Office-Based Transurethral Devascularisation of Low Grade Non-Invasive Urothelial Cancer Using Diode Laser. A Feasibility Study

Frequent recurrence of non-muscle invasive bladder tumours (NMIBC) requiring transurethral resection of bladder tumour (TUR-BT) and lifelong monitoring makes the lifetime cost per patient the highest of all cancers. A new method is proposed for the removal of low grade NMIBCs in an office-based setting, without the need for sedation and pain control and where the patient can leave immediately after treatment. An in vitro model was developed to examine the dose/response relationship between laser power, treatment time, and distance between laser fibre and target, using a 980 nm diode laser and chicken meat. The relationship between depth and extent of tissue destruction and the laser settings was measured using microscopy and non-parametric statistical analysis. A patient with low grade stage Ta tumour and multiple comorbidity, and therefore not fit for general anaesthesia, had a tumour devascularised using the laser at the tumour base, in the outpatient department. The tumour was left in the bladder. In the in vitro model, depth of tissue destruction increased with laser illumination up to 30 seconds, where median depth was 4.1 mm. With longer illumination the tissue destruction levelled off. The width of tissue destruction was 2–3 mm independent of laser illumination time. The in vivo laser treatments devascularised the tumour, which was later shed from the mucosa and passed out with the urine in the days following treatment. Pain score was 0 on a visual log scale (0–10). The tumour had completely disappeared two weeks after treatment. This diode laser technique may provide almost pain-free office-based treatment of low grade urothelial cancer using flexible cystoscopes in conscious patients. A prospective randomised study will be scheduled to compare the technique with standard TUR-BT in the operating theatre. Lasers Surg. Med. 47:620–625, 2015. © 2015 Wiley Periodicals, Inc.