

# Results of abdominoplasty by electrodissection and short-term complications

CATSE REPORT

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## Abstract

**Objective:** To describe abdominoplasty by electrodissection technique for improving short-term complications.

**Design:** A prospective controlled study consisting of 100 consecutive female candidates for abdominoplasty by electrodissection employing spray-coagulation was conducted. The technique and electrical current used are described in detail.

**Results:** Intraoperative bleeding ranged from 25 to 160 ml, (median 85 ml). The short-term specific and general complication rates were very low, not exceeding the rates observed using cold scalpel. The frequency of seroma was 24% and the occurrence of seroma, total seroma volume, and total suction tube discharge were correlated to the area of dissection or depth of electrical tissue injury.

**Conclusion:** Despite the relatively high frequency of seroma, we recommend the use of spray-coagulation for abdominoplasty because bleeding is minimized, visibility during dissection is highly increased and the rate of short-term complications is very low.

**Keywords:** Abdominoplasty, electrodissection, bleeding, complications, seroma.

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## Introduction

Since the 1970s, electrocautery has become a widespread surgical tool to raise the flaps and excise breast specimen to perform bloodless mastectomy [1].

However, both experimental and clinical deleterious effects of electrocautery on wound healing and infection have been frequently reported [2-3].

Numerous evidences on the role of electrocautery in wound complications, especially seroma formation, have been reported [3,4,5]. Seroma is defined as the serous fluid collection under the skin flaps and dead space, which can eventually result in flap necrosis, wound dehiscence, delay in recovery, and adjuvant treatment, and usually requires repeated needle aspirations. Seroma fluid contains immunoglobulin, granulocytes, and leukocytes, but few lymphocytes, suggesting that it is a wound exudate rather than lymphatic fluid [6]. Although pro-inflammatory cytokines are known to increase in wounds after trauma [7,8], there have been only a few studies on the accumulation of cytokines in human wounds [9] and wound fluids [10-11].

## Materials and methods

A total of 100 women aged 32-52 years (median age:43years) with ptosis and relaxing abdomen after child-bearing were included in the present study.

All abdominoplasts were performed by one surgeon, while pathological examination, including evaluation of wound areas and extent of electrical tissue injuries, was conducted by one pathologist. The wound areas were evaluated by considering the tissue specimen as a cylinder with an elliptical basis. Thus, the maximum and minimum depth, height, and circumference of the tissue specimen were measured. Furthermore, the length and depth of the tissue specimen fat were also determined. The extent of tissue injury was estimated for each specimen by measuring the mean value in millimeters of basophil discoloration of the resection margin in six randomly taken tissue blocks from the deep resection margin using an ocular micrometer. The intraoperative blood loss was estimated by the weight of the sponge, and the difference between pre- and postoperative hemoglobin levels was determined. Seroma was explicitly investigated and verified by close drain aspiration. Wound infection was defined as the accumulation of pus requiring

debridement. Hematoma was defined as the accumulation of blood in the operative field needing surgical evacuation. Mortality was defined as death within the first 30 postoperative days. General complications were clinically diagnosed.

## Surgical procedure

The skin related to inferior crises was incised with a scalpel. The subcutaneous tissue was divided with spray-coagulation and tractioned down to the superficial layer of Scarpa's fascia followed by the development of skin flaps. Spray-coagulation was also employed for stripping the fascia from the abdominal wall muscles. A suction tube was exteriorized through the flap. The tube was removed when the discharge was serous and less than 20 ml at 24 h, but not later than the seventh postoperative day. The subcutaneous tissue was approximated with resorbable sutures, and subcutaneous suture technique was applied for the skin. Occlusion of the space beneath the skin flaps was not attempted, and prophylactic antibiotics were not administered.

## Results

General complications, mortality, and wound dehiscence were not observed. A total of 83 patients had a completely uneventful postoperative course. In another 10 patients, remarkable hyperemia of the skin flaps lasting for 3-4 days was observed. In only one of these patients, a positive culture of *Staphylococcus aureus* from the drain fluid was obtained, and the patient was successfully treated with antibiotics. Furthermore, wound infection requiring surgical debridement was observed in one patient, hematoma was noted in one patient, and minute flap margin necrosis or epidermiolysis was observed in two patients.

A total of 24 patients developed seroma. The patients who developed seroma were aspirated 1-9 times (median: 3 times). The total aspirated volume ranged from 10 to 250 ml (average: 150 ml). **Ta-**

**ble 1** shows the volume of intraoperative bleeding, the difference between pre- and postoperative hemoglobin levels, the calculated wound area, and the estimated depth of electrical tissue injury. Neither the calculated wound area nor estimated depth of electrical tissue injury was related to intraoperative bleeding, volume of suction tube discharge, occurrence of seroma, number of seroma aspirations, or seroma volume. The duration of abdominoplasty, i.e., “the knifETIME,” ranged from 55 to 190 min (median: 113 min). Increased experience with electrodissection shortened the duration of the entire procedure considerably.

**Table 1:** Volume of intraoperative bleeding and difference between pre- and postoperative hemoglobin.

Criteria	Median	Range
Intraoperative bleeding (ml)	85	25–160
Difference between pre- and postoperative hemoglobin (mmol/l)	−0.8	+0.8 to −2
Suction tube discharge (ml)	64	30–280
Wound area (cm )	2863	2640–3540
Depth of tissue injury (mm)	0.2	0.1–0.8

## Discussion

This study confirmed that intraoperative bleeding during abdominoplasty using electrodissection is very less. In addition, the study also showed that the short-term complication rate is quite comparable with that of traditional methods. The use of insulated scissors and computerized bipolar diathermy is safe and achieves efficacious coagulation and cutting in dermatologic surgery [12]. Although electric cutting current is less destructive, it is also less hemostatic, and indications for its use are difficult to identify [13]. Furthermore, the use of electrocautery coagulation current is associated with increased tissue damage and a significant reduction in the

tensile strength of healing wounds [14]. In addition, it has also been reported that the use of electrocautery to create surgical wounds does not increase the wound infection rates [15].

Electrosurgical midline incision in elective surgery has significant advantages over scalpel use with respect to incision time, blood loss, early postoperative pain, and analgesia requirements [16]. The use of diathermy for skin incision is as safe as the use of scalpel in terms of wound healing, and reduces analgesics requirements during the postoperative period [17, 18]. It has been reported that the use of electrocautery to create skin flaps reduced blood loss, but increased the rate of seroma formation [19]. Diathermy incision has significant advantages, when compared with scalpel because of reduced incision time, less blood loss, and reduced early postoperative pain [20]. Some studies have reported that scalpel and diathermy are similar in terms of early and late wound complications when used to perform midline abdominal incisions. Therefore, the choice of method to use remains a matter of surgeon’s preference [21].

Skin diathermy burns and wound hematomas are only observed after conventional scalpel incision, and fears of delayed wound healing, keloid formation, and high infection rates are unsubstantiated [22]. Steel scalpel or electrocautery may be used to incise the skin of patients undergoing bilateral neck dissection with no difference in cosmetic or patient satisfaction outcome. However, steel scalpel causes greater incision-related blood loss, when compared with the electrocautery blade [23].

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