

The Thoracodorsal Artery Perforator (TDAP) Flap in the Management of Axillary Hidradenitis Suppurativa

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Abstract:

Background: Hidradenitis suppurativa is a chronic inflammatory disorder of the folliculopilosebaceous units that primarily affects intertriginous regions. In severe cases, wide surgical excision is often required. The thoracodorsal artery perforator (TDAP) flap represents an optimal reconstructive option for covering post-excisional axillary defects, providing a pliable, well-vascularized, and functional coverage with minimal donor-site morbidity. This study evaluates the efficacy, safety, and both aesthetic and functional outcomes of TDAP flap reconstruction in this setting. **Methods:** A retrospective study was conducted including patients who underwent surgical treatment for stage III axillary hidradenitis suppurativa (Hurley classification) between May 2023 and May 2025 at the Department of Plastic and Reconstructive Surgery, Ibn Sina University Hospital, Rabat. Demographic data, comorbidities, and perioperative variables were analyzed. All procedures were performed during the remission phase of the disease, and postoperative outcomes were assessed clinically and functionally. **Results:** Ten adult patients (6 males, 4 females; mean age: 31 years, range: 17–45) were included. The mean follow-up period was 12 months. Wide local excision followed by TDAP flap reconstruction resulted in a significantly shorter hospital stay (4 ± 1 days) and faster wound healing (average 3 weeks). Full functional recovery was achieved after an average of 5 weeks. Only one case of partial flap dehiscence was recorded and successfully managed by secondary closure. All patients showed significant improvement in shoulder function and overall quality of life, with no recurrence observed during follow-up. **Conclusion:** The thoracodorsal artery perforator (TDAP) flap is an excellent option for the reconstruction of extensive axillary defects following wide excision of hidradenitis suppurativa. It provides durable coverage, rapid recovery, low complication rates, and improved functional and aesthetic outcomes.

Keywords: Hidradenitis Suppurativa, Thoracodorsal Artery Perforator Flap, Axilla, Reconstruction, Verneuil's Disease.

Case Report

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INTRODUCTION

Hidradenitis suppurativa (HS), also known as Verneuil's disease, is a chronic inflammatory disorder characterized by recurrent lesions affecting the folliculopilosebaceous units. The disease typically presents with nodules, abscesses, and draining sinus tracts, most commonly involving intertriginous areas such as the axillae, groins, buttocks, and perianal regions. Its chronicity, relapsing course, and the anatomical localization of the lesions make it a particularly challenging condition to manage [1].

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Axillaire reconstruction following wide excision can be technically demanding due to both the functional and anatomical constraints of the region. The use of perforator flaps,

particularly the thoracodorsal artery perforator (TDAP) flap, has emerged as a valuable reconstructive option. These flaps provide pliable, well-vascularized tissue with minimal donor-site morbidity and allow for restoration of both contour and shoulder mobility [2].

Materials and Methods:

We conducted a retrospective study including patients who underwent surgical treatment for Hurley stage III axillary hidradenitis suppurativa between May 2023 and May 2025 at the Department of Plastic and Reconstructive Surgery, Ibn Sina University Hospital, Rabat.

Patient selection and data collection:

Demographic data were collected, including age, sex, comorbidities, smoking status, and medication history. All patients were treated during the remission phase of the disease. When persistent fistulous tracts with purulent drainage were detected on clinical examination, a one-week course of preoperative antibiotics was administered until remission was achieved.

In patients with bilateral disease, surgery was performed on one side first, followed by the contralateral side after complete recovery.

Anatomy of the TDAP flap

The thoracodorsal artery is a terminal branch of the subscapular artery, which arises from the axillary artery. It gives off several cutaneous perforators—mostly musculocutaneous—that traverse the latissimus dorsi muscle to supply the overlying skin of the back. Each perforator measures approximately 0.3–0.6 mm in diameter and is accompanied by two satellite veins. These perforators can be accurately identified preoperatively using Doppler ultrasonography.

