

Our Experience in Using Lateral Chest Flap to Treat Axillary Hidradenitis Suppurativa

Salim Al Lahham, MD*[†]
 Ghanem Aljasseem, MD*
 Rand Y. Omari, MD*
 Fatma Kilic, MD*
 Zaki Alyazji, MD*
 Ruba Sada, MD[‡]
 Ayman A.H. Asnaf, MD*
 Sara Mostafa, MD*
 Habib Albasti, MD*

Background: Hidradenitis suppurativa is a chronic inflammatory condition that affects apocrine gland-bearing areas, causing abscesses and sinuses. Multimodality treatment is suggested for management. The surgical option is becoming more widely used, especially in drug-resistant cases. In this article, we describe a series of bilateral axillary hidradenitis cases which we treated with wide local excision and immediate reconstruction with lateral chest flap.

Methods: Fourteen patients presented to our clinic with bilateral hidradenitis suppurativa of the axilla. The cases were all resistant to medical treatment. They were managed by excision and simultaneous reconstruction with lateral chest flaps.

Results: At 3 months postoperatively, all patients had full shoulder range of motion and were completely satisfied with the aesthetic outcome, except for one patient who complained of the bulky look of his axilla. Liposuction was performed for him, with a pleasant resultant outcome.

Conclusions: Our patients underwent wide local excision of bilateral disease plus reconstruction with lateral chest flaps in the same session. Our aim was to introduce a treatment option for moderate to severe axillary hidradenitis suppurativa that offers good aesthetic and functional outcomes. (*Plast Reconstr Surg Glob Open* 2022;10:e4569; doi: 10.1097/GOX.0000000000004569; Published online 11 October 2022.)

INTRODUCTION

Hidradenitis Suppurativa (HS) is a chronic inflammatory disease that affects all aspects of a patient's life. The estimated prevalence of HS varies from 0.05% to 4.10%.^{1,2} Patients usually present with painful and inflamed nodules, abscesses, and pus-discharging sinus tracts, which typically occur in apocrine-gland-bearing areas like the armpits, groin, and gluteal and perianal regions. The frequent pus discharge and unpleasant odor have a significant negative effect on the patient's well-being.³

Despite the availability of multiple medical treatment modalities, severe cases have little or no response, making surgery the mainstay of treatment.^{4,9,10} Surgical management of HS is complex and requires a multidisciplinary approach.^{11,12} Refractory cases require surgical

excision and wide debridement of the involved tissues. The options of reconstruction after excision follow the reconstructive surgery ladder, which includes healing by secondary intention, split thickness skin grafting, or flap coverage.

In this article, we describe our experience in treating HS of the axilla with excision and simultaneous locoregional lateral chest flap coverage. We aimed to shine the light on the advantages of using this reconstructive method when compared with other options mentioned in the literature.

METHODS

We included 14 patients who presented to our clinic from January 2017 to May 2021 with the complaint of severe bilateral axillary hidradenitis (Hurley stage III) for a mean period of 7 years. Our patients tried different treatment modalities for extended periods of time but showed a poor response; therefore, they were referred to us by their dermatologists. At the time of definite surgery, there was no acute infection (abscess, cellulitis, etc) in any of the cases. The method of treatment used was extensive debridement and excision of axillary glands corresponding to the borders of axilla bilaterally, with immediate reconstruction using lateral chest flaps. They received a full course of antibiotics for 7 days starting from the day of surgery. They were discharged home when drain output

From the *Plastic and Reconstructive Surgery Department, Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar; [†]Fellowship in Hand Reconstruction and Microsurgery, Ganga Hospital, India and DAFPRS Fellowship, the Netherlands; and [‡]CPESE, Hamad Medical Corporation, Doha, Qatar.

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was less than 10 mL. Most of the patients are still following our clinic except for those who left the country. The mean follow-up period was 1 year.

Six months after the procedure, the aesthetic outcome was measured through asking the patients how they rate the appearance of their scars (unsatisfactory—satisfactory—good), and the functional outcome was measured through assessing the shoulders' range of motion (restricted range of motion versus full range of motion).

