

DISCUSSION

Illumination of malignant tissue containing photosensitizers such as PII with light of an appropriate wavelength initiates a "selective" photochemical reaction with the formation of reactive oxygen species and other radicals, leading to selective tumor necrosis. Skin photosensitivity is the only potential side effect, as current sensitizers are also retained in the skin and strongly absorb UV light.

This case report confirms earlier reports that PDT can achieve a complete response of early-stage intraluminal lesions. The extent of PDT necrosis is known to be <9 mm deep, as penetration of 628-nm wavelength in tissue is limited. Considering the circumstances of this patient, PDT provided him with an alternative treatment for NSCLC, without causing delay in the treatment schedule of his leukemia.

REFERENCES


An Uncommon Case of Brainstem Tumor With Selective Involvement of the Respiratory Centers*

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We report a clinical case of a young man with a brainstem tumor with a stable alveolar hypoventilation syndrome as the only symptom of the disease. The ventilatory response to \( CO_2 \) was almost absent and the ventilatory pattern during tidal breathing was very irregular. The diagnosis was made by magnetic resonance imaging of the brain and confirmed by a stereotactic brain biopsy specimen.

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The neoplastic diseases of the central nervous system produce symptoms and signs depending on two main factors: the local destructive effects of the tumor and the increasing intracranial pressure. The main symptoms and signs include the following: seizures, symptoms of raised intracranial pressure (eg, vomiting, mental torpor, sphenicteric incontinence), and focal symptoms and signs that point to a single area of the brain; changes in control of breathing are usually not observed in early stages of the disease.

CASE REPORT

A 24-year-old white man with \( \beta \)-thalassemia minor was referred to our examination for evaluation of respiratory failure, hypertension, and erythrocytosis. The patient complained of sleep disorders (restlessness, sudden awakenings, enuresis) and diurnal sleepiness that impaired working efficiency and interpersonal relationships. On physical examination we found the following: mild cyanosis; irregular respiratory rate and continuously changing tidal volume; systolic murmur at the apex and at the left base of the heart; hepatomegaly; and splenomegaly. The arterial blood pressure was 220/120 mm Hg. Results of neurologic examination were normal: no abnormality was found as regards mental functions, analysis of gait, cranial nerves, and motor, reflex, and sensory function of the arms, trunk, and legs.

The hematocrit was 44 percent, hemoglobin was 14 g/dl, erythrocyte count was 8,010,000/mm\(^3\), mean corpuscular volume was 17 pg, mean corpuscular hemoglobin concentration was 31 g/dl, leukocyte count was 6,900/mm\(^3\), and platelet count was 290,000/mm\(^3\). The iron serum level was 30 \( \mu \)g/dl; the total iron binding capacity was 426 \( \mu \)g/dl, and the serum ferritin level was 29.5 ng/ml. HbA\(_2\) was 5.1 percent. The bone marrow biopsy specimen showed a delayed maturation of erythroid precursors and a leukoblast/erythroblast ratio of 0.3. Echocardiography did not reveal any heart disease associated with cyanosis. The pulmonary function test did not show a restrictive or obstructive pattern.

The arterial blood gas measurement breathing room air showed a PaO\(_2\) of 53 mm Hg, a PaCO\(_2\) of 66 mm Hg, a pH of 7.29, and an alveolar-arterial Pa\(_O_2\) gradient of 18.1 mm Hg. During voluntary ventilation, we found a PaO\(_2\) of 83.5 mm Hg, a PaCO\(_2\) of 37 mm Hg, a pH of 7.455, and an alveolar-arterial Pa\(_O_2\) gradient of 22.7 mm Hg. The ventilatory response to CO\(_2\) according to the method of Read; was almost absent (\( \Delta VE/\Delta PCO_2 = 0.157 \) L/min Hg). During spontaneous ventilation, we observed a remarkable irregularity of respiratory rate and tidal volume without apneas (Fig 1). Computed tomography (CT) of the head revealed a mild increase of the brainstem diameter.

During the clinical course, the patient had four critical episodes of apnea and coma with fast and spontaneous resolution. One of these episodes happened during a conversation. On that occasion, we found coma of grade 2, bilateral miosis, irregular squinting of the left eye, and irregular foot movements. A new CT of the head showed a reduction of subarachnoid spaces and confirmed a mild increase of the brainstem volume.

Magnetic resonance imaging of the brain revealed an increased T2 signal from the lower part of the pons involving the floor of the fourth ventricle, which also appeared deformed (Fig 2). A stereotactic brain biopsy was performed and the diagnosis of fibrillary astrocytoma, grade II, was made. Because of its location and uncertain delimitation, surgical resection of the tumor was not attempted.

Afterwards, two episodes of coma and pulmonary edema occurred, and mechanical ventilation was necessary. During a radiation therapy treatment, the patient had an increasing, mainly inspiratory, dyspnea that led to asphyxia. Indirect laryngoscopy showed reduced symmetrical mobility of the vocal cords, which appeared adducted. Laryngeal stratigraphy did not show any com-
pressive mass.

One month later another episode of coma occurred. Mechanical ventilation was started again; it was not possible to stop it until the patient died because of disturbances of coagulation and heart rhythm.

DISCUSSION

The tumor probably started some years before the appearance of a clear clinical picture. The initial functional effect was a sleep apnea syndrome that escaped detection for a long time. Owing to the slow evolution of the neoplasm, the control of breathing was probably modified first during sleep, then also during wakefulness, leading to a stable alveolar hypoventilation.

The hypoxia, due to the hypoventilation, increased the erythropoiesis. However, this patient had a normal value of hemoglobin (14 g/dl) and a low level of serum iron because of several venesections performed in other hospitals to reduce the erythrocytosis.

The spontaneous ventilation showed an irregular activity, without any periodic breathing pattern. This finding could be due to a marked change of the brainstem respiratory reticular structures, with a consequent loss of integration between the stimuli.

The vocal cord paralysis was probably due to an involvement of the neurons of the nucleus ambiguus.

Recently a case has been reported of a 4-year-old girl with a ganglioglioma involving the cerebellum and pons with CO₂ retention and arterial O₂ desaturation during both wakefulness and sleep. However, the child was obese and neurologic examination showed a remarkable right-sided hemiparesis and dysmetria, whereas in our patient the most common neurologic changes induced by brainstem tumors were not present.

REFERENCES


Dextroposition of the Left Lower Lobe After Heart-Lung Transplantation*

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Immediately after heart-lung transplantation for cystic fibrosis, a patient had development of a right lower lobe retrocardiac density that persisted on all postoperative chest radiographs. A computed tomographic examination of the thorax performed 3 weeks after surgery showed that there was partial collapse of the left lower lobe in the right hemithorax. The patient required a posterolateral thoracotomy for cure. (Chest 1993; 103:1910-12)

Many of the abnormalities visible in the chest radiographs of heart-lung transplant patients are familiar findings such as interstitial and alveolar changes, atelectasis, pneumothorax, pleural effusions, and mediastinal widening. We

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