The TDAP flap provides a relatively thin and pliable skin paddle in adults of normal weight and can be easily thinned if excessive bulk is present. A skin island measuring 15 × 8 cm can usually be harvested on a single perforator, allowing for primary closure of the donor site [3].

Surgical technique:

The lateral border of the latissimus dorsi muscle was palpated and marked with a surgical pen. Perforators were identified using a handheld Doppler probe, starting approximately 6–8 cm below the posterior axillary fold and 2–4 cm medial to the lateral edge of the muscle. The most audible perforators were marked, and the flap was designed centered over them [4].

The skin paddle was outlined in an oblique, horizontal, or vertical orientation, depending on perforator location and patient preference. In women, a horizontal elliptical design was generally preferred to conceal the scar beneath the bra line.

All procedures were performed under general anesthesia with the patient in a lateral decubitus position. The dominant perforator was dissected through the muscle to its origin from the descending branch of the thoracodorsal artery. When a second perforator was encountered along the same longitudinal axis, it was also preserved.

A bipolar cautery was used throughout the dissection to ensure hemostasis. The dissection continued until an adequate pedicle length was obtained.

The muscle split was closed using absorbable sutures. The TDAP flap was then advanced over the lateral border of the latissimus dorsi to avoid muscular damage, or rotated in a propeller fashion to cover the axillary defect [5]. If the flap was excessively thick, defatting was performed after elevation.

Postoperatively, all patients were evaluated 24 hours after surgery. Adequate capillary refill was observed in all cases, with no signs of hematoma or infection. Following an uneventful recovery, patients were discharged approximately 72 hours after surgery. A follow-up evaluation performed one week postoperatively revealed satisfactory flap color, perfusion, and sensitivity, without any evidence of infection.

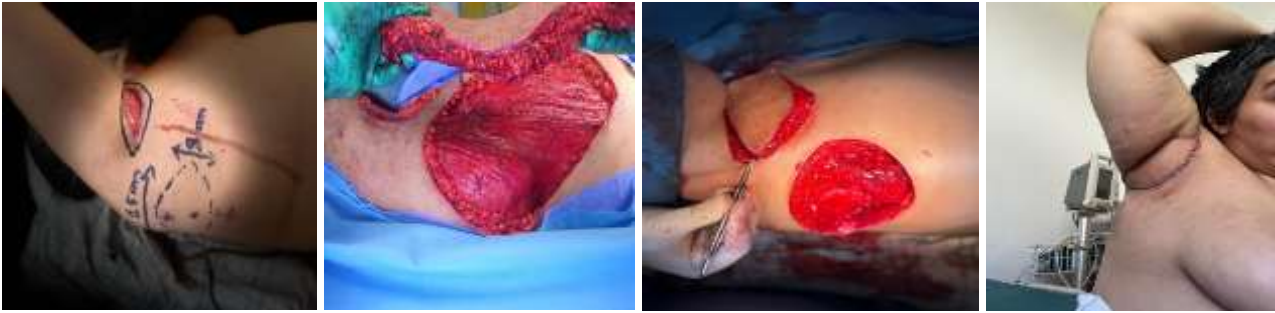


Figure 1: Pre-operative, per-operative and post-operative pictures of a 38-year-old patient who has been followed for several years for hidradenitis suppurativa involving the right axillary region, characterized by the presence of inflammatory nodules, recurrent abscesses, and fistulous tracts. Given the chronicity and severity of the lesions, surgical management was indicated



Figure 2: A 25-year-old patient who had been followed for several years for hidradenitis suppurativa (Hurley stage III) involving the left axillary region. The procedure consisted of a wide local excision encompassing all clinically affected and fibrotic tissues, with margins extending beyond the visible lesions. Reconstruction was performed using a thoracodorsal artery perforator (TDAP) flap, harvested from the ipsilateral side. A single dominant perforator was identified preoperatively using Doppler ultrasonography. The flap was elevated in the standard fashion and transferred to the axillary defect, providing well-vascularized and pliable coverage while preserving shoulder contour and mobility

RESULTS

This study included ten adult patients diagnosed with Hurley stage III axillary hidradenitis suppurativa, all of whom underwent surgical management at our Department of Plastic and Reconstructive Surgery.