SURGICAL TECHNIQUE

Complete excision of the affected axillary skin and subcutaneous tissue to the level of the axillary fascia was performed. Marking of the transpositional lateral chest flap was then performed. The designed flap should lie between the anterior and posterior axillary lines and should not cross the subcostal margin inferiorly. The flap size was chosen slightly bigger than the defect with the biggest flap measuring 20 × 10 cm. Dissection was performed in a subfascial plane starting from the distal tip using bipolar diathermy and tenotomy scissors. The dissection was continued to a point where we were able to mobilize the flap to cover the defect, bearing in mind that most of the perforators that supply this flap traverse the fascia at the level of the third intercostal space. In the cases where we needed to go above this level, the thoracodorsal artery perforators were the main supply to the flap; below this level more perforators contribute to the vascular supply of the flap. We used the Doppler to identify and mark the thoracodorsal artery perforator that emerges 2 cm posterior to the posterior axillary line at its superior end, and to know our limitation of proximal dissection in case we needed more mobility of the flap. However we did not have to reach that level in any of our cases. The flap was fixed to the defect using 2-0 Vicryl subcutaneous interrupted stitches and simple interrupted suturing of the skin. The donor area was closed primarily in two layers in all cases, and a drain was placed on each side (Fig. 1).

RESULTS

The patients were all men with a mean age of 33.7 years. Mean operative time was 45 minutes for each side. Thirteen patients had complete healing of the donor and recipient sites without any further intervention, and one patient required re-suturing because of significant wound gapping. Flap necrosis, contractures, and lymphedema did not occur with any patient.

A total of four patients who are smokers had wound gapping, three of them did not require any intervention and had complete healing within three weeks, and one patient needed re-suturing, as he suffered from hematoma due to immature removal of the drain.

No wound infection was encountered with any case. Mean in-hospital stay was three days, and patients were able to return to work after 2 weeks.

At six months postoperatively, all patients had rated their cosmetic results as good, and all of them had full

Takeaways

Question: What is the optimal treatment of severe axillary hidradenitis?

Findings: No recurrence for the studied time with good cosmetic and functional results.

Meaning: Wide excision and immediate reconstruction with locoregional (lateral chest) flap is a reliable option.

range of motion of the shoulder joints without contractures (Fig. 2). The only noted complaint was bulkiness at the base of the flap in one patient, which was treated with liposuction to flatten the area with satisfactory results. Our mean follow-up period for the patients was 1 year, and no recurrences were noted (Table 1).

DISCUSSION

Hidradenitis suppurativa (HS) is a chronic inflammatory disease of the apocrine sweat glands, which usually get activated around the age of puberty.^{14,24} It is classified into mild, moderate, and severe according to the Hurley clinical staging system.^{15,16} Stage III is the most severe form of the disease, which is described as combined lesions with tunnel formation, scarring, and inflammation.²⁴

HS is mainly diagnosed through clinical examination based on the nature and site of the lesions, in addition to the disease course.^{17,18} The treatment objectives are to manage the existing lesions, prevent new lesions, and minimize the psychological morbidity that is associated with the disease.¹⁵ Treatment options vary from pharmacological to surgical, in addition to lifestyle modifications. The selected option should be tailored according to the disease severity and the patient's condition.⁵⁻⁸

Pharmacological options depend on the severity of the disease. In mild or moderate cases, a long course of antibiotics can be sufficient. In severe and antibiotic-resistant cases, anti-inflammatory or immunosuppressive therapy can be used with many associated drawbacks, such as marked side effects, long treatment course, and high rates of relapse after the end of the course.¹⁷

The surgical option comes into play in the most severe and resistant cases for which the pharmacological treatment fails to provide any improvement. Current surgical procedures for treating HS include cryo-insufflation, incision, and drainage, derofing, skin-tissue-saving excision with electrosurgical peeling, and wide surgical excision.¹⁹

Wide surgical excision includes removal of the visible lesions plus an area of surrounding disease-free tissue.³ It has the advantage of lower recurrence rate compared with other techniques.²¹ The defect that results from this excision can either be reconstructed or left for secondary intention healing, which has a long postoperative recovery time.²⁰ Primary closure is not an option when performing wide surgical excision; however, it still has a role in limited disease.

