

Long-term treatment of peri-implant lesions in geriatric dentistry

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[PICTURE: ©PRIVILEGE]

_Introduction

In recent years, photodynamic therapy has gained many new users in laser dentistry, giving it an enormous push forward. This therapy is minimally invasive and long-lasting. A multitude of scientific studies on the therapy have been conducted and it has a uniform nomenclature, established during the last meeting of the DGL (German Association for Laser Dentistry). During this meeting, the difference between "real" photodynamic therapy and one whose sensitiser has its own (antibacterial) properties was established. The following case report describes the minimally invasive use of a photodynamic therapy system with a green sensitiser in geriatric dentistry (treatment of peri-implant lesions).

_Real photodynamic therapy: Sensitiser with intrinsic effect

In treatments with real photodynamic therapy, cell death of the pathogenic bacteria is achieved exclusively by the interaction between sensitiser and laser light, which generates oxygen, resulting in destruction of the pathogenic cell. A further differentiation can be made with regard to sensitisers that use blue (usually with antibacterial properties) and those that use green (usually without antibacterial properties) dyes. Systems with green sensitisers are undoubtedly the focal point of current interest. They are generally indocyanine green (ICG) based and activated with an 810 nm (diode) laser (near infrared).

_Indocyanine green-based sensitisers for photodynamic therapy

ICG is a recognised active substance that has been standard in ophthalmology, as well as in oncology, dermatology and veterinary medicine, for years. If irradiated with a low-energy laser of a wavelength of 810 nm, it promises a successful therapy for periodontitis and peri-implantitis.

_Case report

Eleven years ago, the now 79-year-old female patient had received implants in the mandible. After several years of total satisfaction with the implant provision, she experienced the first complications. While initially limited to the superstructure (small chips on the ceramic and loosening of the superstructure), problems with the actual implants had increased in the past three years and recurring infections, sometimes painful, and bleeding when brushing her teeth, etc. arose. Local and systemic antibiotics only yielded short-lived improvement, and she was then referred to our practice.

The first superficial intra-oral examination revealed clinical findings clearly indicative of a diagnosis of peri-implantitis:

- massive peri-implant bone loss;
- bowl-shaped defect; and
- pain on probing the soft-tissue sleeve.



Fig. 1_Within the scope of a full-mouth disinfection, both of the implants affected by peri-implantitis and the remaining teeth of the mandible were treated with ICG-based photodynamic therapy.

