Hepatic and Renal Impairment: Patients with hepatic or renal impairment may need longer precautionary measures for photosensitivity.
Thromboembolism: Thromboembolic events can occur.
Embryo-Fetal Toxicity: May cause embryo-fetal toxicity. Advise females of reproductive potential of the potential risk to a fetus and to use effective contraception.

MOST COMMON ADVERSE REACTIONS reported during clinical trials (>10% of patients) are:

Esophageal Cancer: Anemia, pleural effusion, pyrexia, constipation, nausea, chest pain, pain, abdominal pain, dyspnea, photosensitivity reaction, pneumonia, vomiting, insomnia, back pain, pharyngitis.
Obstructing Endobronchial Cancer: Dyspnea, photosensitivity reaction, hemoptysis, pyrexia, cough, pneumonia.
Superficial Endobronchial Tumors: Exudate, photosensitivity reaction, bronchial obstruction, edema, bronchostenosis.
High-Grade Dysplasia in Barrett's Esophagus: Photosensitivity reaction, esophageal stenosis, vomiting, chest pain, nausea, pyrexia, constipation, dysphagia, abdominal pain, pleural effusion, dehydration.

Other photosensitizing agents may increase the risk of photosensitivity reaction. Because of the potential for serious adverse reactions in the breastfed infant, advise patients that breastfeeding is not recommended during treatment with PHOTOFRIN and for 5 months after the last dose.

Please see accompanying full Prescribing Information for PHOTOFRIN® (porfimer sodium) for Injection at: www.photofrin.com

FOR MORE INFORMATION about PHOTOFRIN®, or if there are any questions regarding the information provided, visit **www.photofrin.com** or please contact the Medical Information Department at **1-866-248-2039**. You are encouraged to report negative side effects of prescription drugs to the FDA. Visit **www.fda.gov/medwatch**, or call **1-800-FDA-1088**.

ADP-036 08/2020

References:
1. Endo C, Miyamoto A, Sakurada A et. al. Results of long-term follow-up of photodynamic therapy for roentgenographically occult bronchogenic squamous cell carcinoma. Chest. 2009 Aug;136(2):369-75. 2. Furuse K, Fukuoka M, Kato H, et al. A prospective phase II study on photodynamic therapy with photofrin II for centrally located early-stage lung cancer: The Japan Lung Cancer Photodynamic Therapy Study Group. J Clin Oncol. 1993;11:1852-1857. 3. Edell ES, Cortese DA. Photodynamic therapy in the management of early superficial squamous cell carcinoma as an alternative to surgical resection. Chest. 1992;102:1319-1322. 4. Kato H, Okunaka T, Shimatani H. Photodynamic therapy for early stage bronchogenic carcinoma. J Clin Laser Med Surg. 1996;14:235-238. 5. Moghissi K, Dixon K, Thorpe JA, et al. Photodynamic therapy (PDT) in early central lung cancer: a treatment option for patients ineligible for surgical resection. Thorax. 2007;62:391-395.

PDT with PHOTOFRIN® [porfimer sodium] for injection

PINNACLE BIOLOGICS™

Roentgenologically Occult Squamous Cell Carcinomas of the Lung

Courtesy of Hiren J. Mehta, MD
Assistant Professor of Medicine
Division of Pulmonary, Critical Care, and Sleep Medicine
University of Florida

Patient History

This 67-year-old male with a long-standing history of cough and dyspnea on exertion presented with hemoptysis for 4 days. The hemoptysis was non-massive, but expectoration was approximately 5 mL, 3 times per day. After resolving spontaneously, he denied any other symptoms, such as weight loss or fatigue. His past medical history included diabetes, hypertension, and Chronic Obstructive Pulmonary Disease (COPD).

Examination

Physical examination revealed a healthy-appearing male in no distress, although he had distant breath sounds bilaterally. Chest CT suggested emphysema but did not reveal any specific findings to account for the patients' hemoptysis. Pulmonary Function Tests (PFTs) confirmed a severe obstruction with GOLD Stage III COPD.

Diagnostic Evaluation

Fiber optic bronchoscopy was performed to inspect the airway and identify the cause of the patient's hemoptysis. Results were within normal limits except for mucosal irregularity (approximately 8 mm in diameter) at the proximal end of the left lower lobe bronchus, above the origin of the superior segment (Figure 1). The mucosal irregularity was more prominent on narrow band imaging (Figure 2). Endobronchial biopsies were performed from the lesion and were consistent with squamous cell carcinoma in situ, without any evidence of involvement of deeper layers.

BRONCHOSCOPIES

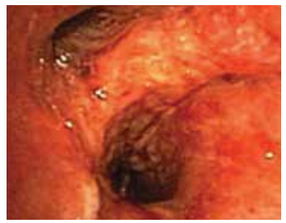

Figure 1 – Mucosal abnormality at the proximal end of left main bronchus.

Figure 2 – Left lower lobe lesion with narrow band imaging.

See important prescribing and safety information for PHOTOFRIN® (porfimer sodium) for Injection on pages 3 and 4.

Course of Treatment

The patient's case was reviewed at the multidisciplinary chest tumor board. Due to his poor functional capacity, surgery was not an option, so he was presented with options of photodynamic therapy (PDT) with PHOTOFRIN® (porfimer sodium) for Injection versus continued bronchoscopic surveillance. Argon plasma coagulation (APC) was also pursued as an alternative approach, however was not strongly considered due to lack of evidence for treatment of squamous cell carcinoma in situ with APC. The patient and his family chose PDT.

