

Local surgical treatment of primary axillary hyperhidrosis: Proposal for ideal indications based on two cases

Abstract

Primary axillary hyperhidrosis is characterized by excessive, bilateral, and relatively symmetrical sweating in the armpits, which can significantly impact the patient's quality of life, causing limitations in both work and social interactions. Its prevalence varies between 1% and 2.8% of the population, with an average onset during adolescence. Available treatments include topical therapies with aluminum chloride, systemic medications such as anticholinergics, iontophoresis, local application of botulinum toxin, and surgical approaches. Surgical treatment may consist of curettage or tangential resection of sweat glands ("shaving") using fine-tipped scissors, as well as endoscopic thoracic sympathectomy. In this study, we report the cases of two patients with primary axillary hyperhidrosis, compare two surgical techniques for the axillary approach, and suggest an ideal indication for this type of surgery.

Keywords: hyperhidrosis, curettage, surgical technique, case reports

Volume 10 Issue 3 - 2026

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Received: September 08, 2026 | **Published:** September 23, 2026

Introduction

Primary axillary hyperhidrosis (PAH) is a chronic medical condition of unknown cause, characterized by excessive, bilateral, and relatively symmetric sweating of the axillae.¹ This can have a severe impact on quality of life, emotional well-being, and social interactions.² Its prevalence ranges from 1% to 2.8% of the population, with onset typically occurring during adolescence.³

Available treatments include topical therapies with aluminum chloride, systemic medications (such as anticholinergics), iontophoresis, local botulinum toxin injections, and surgical approaches.^{3,4} Surgical treatment can range from endoscopic thoracic sympathectomy performed under general anesthesia to procedures under local anesthesia involving curettage or tangential resection (shaving) of the sweat glands using fine-tipped scissors.⁴

Surgical excision of the sweat glands may result in scarring, dark spots, and hair loss in the treated area. Cosmetic outcomes and the level of patient satisfaction depend directly on the size of the treated area. Smaller areas are optimal, as they require only a single incision.⁵

We report two cases with the aim of comparing two surgical techniques for the management of axillary hyperhidrosis (curettage and tangential resection) and proposing an ideal indication for each type of surgery.

Case 1

A 16-year-old white male patient with a history of PAH since the age of 12 and no previous history of overweight or diabetes mellitus,

had previously been treated with topical aluminum chloride. The concentration was escalated from 10% to 25%, without any clinical improvement. The Minor test (iodine-starch test) demonstrated an extensive area of sweating. Based on these findings, the patient underwent a surgical approach involving curettage of the sweat glands (Figure 1).

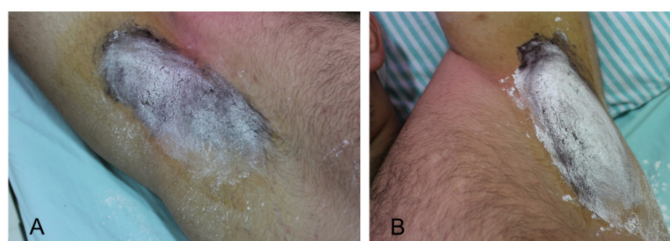


Figure 1 Case 1 undergoing Minor's test in the right (1A) and in the left (1B) axillae, showing an extensive area of sweating.

Case 2

A 17-year-old white female patient with a history of mild PAH since the age of 13, with no previous history of overweight or diabetes mellitus. She had previously been treated with 2% tannic acid and 15% aluminum chloride, with unsatisfactory symptom improvement. The Minor test demonstrated a limited area of sweating. Based on these findings, the patient underwent surgery via shaving of the sweat glands (Figure 2).

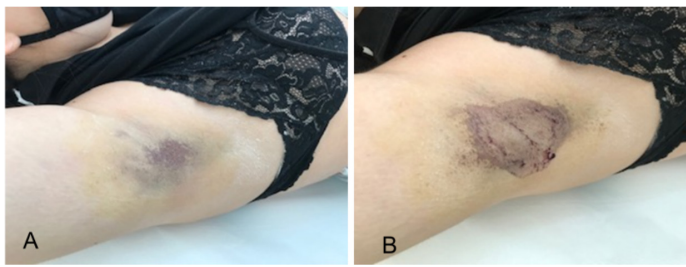


Figure 2 Case 2 undergoing Minor's test in the right axilla. Minute 1 (2A). Minute 10 (2B). The relatively limited area allows the procedure to be performed through a single incision and the use of shaving technique to achieve better outcomes.

