

Magnetic resonance imaging (MRI) controlled outcome of side effects caused by ionizing radiation, treated with 780 nm-diode laser -- preliminary results.

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BACKGROUND and OBJECTIVE: Ionizing radiation therapy by way of various beams such as electron, photon and neutron is an established method in tumor treatment. The side effects caused by this treatment such as ulcer, painful mastitis and delay of wound healing are well known, too. Biomodulation by low level laser therapy (LLLT) has become popular as a therapeutic modality for the acceleration of wound healing and the treatment of inflammation. Evidence for this kind of application, however, is not fully understood yet. This study intends to demonstrate the response of biomodulative laser treatment on the side effects caused by ionizing radiation by means of magnetic resonance imaging (MRI). **STUDY DESIGN/PATIENTS and METHODS:** Six female patients suffering from painful mastitis after breast ionizing irradiation and one man suffering from radiogenic ulcer were treated with $\lambda=780$ nm diode laser irradiation at a fluence rate of 5 J/cm². LLLT was performed for a period of 4-6 weeks (mean sessions: 25 per patient, range 19-35). The tissue response was determined by means of MRI after laser treatment in comparison to MRI prior to the beginning of the LLLT. **RESULTS:** All patients showed complete clinical remission. The time-dependent contrast enhancement curve obtained by the evaluation of MR images demonstrated a significant decrease of enhancement features typical for inflammation in the affected area. **CONCLUSION:** Biomodulation by LLLT seems to be a promising treatment modality for side effects induced by ionizing radiation.