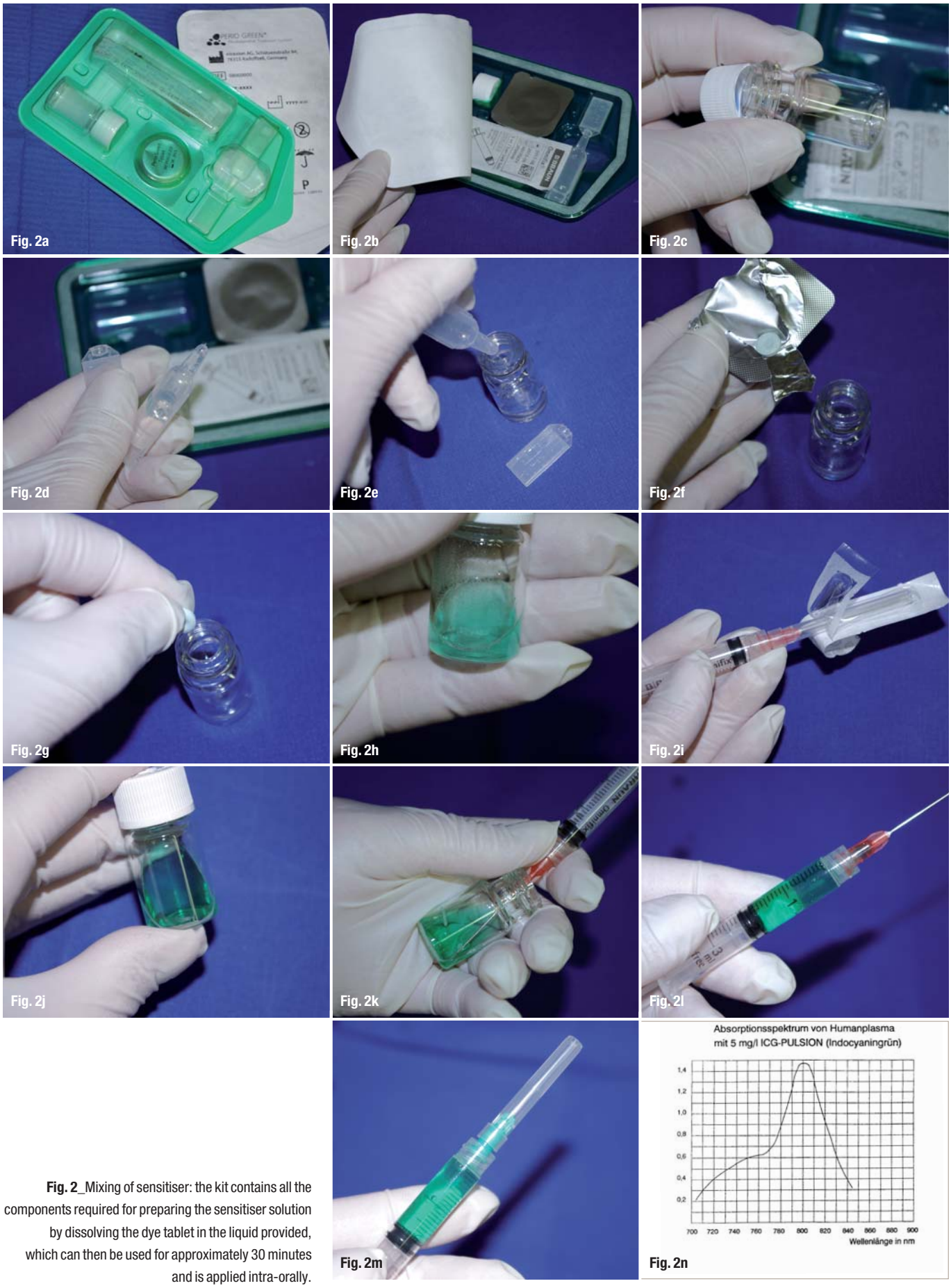


Fig. 2_Mixing of sensitiser: the kit contains all the components required for preparing the sensitiser solution by dissolving the dye tablet in the liquid provided, which can then be used for approximately 30 minutes and is applied intra-orally.

The X-ray confirmed the initial clinical diagnosis: it was a case of full peri-implantitis. One implant in the left half of the mandible had loosened from the bone to the extent that no more than half of the titanium surface that had originally been covered by the implant was still osseointegrated. An explantation with subsequent augmentation and re-implantation later could have been considered for this artificial abutment tooth.

Already at this early stage of decision-making, the family doctor and internal medicine specialist vetoed any procedures with increased risk of bleeding, increased risk of bacteraemia and a high degree of invasiveness owing to the patient's highly compromised physical condition. With these justified restrictions, photodynamic therapy was the obvious choice for treatment.

An ICG-based sensitiser (Perio Green, elexxion) in combination with an 810 nm diode laser (100 mW, pulsed) was used (Fig. 1). This is a photodynamic therapy system with matched components. The sensitiser is made up immediately prior to treatment by dissolving a dye tablet in the liquid included in the kit and then applied intra-orally (Fig. 2). The application of a low-viscosity light-green sensitiser, which requires a directed droplet-flow technique, is quite demanding compared with high-viscosity blue sensitisers. After application and a period of exposure, the laser fibre is inserted into the target area and the tissue is then irradiated with a low-energy diode laser (810 nm). The persistent colouring of the gingiva that is often observed when using other sensitisers does not occur after completion of treatment. No residue of the dye is visible intra-orally after rinsing several times.

An intra-oral follow-up examination was carried out at one and four weeks. The patient was, and is to date, without any symptoms. To maintain this situation, she is scheduled for recalls every three months, with every recall entailing a professional cleaning and photodynamic therapy for every second recall (Fig. 3).

