pathology of the thymus gland and myasthenia gravis has been furnished by the therapeutic results following

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early thymectomy [3, 10, 13, 17, 20, 23, 24]. The appropriateness of thymectomy for patients without evidence of thymoma has been questioned by McQuillen and Leone [11] but its benefit in the active stage of the disease has been reviewed by Simpson [25]. In order to evaluate patients for thymectomy beyond strict clinical criteria, it is necessary to use a number of diagnostic techniques to document thymus pathology, keeping in mind that it is not infrequent to find an ectopic thymus [19]. Among the diagnostic methods more widely used are the various roentgenographic procedures to explore the mediastinum for evidence of a mass: routine chest radiography, mediastinal tomography and, more recently, computed tomography [8].

The use of thymus scan has been advocated for detecting thymomas, but not for thymic hyperplasia [7, 12, 27] as the most reliable and safe method since it is both easy to use and is innocuous.

In the past 10 years, we have been able to perform thymic scans on most of the myasthenic patients admitted to our clinic, so it seemed worth reporting our experience about the value and limits of this technique.

**Patient Data and Methods**

Since 1968, 53 patients with myasthenia gravis were admitted to our department and have undergone thymic scan. We compared the results obtained by scanning with conventional radiography of the mediastinal space. Each study was evaluated independently by two radiologists who evaluated either the scan or the X-ray tomography, and their opinion was compared with the findings at operation. There was good correlation and agreement between different observers on scan interpretation. Dubious scans were repeated. In order to analyze the diagnostic value of this method, the following parameters were considered for each patient in the group with abnormal scan: age of onset, muscle groups involved, treatment performed before and after the scan (Table 1). Finally, the pathological examination of the thymus gland was evaluated in patients who had surgical thymectomy or autopsy, to assess the value and limits of this method.

**Thymus Scan.** Patients were given an intravenous injection of 2.5—3.5 µCi/kg of body weight of seleniomethionine $^{75}$Se and scanning was performed at intervals of 3, 6, 24 and 48 h with a Magnascanner 5001 on which we could obtain black and white and serial color images. The mediastinum was focalized with a high energy collimator at 12.5 cm focus. Two patients were subjected to scintigraphic control with gallioctate $^{67}$Ga according to the technique of Swick et al. [26] and in these patients the scan was also carried out after intravenous subministration of bleomycin labeled with cobalt $^{57}$Co [15]. Scanning was performed in these patients 24 and 48 h following the introduction of the tracer.

As a control group, we scanned 18 patients with carcinoma of the pancreas free from mediastinal lesions and in whom seleniomethionine $^{75}$Se had been introduced for scintigraphy of the pancreas.

**Results**

The thymus scan was interpreted as abnormal in 23 patients (43%, Table 1), since it showed either localized or diffuse uptake of the tracer by the gland. This took place especially in the late phase clearly distinct from the uptake of the blood pool (Figs. 1 and 2). Three patients of this group were subsequently exposed to a course of radiotherapy (3000 rads) and the thymus scintigraphy became negative thereafter.