

Photodynamic Therapy: Establishing Its Role in Palliation of Advanced Esophageal Cancer

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See Article on Page 278-284

Photodynamic therapy (PDT) is a unique treatment modality that uses photosensitizers activated by light. Photosensitizers accumulate in malignant tissue, and light energy is used to destroy cancer cells by production of activated oxygen [1]. There are three main steps in PDT: injection of photosensitizers, activation of photosensitizers by endoscopy-guided red light application, and cell death by production of active oxygen [2]. PDT is comprised of three separate components: the photosensitizer, light source, and light delivery system [3].

PDT was first used in the treatment of esophageal cancer in the 1980s [4]. Since then, its indications have been broadened to include treatment of gastric cancer, biliary cancer, colon cancer, and other non-gastrointestinal malignancies such as skin cancer and lung cancer. Of course, the treatment of choice in esophageal cancer is surgical or endoscopic resection of the malignant tissue. In reality, 40% to 50% of patients diagnosed with esophageal cancer have a cancer lesion that is not completely resectable [5]. Therefore, when disease cure is not expected, palliation with improvement in the patient's quality of life becomes the next priority. In advanced esophageal cancer, the biggest problem arising from esophageal lumen obstruction

by the ingrowing tumor mass is dysphagia and difficulty maintaining sufficient nutritional support. For palliation of esophageal cancer, many treatment modalities have been used, such as dilation of the lumen with self-expanding metallic stents (SEMS), radiation therapy, chemotherapy, brachytherapy, and argon plasma coagulation. Of all of these treatment methods, insertion of a SEMS into the esophagus has been the primary treatment and is a widespread practice [6]. Nevertheless, restenosis of the esophageal lumen due to tumor ingrowth and overgrowth warrants an additional procedure or another treatment modality.

In the current article entitled "Role of photodynamic therapy in the palliation of obstructing esophageal cancer," the authors describe the effect of PDT as part of a multimodal treatment strategy for palliation of esophageal lumen obstruction in advanced esophageal cancer [7]. They enrolled 20 patients with obstructive esophageal cancer who all had dysphagia. After primary treatment with PDT, the patients were given additional treatment with external beam radiation therapy or SEMS for palliation of dysphagia, which was the main goal of the treatment. The results of the study showed significant improvement of dysphagia, numerically described as the "dysphagia score." Only two of the total enrolled patients showed major complications (i.e., esophageal stricture), and these patients were treated by placing a stent across the stricture. The authors

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achieved a mean dysphagia-free interval of 81 days.

Although the study was a non-randomized, single-arm study, the results are very promising. Improvement of the dysphagia score in 90% of patients indicates that a better quality of life was achieved by most of the patients who received PDT as part of the multimodal treatment. Other recent studies have stated that PDT can be used as an effective treatment modality in combination with other techniques, such as stents and radiation therapy for palliation of obstructive esophageal cancer, alleviating dysphagia [8-10]. These results, including those in the current article, show that PDT is becoming established as a treatment of lumen-obstructing advanced esophageal cancer.

In terms of treating difficult lesions, PDT has a significant advantage, compared with stents, in treating advanced esophageal cancer. When the lesion is located at the cervical esophagus, which can cause a foreign body sensation and pain, or at the gastroesophageal junction, when stent migration and symptoms due to reflux can frequently occur, PDT can be an appropriate solution. Indeed, PDT is more expensive than other treatment modalities. In the future, studies comparing the cost-effectiveness of PDT with other techniques such as stents are warranted. To achieve a better effect and gain more ground in terms of treatment indications, new photosensitizers with fewer side effects and light delivery systems allowing for deeper penetration are needed. With improvement in procedure equipment and further larger, randomized trials, the status of PDT, as an established therapeutic choice in the treatment of cancer, will be confirmed.

Conflict of interest

No potential conflict of interest relevant to this article is reported.

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