Description of the technique used in case 1:

The patient is placed in the supine position. The Minor test is performed by applying an iodine solution to the axillae and allowing it to dry, after which starch is applied to determine the extent of involvement (Figure 1). The affected area is then marked with a surgical marker. Local cleansing is carried out with gauze soaked in normal saline to remove the starch, followed by antisepsis with povidone-iodine and the placement of surgical drapes. Anesthesia is administered using an anesthetic solution consisting of 2% lidocaine without vasoconstrictor (10 mL), normal saline (26 mL), 8.4% sodium bicarbonate (4 mL), and epinephrine 1:1000 (0.4 mL). Incisions are made with a No. 15 scalpel blade, and curettage of the sweat glands is performed using a 4-mm curette (Figure 3). Finally, the area is sutured with 4-0 monofilament nylon using simple interrupted stitches, and an occlusive dressing with gauze is applied.

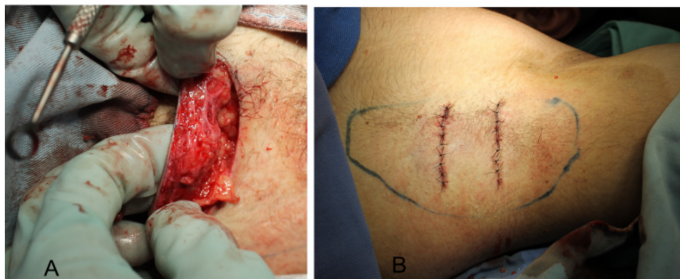


Figure 3 A. Incision and sweat glands curettage. B. Suturing after curettage. At least two incisions were required to perform curettage over most of the affected area.

Description of the technique used in case 2:

The technique was similar to the used in patient 1, except that a single incision was made in the axillary crease and the sweat glands were removed by shaving with scissors rather the curettage technique (Figure 4).

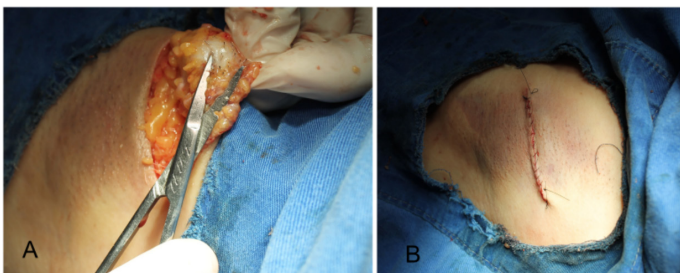


Figure 4 A. Resection using fine-tipped scissor. B. Closure of the single incision after shaving of the sweat glands.

The tissue removed during sweat gland shaving was sent for histopathological examination (Figure 5).

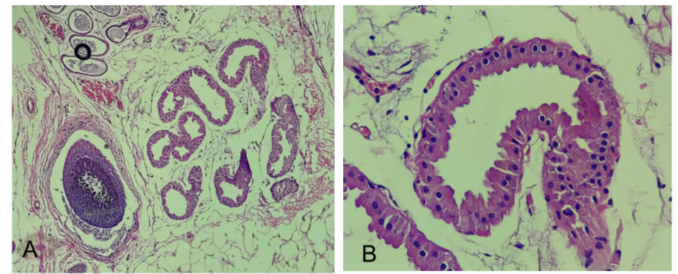


Figure 5 A. Histopathological examination showing sweat glands (H&E 10x). B. Detail of a sweat gland (H&E 40x).

Results

Both patients achieved favorable control of PAH. However, case 1 exhibited more prominent scars (Figure 6) and reported slight persistent sweating in the right axilla, as well as abdominal compensatory hyperhidrosis. In contrast, case 2 had a scar concealed within the natural axillary crease and showed no evidence of compensatory hyperhidrosis (Figure 7).