The mean age of the patients was 31 years (range: 17–45 years). There were six men and four women. The mean follow-up period was 12 months.

The combination of wide local excision (WLE) followed by TDAP flap reconstruction resulted in a significantly shorter hospital stay (mean 4 ± 1 days) and a reduced wound healing time, averaging 3 weeks. The average recovery time, defined as the return to full daily and occupational activities, was approximately 5 weeks.

The overall rate of postoperative complications was low. Only one case of partial flap dehiscence occurred, which required a secondary closure procedure and healed without further sequelae. No cases of infection, hematoma, or flap necrosis were observed.

Shoulder function and quality of life were evaluated preoperatively and at one year postoperatively.

All patients demonstrated a marked improvement in both parameters. Shoulder mobility was restored in all cases, and the aesthetic appearance of the axilla was satisfactory.

Importantly, no recurrence of hidradenitis suppurativa was observed during the follow-up period.

DISCUSSION

Hidradenitis suppurativa (HS) remains a therapeutic challenge due to its chronic, recurrent nature and its significant impact on quality of life. Management relies on both medical and surgical approaches.

Topical and systemic therapies are appropriate for mild to moderate cases; however, in severe or refractory forms—particularly those with irreversible lesions—surgical excision becomes the treatment of choice.

Surgical options include healing by secondary intention, skin grafts, local random flaps, regional axial flaps, and regional perforator flaps.

A systematic review conducted by Amendola *et al.*, demonstrated that thoracodorsal artery perforator (TDAP) flaps yield superior outcomes compared with skin grafts, notably in terms of lower recurrence rates [6].

Similarly, Wormald *et al.*, Reported that patients reconstructed with TDAP flaps experienced faster recovery, fewer complications, and fewer total interventions than those reconstructed with split-thickness skin grafts. The TDAP group showed significantly better functional outcomes and improved patient satisfaction [7].

Furthermore, La Padula *et al.*, confirmed in a prospective comparative study that TDAP flap reconstruction resulted in faster recovery, fewer complications, and fewer procedures compared with direct closure, along with a greater improvement in quality of life [8].

Surgical management is therefore indicated for Hurley stage III disease, which typically involves extensive, treatment-resistant lesions requiring wide excision with margins that extend beyond the clinically active zones [6].

When comparing latissimus dorsi-based flaps, both the TDAP and the muscle-sparing latissimus dorsi (MSLD) flaps offer distinct advantages.

Although the MSLD flap can be harvested more quickly, the TDAP flap is thinner, less bulky, and generally provides superior functional comfort for the patient [9].

Elgohary *et al.*, also reported excellent results with the TDAP flap in stage II and III axillary HS, achieving 100% success rate in terms of disease eradication and complete remission during follow-up [10].

Despite a longer operative time, TDAP flap reconstruction provides a definitive and durable surgical solution that may be more cost-effective in the long term. It allows for wide excision of diseased tissue while preserving the natural diamond-shaped contour of the axilla, minimizing contracture and functional impairment.

Donor-site morbidity is minimal, and the resulting scar is generally well tolerated and easily concealed.

Compared with other local cutaneous flaps (such as V–Y advancement flaps or lateral intercostal artery perforator flaps), the TDAP flap offers tension-free closure of the defect, thanks to its long vascular pedicle and excellent arc of rotation.

Nevertheless, this technique requires a gradual learning curve, microsurgical dissection skills, and specialized training, which may limit its initial adoption in some centers.

CONCLUSION

The thoracodorsal artery perforator (TDAP) flap represents an ideal reconstructive option for extensive axillary defects following wide excision of hidradenitis suppurativa. It offers durable, well-vascularized coverage with minimal donor-site morbidity, while maintaining the contour and function of the axillary region.

This technique allows for rapid recovery, low postoperative complication rates, and a significant reduction in pain and patient discomfort. Moreover, it provides excellent functional and aesthetic outcomes, making it a reliable and definitive solution in the surgical

management of advanced hidradenitis suppurativa.

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