

# A Two Center Prospective Controlled Clinical Safety and Efficacy Study of 980 nm Diode Laser with Novel Energy Regulation and Visualization Technology for Laser Assisted Liposuction

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**Background:** Laser Assisted Lipolysis (LAL) is a relatively new method for removing localized accumulations of fat under local anesthesia. Controlled Laser Assisted Lipolysis (CLAL) is a new technique allowing the control in real-time of the position of the cannula inside the fat layer and the delivery of energy. This clinical prospective study aims to compare LAL versus CLAL while demonstrating the contribution of novel visualization and control in energy delivery.

**Study Design:** Twenty four subjects were treated by February 2010 using a 980nm-diode laser (Lipocontrol, Osyris Medical). The LipoControl integrates a magnetic tracking of the position of the cannula inside the fat layer. For each location (thighs, abdomen, man breast, buttocks, flanks), one side was treated conventionally with LAL (control functions were disabled or masked), the other side with CLAL (the surgeon had access in real-time to the control functions). For both sides, energy mappings were recorded.

**Results:** The average area size was  $408 \pm 157 \text{ cm}^3$ . For areas equivalent in terms of location and depth, mean energy delivered as well as the energy distribution varied significantly between the LAL and CLAL sides. Recorded doses varied between  $32 \text{ J/cm}^3$  and  $94 \text{ J/cm}^3$ . Notable variations of the distributed energy were observed on the LAL side. Evidently, some areas were left untreated (16%  $\pm$  10%) whereas other areas were overdosed 27%  $\pm$  8%. On average, localized energy excess of 176%  $\pm$  123% compared to the average value were measured on the LAL side. Conversely, on the CLAL side, the entire area was treated. Localized energy excess were limited to 62%  $\pm$  32% compared to the average value. Averaged tissue reduction observed at one week and one month was 7.1%  $\pm$  8% and 11.4%  $\pm$  9% respectively. All subjects demonstrated rapid recovery without complications. Less pain was reported on CLAL side.

**Conclusion:** The real-time display of the energy delivery inside the fat layer is a major advantage of CLAL as it provides the surgeon with the possibility to fully control the treatment while optimizing treatment outcomes. This study suggests that the energy is delivered much more homogeneously and safely using CLAL. Further comparative clinical evaluations of optimal energy dosage are warranted.