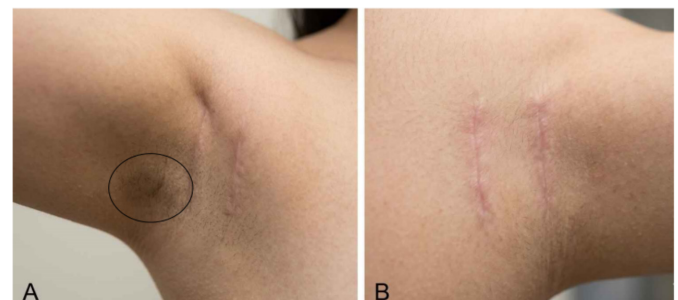


Figure 6 Case 1 at 6-month postoperative follow-up. A. A small residual area of sweating in the right axilla (Minor's test at 10 minutes). B. Close-up view of the left axilla without Minor's test, demonstrating scarring.



Figure 7 Case 2 at 1-year postoperative follow-up. Minor's test after 10 minutes on the right (7A) and left (7B) axillae, demonstrating an inconspicuous scar concealed within the axillary fold.

Discussion

Several techniques for the treatment of PAH are cited in the literature, although only surgical management provides definitive results. Thoracic sympathectomy, while highly effective for palmar hyperhidrosis, can also be utilized for the treatment of PAH, despite presenting a higher risk of developing compensatory hyperhidrosis.⁶ Minimally invasive surgeries are indicated for cases refractory to

medical therapy.⁷

Neither patient had exhausted all conservative clinical options, such as botulinum toxin injections, due to high procedural costs and the transient nature of the therapeutic effect.¹ Local excision of sweat glands—via either curettage or scissor shaving—represents a low-cost, low-risk alternative.^{5,7}

Larger areas typically require two or more incisions. In such scenarios, the use of a dermal curette is technically less demanding, as the instrument can cover greater distances from the incision site. However, repeated localized mechanical trauma associated with vigorous curettage may compromise wound healing and result in less favorable aesthetic scarring, as seen in case 1.⁵

Conversely, tangential resection of sweat glands using fine-tipped scissors is a more delicate and controlled surgical procedure, although its reach beyond the incision margin is limited. Consequently, scissor shaving is particularly suited for smaller, well-demarcated areas amenable to a single incision, yielding superior cosmetic outcomes, as demonstrated in case 2.⁷

Although aesthetic outcomes are relevant for both sexes, inconspicuous axillary scars are particularly critical for female patients,⁸ given the common use of swimwear and sleeveless clothing, combined with frequent hair removal that precludes natural scar camouflage.

Local excision of sweat glands may also provoke compensatory hyperhidrosis outside the axillary region.^{5,7} Nonetheless, because complete glandular ablation (100% removal) is rarely achieved with subcutaneous techniques, the overall incidence and severity of this phenomenon remain low. Therefore, the optimal indication for scissor shaving encompasses limited areas that can be adequately addressed through a single incision, thereby optimizing clinical outcomes. This was corroborated by case 2, who achieved an excellent cosmetic outcome without scar contracture, complete resolution of focal hyperhidrosis, and no compensatory sweating.

In this context, the localized surgical approach stands out as a highly valuable strategy, as its primary objective is the targeted elimination of eccrine and apocrine sweat glands within the subdermal layer while strictly preserving the surrounding skin integrity and shoulder mobility.⁹ Compared to definitive but more invasive alternatives like thoracic sympathectomy, local interventions eliminate the critical risk of severe systemic side effects, offering a highly favorable risk-benefit ratio for patients seeking permanent relief from axillary hyperhidrosis.⁹

Conclusion

Both sweat gland removal techniques, whether via curettage or scissor shaving, promote significant improvement in PAH. Cases involving limited areas are optimal for the fine-tipped scissor shaving technique, as they require a single incision and circumvent the reach limitations of the scissors, thereby providing superior aesthetic results.

Acknowledgments

None.

Conflicts of interest

The authors declare there is no conflicts of interest.

Funding

None.

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