The patient received the standard 2 mg/kg of PHOTOFRIN® (porfimer sodium) for Injection intravenously, with sunlight precautions initiated. Subsequent bronchoscopy was performed under moderate sedation. Under direct visualization, a 25-mm cylindrical fiber was advanced adjacent to the lesion at the energy setting of 200 Joules/cm for 8 minutes and 20 seconds with a nominal wavelength of 630 nm ± 3nm (Figure 3).

Forty-eight hours later, a second session using a similar technique was performed. A third bronchoscopy was performed revealing necrotic debris along the treatment site and suggesting a positive treatment effect (Figure 4). The debris was suctioned and debulked. All PDT sessions were performed on an outpatient basis.

BRONCHOSCOPY

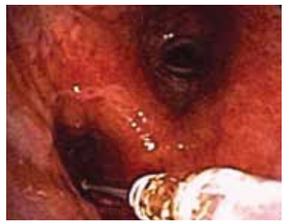

Figure 3 – Laser fiber placed adjacent to the lesion.

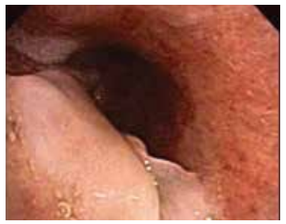

Figure 4 – Necrotic debris post-PDT suggesting positive treatment response.

Clinical Outcomes

For surveillance, the patient received bronchoscopy every 6 months for 2 years with narrow band imaging. Each time, endobronchial biopsies were also performed at the treatment site, which were concluded to be negative for malignancy. Accordingly, the patient was considered cured of his squamous cell carcinoma in situ and surveillance was discontinued.

Discussion

While surgical resection is an effective treatment modality for roentgenologically occult bronchogenic carcinomas, there are many patients for whom surgery and radiotherapy are not indicated. PDT with PHOTOFRIN® (porfimer sodium) for Injection is not only minimally invasive, but it is also associated with low treatment related morbidity and has a high initial complete response rate to therapy.[1-5] Therefore, in our experience, PDT may be considered a treatment modality for patients with roentgenologically occult squamous cell carcinomas of the lung that are:

– bronchoscopically visible
– have tumor lengths of ≤1 cm
– have no radiologic findings on computed tomography imaging

See important prescribing and safety information for PHOTOFRIN® (porfimer sodium) for Injection on pages 3 and 4.

Patients undergoing PDT should be carefully monitored. Most recurrences of carcinoma in situ following PDT can be adequately treated with surgery, radiation therapy, and repeat administration of PDT.

The information contained in this case study has been supplied by the medical professional whose name appears here. The advice, opinion, statements, materials and other information expressed and contained in this case study are from the authors and reflect their personal experience with the specific patient. Results may vary. Pinnacle Biologics, Inc. makes no claim that similar treatment will result in a similar outcome.

PHOTOFRIN® (porfimer sodium) for Injection Indications

Palliation of patients with completely obstructing esophageal cancer, or of patients with partially obstructing esophageal cancer who, in the opinion of their physician, cannot be satisfactorily treated with Nd:YAG laser therapy.

Treatment of microinvasive endobronchial non–small cell lung cancer (NSCLC) in patients for whom surgery and radiotherapy are not indicated.

Reduction of obstruction and palliation of symptoms in patients with completely or partially obstructing endobronchial NSCLC.

Ablation of high-grade dysplasia (HGD) in Barrett's esophagus (BE) patients who do not undergo esophagectomy.

Important Safety Information About PHOTOFRIN® (porfimer sodium) for Injection

PHOTOFRIN® should not be used in patients with porphyria, existing tracheoesophageal or bronchoesophageal fistula, tumors eroding into a major blood vessel, emergency treatment of patients with severe acute respiratory distress caused by an obstructing endobronchial lesion because 40 to 50 hours are required between injection of PHOTOFRIN® and laser light treatment, and esophageal or gastric varices or esophageal ulcers >1 cm in diameter.

IMPORTANT WARNINGS AND PRECAUTIONS USING PHOTOFRIN® INCLUDE:

Gastroesophageal Fistula and Perforation: Do not initiate PHOTOFRIN with photodynamic therapy (PDT) in patients with esophageal tumors eroding into the trachea or bronchial tree or bronchial wall.
Pulmonary and Gastroesophageal Hemorrhage: Assess patients for tumors eroding into a pulmonary blood vessel and esophageal varices. Do not administer light directly to an area with esophageal varices.
High-Grade Dysplasia (HGD) in Barrett's Esophagus (BE): After treatment of HGD in BE, conduct endoscopic biopsy surveillance every 3 months, until 4 consecutive negative evaluations for HGD have been recorded.
Photosensitivity and Ocular Photosensitivity: Observe precautions to avoid exposure of skin and eyes to direct sunlight or bright indoor light for at least 30 days. Instruct patients when outdoors to wear dark sunglasses which have an average light transmittance of <4% for at least 30 days and until ocular sensitivity resolves.
Use Before or After Radiotherapy: Allow 2-4 weeks between PDT and subsequent radiotherapy.
Chest Pain: Substernal chest pain can occur.
Airway Obstruction and Respiratory Distress: Administer with caution to patients with tumors in locations where treatment-induced inflammation can obstruct the main airway. Monitor patients closely between the laser light therapy and the mandatory debridement bronchoscopy for any evidence of respiratory distress.
Esophageal Strictures: Esophageal strictures can occur.