elongation, carotid body tumour, adenopathies, peritonsillar abscess, branchial cleft cyst, and cystic hygroma.[1,2] Echo Doppler and especially CT-angiography or MRI-angiography of SAT and CW are necessary to determine the diagnosis, but today's gold standard for assessing anatomical details and choosing the optimal treatment is arteriography of SAT and CW.[1–3] Treatment indications depend on the aneurysm's clinical manifestations, size, location, and aetiology, as well as the patient's surgical risk.[1–3,5,6] The aim of treatment is to prevent severe neurological complications and associated secondary mortality.[1,2,5] Extracranial carotid artery aneurysms show a mortality rate of 71% due to thrombosis, embolism, or rupture. In patients undergoing surgical or endoluminal repair, this rate decreases to 30%.[1–4] Today's treatment alternatives are surgical procedures involving aneurysm exclusion and arterial suture, or bypass graft (prosthetic or autologous). Techniques are associated with neurological morbidity (peripheral and central) ranging between 6% and 20%, depending on the series, and a mortality rate of about 2%.[1–5] Another alternative is endoluminal treatment with aneurysm embolisation and placement of endoprosthesis; this is useful when the aneurysms are surgically inaccessible, as in our case, or in patients with a high surgical risk. This last alternative is on the rise, but no randomised studies that analyse long-term results are available at present.[1–3] To conclude, we highlight that while this entity is infrequent, it should be considered among the possible causes of TIA or stroke.[1]

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Myasthenia gravis in association with extrathymic neoplasia☆

Miastenia gravis y asociación con neoplasias extratímicas

Dear Editor:

Myasthenia gravis (MG) is considered a paraneoplastic phenomenon and it is associated with thymoma in 15% of all thymoma patients. However, its association with other extrathymic malignancies remains a matter of debate that has not been completely investigated.[1,2]

In an MG prevalence study carried out in our setting,[3] we found that 3 out of 29 patients (10%) had presented extrathymic malignancies previous to or at the time of diagnosis with MG. These 3 cases were a man with history of non-Hodgkin lymphoma, a man diagnosed with gastric adenocarcinoma when admitted due to MG symptom onset, and a woman with history of breast cancer.

The aim of our study is to review and discuss the association of MG with other extrathymic malignancies and present 3 new cases evaluated in our hospital.

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Case 1. Male patient 62 years of age who had presented generalised adenopathy 15 years previously. Imaging tests showed bilateral axillary adenopathies, retroperitoneal adenopathies, and adenopathies on the right paratracheal lymph nodes. Results from the anatomical pathology study of adenopathies and of the spine were compatible with follicular mixed small-cleaved and large-cell lymphoma. Since the patient was clinically and radiologically stable, no treatment had been started at that date. Regarding neurological follow-up, the patient presented fluctuating diplopia in the past year that responded well to treatment with pyridostigmine (240 mg/day). A few months later, the patient's condition worsened and he presented total ptosis and difficulty chewing. Doctors then started treatment with low doses of prednisone (10 mg/day), with good tolerability and efficacy. Diagnosis of MG was based on the electrophysiological study, which revealed a pathological decrement of more than 10% to low-frequency repetitive facial nerve stimulation. No presence of thymoma has been confirmed by any of the imaging tests requested during follow-up. Although no antibodies were detected initially, subsequent measurement of anti-AChR antibodies showed high levels in blood, with a titre of 3.98 nmol/L (normal level < 0.20 nmol/L).

Case 2. A 72-year-old man was admitted to the emergency department due to progressive loss of limb and neck strength with no bulbar or ocular symptoms. He did not present wasting syndrome or pain. Treatment with IV immunoglobulins and pyridostigmine was started and

the patient regained walking ability. Results for anti-AChR antibodies were positive (14.50 nmol/L). During his hospital stay, he presented upper gastrointestinal bleeding. Gastroscopy showed an ulcer affecting the lesser curvature. Anatomical pathology study of the ulcer was compatible with intestinal-type gastric adenocarcinoma. Subtotal gastrectomy was performed surgically. After 12 months of follow-up in which the patient tolerated treatment with capecitabine and pyridostigmine, imaging tests showed multiple liver nodules compatible with tumour implants. The patient died 3 years later.

Case 3. A 70-year-old woman presenting ocular MG. She had undergone surgical treatment for breast cancer more than 10 years before. Results for anti-AChR antibodies were positive (4.01 nmol/L).

Although the association between MG and thymoma is widely recognised, the relationship between MG and other neoplasms remains unclear. Different studies suggest an increase in risk of cancer among MG patients which ranges from 1.7% to 15.4%. In contrast, this risk is estimated at 2.78% for the general population.[4] The variability among studies may be due to the heterogeneity of samples and follow-up times for MG patients.[2,5,6] The study with the largest sample size to date, 2614 MG patients, showed an increased risk of extrathymic neoplasm incidence of 1.38 compared to a control cohort during a follow-up period of 8 years. Incidence in the general population is 4.82 new cases of extrathymic neoplasms per 1000 inhabitants per year.[7]

This increased tendency to present cancer, found in many other autoimmune diseases,[8–10] is due to an immune dysregulation that elicits both the autoimmune cascade and limits the defensive response to cancer cells. Studies do not show a temporal association between cancer and MG, or associations with any specific tumour type. This cannot therefore be regarded as a paraneoplastic phenomenon, unlike the case of small cell lung cancer in Eaton-Lambert syndrome.[1,11] Liu et al. reported that although MG patients presented a higher risk of presenting extrathymic malignancies, they showed no specific susceptibility to certain malignancies.[7] That team showed that the most frequent extrathymic malignancy was breast cancer, which is also true in the general population. Rather than being a direct relationship, the association consists of an increased risk of neoplasms at different locations, even with wide time intervals, as we observed in cases 1 and 3.

Of the different extrathymic malignancies in MG patients, we can categorise haematological malignancies as especially frequent.[12–15] Causes may be secondary to immune-suppressing treatments or, as some studies highlight, due to an intrinsic involvement of lymphocytes which undergo chronic stimulation, a process that in turn increases the probability of mutations.[16] Finally, we should highlight that no cases of MG associated with simultaneous gastric cancer have been reported to date.

We should not forget this increased risk, especially among the subgroup of older patients who present more severe clinical manifestations or thymoma, or those on immunomodulatory treatment.[2,17] Therefore we suggest using cancer screening methods in MG patients, bearing in mind those already used in the general population. Doctors must ensure that they are performed correctly and watch closely for any warning symptoms.

In conclusion, our data suggest that extrathymic malignancies may be associated with MG. Whether or not co-presence of MG and other extrathymic malignancies represents a real association has yet to be confirmed. Meanwhile, we should consider whether it is necessary to review cancer screening methods, especially in the case of patients with generalised late-onset MG who are treated with immunomodulatory drugs.

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