

# Randomized clinical trial of the influence of local water-filtered infrared A irradiation on wound healing after abdominal surgery

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## Abstract

**Background:** Postoperative local water-filtered infrared A (wIRA) irradiation improves tissue oxygen partial pressure, tissue perfusion and tissue temperature, which are important in wound healing.

**Methods:** The effect of wIRA irradiation on abdominal wound healing following elective gastrointestinal surgery was evaluated. Some 111 patients undergoing moderate to major abdominal surgery were randomized into one of two groups: wIRA and visible light irradiation (wIRA group) or visible light irradiation alone (control group). Uncovered wounds were irradiated twice a day for 20 min from days 2–10 after operation.

**Results:** Irradiation with wIRA improved postoperative wound healing in comparison to visible light irradiation alone. Main variables of interest were: wound healing assessed on a visual analogue scale (VAS) by the surgeon (median 88.6 versus 78.5 respectively;  $P < 0.001$ ) or patient (median 85.8 versus 81.0;  $P = 0.040$ ), postoperative pain (median decrease in VAS score during irradiation 13.4 versus 0;  $P < 0.001$ ), subcutaneous oxygen tension after irradiation (median 41.6 versus 30.2 mmHg;  $P < 0.001$ ) and subcutaneous temperature after irradiation (median 38.9 versus 36.4°C;  $P < 0.001$ ). The overall result, in terms of wound healing, pain and cosmesis, measured on a VAS by the surgeon (median 79.0 versus 46.8;  $P < 0.001$ ) or patient (79.0 versus 50.2;  $P < 0.001$ ) was better after wIRA irradiation.

**Conclusion:** Postoperative irradiation with wIRA can improve normal postoperative wound healing and may reduce costs in gastrointestinal surgery.