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Endobronchial Intratumoral Chemotherapy (EITC): A New Modality for Palliation and Potential Curative Therapy of NSC Lung Cancer

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Lung cancer remains the most deadly and most difficult cancer to treat effectively. The standard of care for conventional treatment; radiation, systemic chemotherapy and surgery is relatively ineffective for long term survival. CDC statistics indicate a 75% increase in lung cancer mortality during the past 20 years. New concepts for enhancing quality of life and for prolonged survival are needed. Reported here is progress for a new therapeutic paradigm, intratumoral (IT) chemotherapy, a novel localized treatment modality. The procedure, endobronchial intratumoral chemotherapy (EITC) involves direct intratumoral drug injection via a needle bronchoscope. A superdose of drug is thereby made to perfuse the tumor mass and achieve rapid tumor necrosis and massive tumor cell killing. Because of the localized drug delivery, there are no systemic toxic complications with cisplatin or mitoxantrone that are normally associated with conventional IV chemotherapy. Palliation and prolonged survival have been observed clinically for EITC, especially for patients presenting with significant airways obstruction. Collaborative clinical studies has been conducted with Dr. Celikuglu, who has pioneered EITC in Istanbul, and with Dr. Hohenforst-Schmidt in Germany. Favorable clinical outcomes for EITC have now been observed for hundreds of NSCLC patients. In parallel preclinical IT chemotherapy research in Florida, using a murine Lewis lung carcinoma, mitoxantrone-loaded albumin nanomesospheres afforded prolonged IT tumoricidal activity and evidence for systemic tumor-specific immune response. Additional research indicates that IT neoadjuvant chemotherapy followed by resection of the necrotic tumor mass may afford a curative response. It is reasonable to conclude that IT chemotherapy represents an important new approach to improved lung cancer treatment.

Biography

Dr. Goldberg FAIMBE, FBSE, joined the faculty of the University of Florida as the Biomedical Program of Excellence Professor in 1975. At Florida, as part in the Departments of Chemistry and Materials Science & Engineering, he helped establish intramural graduate programs in Polymer and Biomedical Sciences. He is now also affiliated with the University's Cancer Center and the Departments of Biomedical Engineering, Pulmonology, and Pharmacology & Therapeutics. His biomedical research interests and activities for the past 35 years have been diverse with strong focus on localized chemotherapy by direct intratumoral drug injection. Pioneering cancer therapy studies were initiated in 1976 as a Visiting NIH Scientist and marked by a seminal 1978;38:1311 Lung Cancer paper on IT Chemoimmunotherapy. Subsequent research was devoted to enhancement of intratumoral chemotherapy using drug-loaded albumin and DNA nanomesospheres as reviewed in JPP 2002;54;159-180. Recent clinical research has been focused primarily on bronchoscopic intratumoral injection of chemotherapy with Drs. Seyhan and Firuz Celikoglu and Dr. Wolfang Hohenforst-Schmidt as reported in Cancer Therapy 2008;6:545-552 and JPP 2010;62:287-295. Dr. Goldberg is the senior author of more than 425 published and presented papers and is on the editorial boards of numerous journals.