myocardial dysfunction developed in our patient after the administration of doxorubicin in a single dose well below that typically associated with cardiotoxic effects. The rapid improvement in left ventricular function observed in this patient within four weeks suggests that substantial myocardial stunning was present. Although it is very rare, acute reversible left ventricular failure should be considered in patients in whom respiratory failure or shock develops after the administration of even a single dose of doxorubicin.

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Cabergoline plus Lanreotide for Ectopic Cushing's Syndrome

TO THE EDITOR: The ectopic corticotropin syndrome, a rare cause of chronic endogenous hypercortisolism, accounts for 15 to 20 percent of corticotropin-dependent Cushing's syndrome and 5 to 10 percent of cases of Cushing's syndrome overall.[1,2] This syndrome is often associated with corticotropin-secreting lung carcinoid tumors. The treatment of choice in cases in which the syndrome is associated with lung carcinoid is surgery, but the success rate of surgery is limited owing to the persistence of tumor remnants,[3] which frequently necessitate palliative medical treatment to inhibit adrenal cortisol secretion. Somatostatin analogues have been observed to be effective in controlling carcinoid corticotropin secretion[4]; in contrast, dopamine agonists have not been used in treatment of the ectopic corticotropin syndrome. In this report, we describe a patient with the ectopic corticotropin syndrome due to a lung carcinoid tumor. After surgery failed, the condition was successfully managed with a long-acting somatostatin analogue, together with a long-acting dopamine agonist.

A 35-year-old man had a clinical picture suggestive of the ectopic corticotropin syndrome related to a carcinoid tumor; biochemical and hormonal tests confirmed the diagnosis. Somatostatin-receptor scintigraphy revealed abnormal uptake in the anterobasal region of the left lung, and computed tomography (CT) revealed a lung tumor. Thoracotomy was performed, and the presence of a corticotropin-positive, atypical carcinoid tumor was confirmed. After surgical removal of the tumor, Cushing's syndrome persisted, with increased plasma cortisol levels and increased urinary cortisol excretion. Somatostatin-receptor scintigraphy showed persistently abnormal uptake in the left lung, although chest CT revealed no abnormalities. Since reoperation was not an option, therapy with the somatostatin analogue lanreotide (90 mg per month) was begun, on the basis of the positive findings on scintigraphy. After six months, corticotropin and cortisol secretion decreased but then stopped responding to treatment, and after one year, the lanreotide therapy was stopped. Since reverse-transcriptase–polymerase-chain-reaction analysis of somatostatin-receptor and dopamine-receptor expression in a tumor sam-

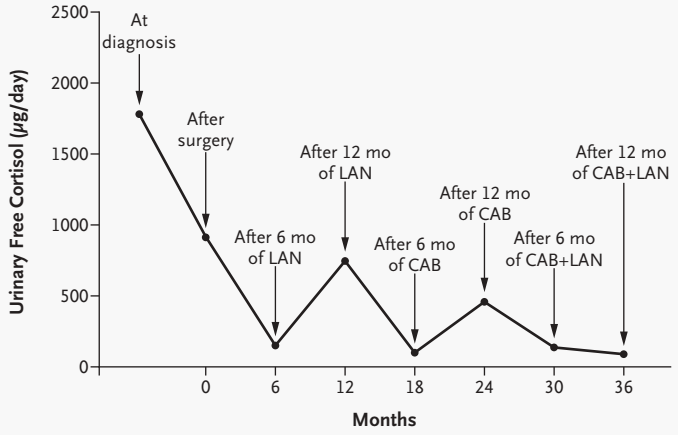

Figure 1. Urinary Cortisol Levels after Various Treatments in a Patient with the Ectopic Corticotropin Syndrome Associated with a Corticotropin-Secreting Lung Carcinoid.

LAN denotes lanreotide, and CAB cabergoline.

ple revealed dopamine D2 receptor expression in addition to expression of somatostatin receptor subtype 5, dopamine-agonist therapy with cabergoline (7 mg per week) was initiated. After six months, corticotropin and cortisol secretion normalized but then stopped responding again, and the administration of cabergoline was stopped after one year. In a final attempt at medical therapy, combined treatment with cabergoline and lanreotide was started on the basis of the documented interaction between the dopamine D2 receptor and the somatostatin receptor subtype 5.[5] Corticotropin and cortisol secretion rapidly normalized and remained normal, as did plasma corticotropin and urinary cortisol levels (Fig. 1).

This case documents the long-term effectiveness of combined treatment with a somatostatin analogue and a dopamine agonist in a patient who no longer had a response to either agent alone and supports the hypothesis that somatostatin and dopamine receptors interact and that somatostatin and dopamine agonists may potentiate actions.

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