Since, the patient is now almost completely without symptoms for the first time in years, but no improvement is to be expected with regard to her general health, we decided on this minimally invasive maintenance therapy. Regarding the commitments associated with it, the patient concluded very matter-of-factly, "To me, it is worth it".

_Conclusion

In my opinion, photodynamic therapy is a minimally invasive option compared with conventional methods. It is ideally and most effectively used with a verified treatment protocol and a sensitiser without an intrinsic effect. Photodynamic therapy has become my treatment of choice for patients with compromised health, for whom more invasive therapy options would be more difficult or impossible to implement, and for patients with a risk of bacteraemia._

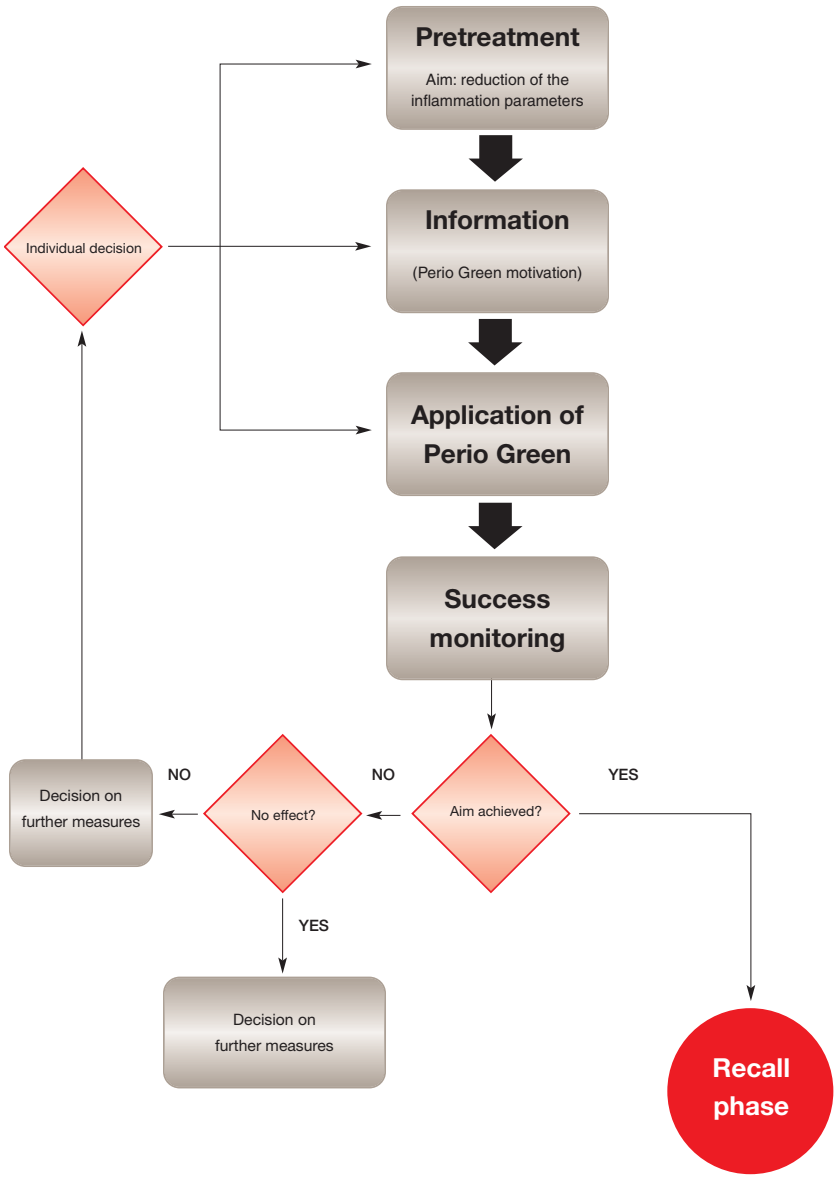


Fig. 3_Treatment regimen of ICG-based photodynamic therapy using Perio Green.

_contact laser

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