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Acute effects of combined photodynamic therapy and hyperbaric oxygenation in lung cancer -
A Clinical Pilot Study

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Background and Objective Photodynamic tumor therapy (PDT) is based upon a photochemical reaction that is limited by the availability of molecular oxygen in the target tissue. The use of hyperbaric oxygenation (HBO) increases the amount of oxygen available for the process may thereby enhance the efficacy of PDT. We investigated the acute effects on tumor stenosis after combined PDT/HBO.

Patients and Methods Thirty patients (22 males, 8 females, mean age: 68.8 years; range: 44–78 years) with inoperable non-small cell bronchogenic carcinoma and endobronchial stenosis were studied prospectively. Photosensitization was carried out using a hematoporphyrin-derivative 2 mg/kg BW 48 hours prior to PDT. The light dose was calculated as 300 J/cm fiber tip. The assessment of outcome 1 and 4 weeks after PDT/HBO was performed by endoscopy, chest X-ray, spirometry, laboratory parameters, subjective report of dyspnea, and Karnofsky performance status.

Results At one and four weeks after the treatment, the patients felt a significant improvement of dyspnea and hemoptysis along with an objective subsiding of poststenotic pneumonia, though spirometric parameters revealed no significant difference. A significant reduction of tumor stenosis ($P < 0.05$) and an improvement of the Karnofsky performance status ($P < 0.05$) were documented 1 and 4 weeks after PDT/HBO. No therapy related complications were observed.

Conclusions Although the small number of patients does not allow to draw definitive conclusions to be drawn, the results suggests that combined PDT/HBO represents a new, safe, and technically feasible approach. It enables efficient and rapid reduction of the endoluminal tumor load and helps conditioning the patient for further treatment procedures.