

Photodynamic Therapy: A Safe and Effective Treatment for Tumor Overgrowth in Patients with Oesophageal Cancer and Metal Stents

Initial clinical trials have shown that metal stents are ideal for treating dysphagia in patients with inoperable malignant oesophageal obstructions (1). However one major problem is tumor overgrowth and ingrowth in noncovered metal stents, while new covered metal stents can prevent tumor ingrowth. Tumor overgrowth can be treated by Neodym-YAG-laser application which is very effective but bears a high risk for destroying the metal stent (2). We used photodynamic therapy (PDT) in an 83-year-old woman with dysphagia due to proximal oesophageal cancer. In order to palliate her dysphagia, a noncovered metal stent (Strecker Nitinol-Stent; Boston Scientific, USA) had been inserted. Three months after the insertion procedure, restenosis occurred due to tumor overgrowth (Figure 1) which required further treatment. The stenosis was very close to the upper oesophageal sphincter, and placement of a second overlapping stent appeared to be difficult and dangerous. After prior sensitization with 2.0 mg/kg hematoporphyrin i.v. (Photosan-3; Seehof Laboratorium, Wesselburenkoog, Germany), PDT was performed 48 hours later using a fibre connected to a light-diffusing cylinder (3) as well as a bare fibre. The cylinder had a length of 20 mm and a diameter of 8 mm and could be easily placed within the stenosis. The red light (wavelength 630 nm) was delivered by an argon pumped-dye laser using 150 J/cm² and 100 mW for each treated area. Since the total length of the stenosis was only 2 cm, the light-irradiated area was extended from 1 cm below to 1 cm above the stenosis. The total length of 4 cm was treated in two steps. A 200 µm bare fibre was inserted into a separate tumor nodule above the stenosis and treated by interstitial PDT. Dysphagia improved three days after therapy, and a control endoscopy after one week revealed tumor necrosis and ulceration in the region of the previous stenosis (Figure 2). Protected from daylight no side effects during or after the treatment were noticed, especially no sunburn due to the high skin photosensitivity. Skin photosensitivity was assessed after the i.v. photosensitization with Photosan-3 by irradiating the back of the patient with different light doses of UVA, which showed nearly normal values after six weeks. The patient had no symptoms for more than four months when dysphagia reappeared. At this time symptoms were relieved by balloon dilatation. In vitro experiments indicated that the cover of the new coated metal stents (Wallstent; Schneider, Bülach, Switzerland) was not damaged using energy doses up to 500 J/cm² and a power of 250 mW. We suggest that PDT is another treatment modality in tumor overgrowth of coated and noncoated metal stents.

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Figure 1: Tumor overgrowth of a metal stent with circumferential tumor growth and obstruction of nearly the entire lumen.



Figure 2: Endoscopic appearance of the stenotic area one week after PDT. There are necrotic areas with ulceration at the site of the previous stenosis, which is now passable with the endoscope.

References

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