



# Surgical treatment of axillary bromhidrosis by combining suction-curettage with subdermal undermining through a miniature incision

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## KEYWORDS

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Combination

**Summary** The suction-curettage technique has been widely applied in the treatment of axillary bromhidrosis. However, it can only moderately eradicate the malodor. From 2011 to 2013, we performed the suction-curettage procedure alone in 91 patients with primary axillary bromhidrosis (group A). From 2014 to 2016, we refined the suction-curettage technique by performing wide subdermal scissors undermining through a miniature incision in 80 patients (group B). Through a miniature incision at the inferior pole of the central axillary crease, the entire subcutaneous tissues containing apocrine glands were initially dissected with scissors within the axillary area and then the undermined apocrine glands were removed by suction-curettage. In group B, 87.5 percent of axillae (140/160) showed significant malodor eradication postoperatively, which was higher than the 33 percent of axillae (60/182) associated with the group A ( $p < 0.01$ ). Accordingly, patients in group B had a higher satisfaction about the procedure and life quality improvement ( $p < 0.01$ ). The overall complication rate for the group B was 13.7 percent, which was significantly higher than the 4.4 percent complication rate in the group A ( $p < 0.01$ ). By combining the suction-curettage with subdermal undermining through a miniature incision, we could achieve a higher curative effect for primary axillary bromhidrosis in comparison to the suction-curettage technique alone. The complication rate was significantly higher than the suction-curettage alone but the final result was acceptable to the patients.

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## Introduction

Axillary bromhidrosis is characterized by unpleasant body odor due to the interaction of subcutaneous apocrine glands with microorganisms on the axillary skin surface.<sup>1-3</sup> In Chinese populations, even a faint malodor could severely impair one's quality of social life.<sup>4,5</sup>

For the treatment of axillary bromhidrosis, we previously reported the surgical excision of subcutaneous apocrine glands with axillary superficial fascia through a long mid axillary crease incision. The technique could achieve effective malodor elimination but leave a conspicuous scar in axillary fossa.<sup>5</sup> From 2011, we shifted to the suction-curettage alone through a stab incision for the bromhidrosis treatment. It offers several advantages such as low complication rate, short recovery time and minimal scarring.<sup>6-10</sup> However, the ablation of the apocrine glands in suction-curettage alone is achieved through tunnels, between which there will remain tissues attaching the skin to the subcutaneous tissues. Deep to these attachments some apocrine glands may escape and cause the persistence of the malodor postoperatively.

From 2014, we began to perform the suction-curettage with wide subdermal scissors undermining through a miniature incision at the inferior pole of the central axillary crease. In our hypothesis, the combined suction-curettage with subdermal undermining through a miniature incision technique could reduce the residual apocrine glands in the subcutaneous tissue and allow for a higher curative effect compared to the suction-curettage alone.

## Patients and methods

### Patients

From September 2011 to December 2013, 91 patients with primary axillary bromhidrosis were recruited in our bromhidrosis clinic and treated with the suction-curettage technique alone (group A). From January 2014 to July 2016, we modified the suction-curettage with subdermal undermining through a miniature incision and 80 patients with primary axillary bromhidrosis were treated (group B). Patients' characteristics were shown in Table 1. According to the ethical standards of our institutional ethical committee, all patients had signed an informed consent for the use of their data.

Before the operation, the degree of malodor and sweating was assessed subjectively by patients, the physician, and a third party, and scaled averagely as "none," "mild," "moderate," and "severe," respectively. The quality of life was assessed using the modified Dermatology Life Quality Index (DLQI), which was described in our previous report.<sup>5</sup> Total scores ranged from 0 to 30, with higher scores indicating lower quality of life.

After the operation, complications were checked by the surgeon and recorded. At least 6 months later, patients were followed up and invited to the clinic or telephoned to complete a satisfaction questionnaire on the surgical treatment. Specifically, the eradication of malodor, elimination of sweating, reduction in axillary hair growth and overall satisfaction about the treatment were ranked by patient as "not significant", "mild", "moderate", or "significant". The quality of life was also assessed with the use of DLQI questionnaire.

**Table 1** Comparison of patient characteristics in suction-curettage alone and suction-curettage combined with subdermal undermining through a miniature incision groups.

Variables	Group A	Group B	P value
Number of subjects	91	80	
Age range, (mean)	18-42, (20)	18-39, (21)	0.17
Sex			0.92
Female	78	69	
Male	13	11	
Malodor			0.91
None	0	0	
Mild	23	18	
Moderate	40	36	
Severe	28	26	
Sweating			0.22
None	0	0	
Mild	33	21	
Moderate	52	49	
Severe	6	10	
DQLI range, (mean)	5-20, (11)	5-22, (12)	0.29
Follow-up range, (mean)	6-36, (15)	6-36, (17)	0.13

Group A, suction-curettage alone; Group B, suction-curettage combined with subdermal undermining through a miniature incision; DQLI, Dermatology Quality of Life Index.

### Techniques

Patients were placed in the supine position with arms abducted at a ninety-degree angle to expose the axilla. After the axillary hair was shaved, the treated area that extended from 1 cm beyond the hair bearing area was marked. It would be difficult to use elastic bandages for external compressions after the operation under general anesthesia. Thus, all the procedures were performed under tumescent anesthesia only. The tumescent anesthesia solution was composed of 440 mL of normal saline, 60 mL of 2% lidocaine and 1 mL of 1:1000 epinephrine. After regular sterilization, a volume of 250 mL of tumescent solution was infiltrated subdermally into the marked area of each side.

In group A (for the suction-curettage alone), a stab incision was made at the inferior pole of the central axillary crease (Figure 1a). As many subcutaneous tunnels as possible were created using a sharp cannula with two holes (Dino Medi-Tech, China) facing down in a back-and-forth movement under the power assisted negative pressure (100 mmHg) (Figure 1b). The apocrine glands would thus be mobilized. Next, the cannula was faced upward and served as a continuous dermal curette for the ablation procedure (Figure 1c). When the skin became thin and no glandular tissue could be palpable, the curettage procedure was stopped (Figure 1d).

In the group B (for the suction-curettage with subdermal undermining through a miniature incision), a 1-cm-long incision was made at the inferior pole of the central axillary crease (Figure 2a). Through the small incision, a Metzenbaum scissor was used to undermine the entire subcutaneous tissues within the pre-marked area. Note that the thickness of the undermined skin was about 5 mm (Figure 2b). Then, a minimal trimming procedure was performed against the undermined skin with the scissor (Figure 2c). It could remove some sweat gland tissues and make the subsequent suction-curettage

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