

# Effects of Aesthetic Abdominoplasty on Abdominal Wall Perfusion: A Quantitative Evaluation

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Abdominoplasty procedures involve a high risk of early complications, including hematomas, seromas, necrosis, and wound-healing problems. Their rationale is evident from the vascular anatomy of the abdominal wall, as traditional abdominoplasty includes a division of the main perforating vessels. No studies exist to quantitatively assess the consequences of abdominoplasty on the perfusion of the random pattern abdominal flap. To address this issue and quantify the influence of classic abdominoplasty on the perfusion of the abdominal skin, the authors performed a prospective clinical trial including 15 low-risk patients undergoing abdominoplasty for aesthetic purposes. Perfusion of the abdominal flap was measured intraoperatively using the technique of dynamic laser-fluorescence-videoangiography. In the region between the umbilicus and the transverse scar (zone 1), the increment of fluorescence (the slope of the intensity curve during inflow of the indocyanine green) was recorded and compared with the intensity curve of normal tissue that was not involved in surgery (thoracic wall). The results of the intraoperative indocyanine green perfusography showed a significant impairment of the vascular supply of zone 1 in all patients. The mean perfusion index in this region was 17.2 percent (range, 5 to 32 percent) of the perfusion of the surrounding skin that was not involved in surgery. The complication rate was 33 percent (five patients) and included two cases of hematoma and three cases of scar dehiscence with skin and/or fat necrosis. These data indicate that conventional abdominoplasty including extended undermining and division of the superficial and the deep arterial systems causes profound devascularization of the abdominal flap. This might explain the high incidence of complications following this procedure. (*Plast. Reconstr. Surg.* 114: 1586, 2004.)

Functional abdominal lipectomy was first described by Kelly in 1899,<sup>1</sup> and was popularized for cosmetic purposes in 1967 by Pitanguy.<sup>2</sup> He

introduced the low transverse incision, which could be concealed in the so-called bikini line and enabled the surgeon to remove all previous lower abdominal scars. Since then, an increasing number of patients seeking truncal rejuvenation have made abdominoplasty a very popular procedure. In 1998, there were 46,597 abdominoplasties performed in the United States.<sup>3</sup> This represents an increase of 177 percent from the 16,810 procedures reported in 1992.<sup>3</sup>

Although the Pitanguy procedure is associated with inconspicuous scars and a high rate of patient satisfaction, the complication rate associated with this kind of surgery is considerable. In the most recent survey of 199 consecutive abdominoplasties, an occurrence of minor complications of 32 percent and an overall revision rate of 43 percent were reported.<sup>4</sup> In smokers without additional risk factors a complication rate as high as 52 percent was reported. The complications were related primarily to wound healing and included hematomas, seromas, skin slough, infection, and wound dehiscence. They almost always involved the abdominal skin below the umbilicus. Similar complication rates following abdominoplasty have been found by Floros and Davis<sup>5</sup> and by Uchelen et al.<sup>6</sup> (34.6 percent and 29.2 percent, respectively).

Interestingly, a common finding of most surveys is the lack of correlation between the incidence of complications and the experience

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