A split thickness skin graft (STSG) can be used to cover the defect after excision; it has the advantage of

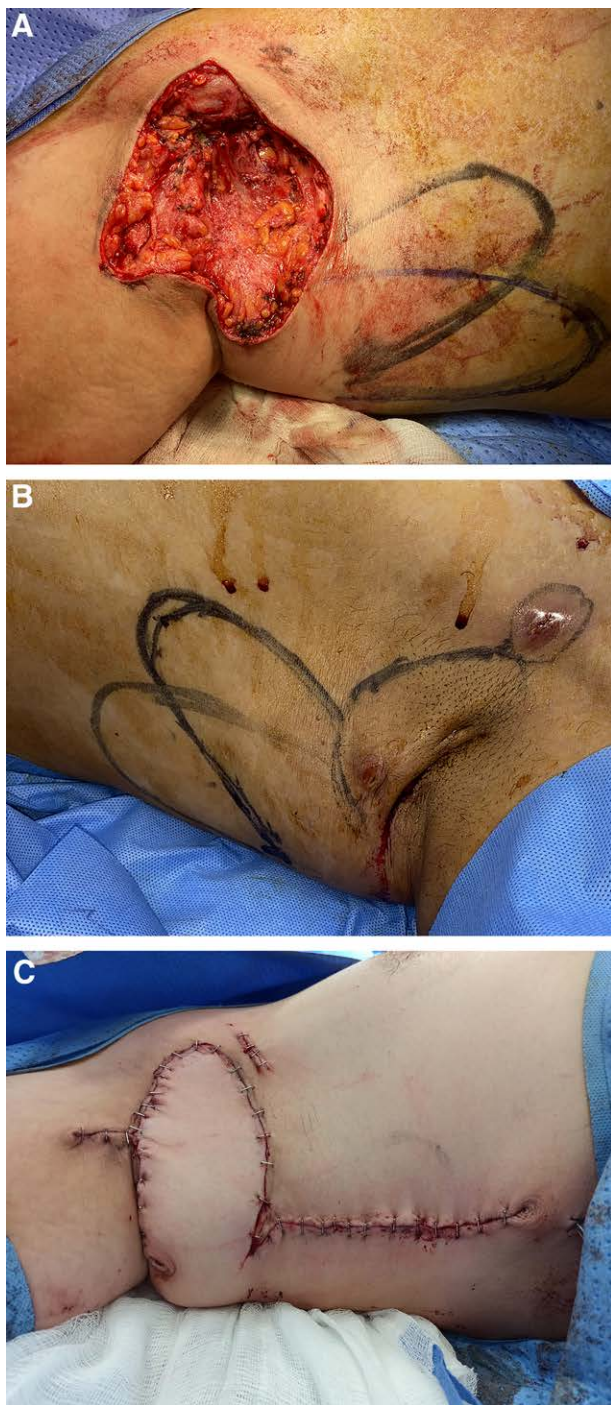


Fig 1. Illustrating the excised surface (A), marking of the flap (B), and the end result after reconstruction (C).

less recovery time and low recurrence rate compared with secondary intention healing.¹³ Its disadvantages include the prolonged period of immobilization required postoperatively, which may result in contractures—the less cosmetically appealing outcome when compared with locoregional flaps (which replace the defect with similar tissue), and the added donor-site morbidity such as delayed healing and insightful scarring. Some authors

attempted applying negative pressure therapy over the graft to increase the intake and others advocated the use of a bilayer dermal regeneration template to improve cosmetic outcomes.³⁰ In a case study, Pearce et al used STSG to reconstruct the defects post excision for seven patients with HS. They reported no failure with acceptable functional and cosmetic outcomes. However, the mean in-hospital stay was 10 days with more than one operation, and they were inclined to apply negative pressure dressing for a couple of days.²⁷ Comparing this with our method of immediate reconstruction with a locoregional lateral chest flap, we achieved a significant decrease in the in-hospital stay.

Flaps are the optimum reconstructive option because they replace the defect with look-alike tissue with good padding and excellent cosmetic results. Functionally, they are better than skin grafts because they require less recovery and immobilization time, which in turn leads to less contracture incidence. Fasciocutaneous V-Y flaps, Limberg flaps, musculocutaneous flaps, and perforator flaps like the thoracodorsal artery perforator flap and circumflex scapular artery perforator flap have been used for the reconstruction of the axilla after excision of HS.^{24,26}

Afhsarfard et al compared the use of STSG with random parascapular flap in reconstruction post resection. Their report showed no difference in terms of pain, patient satisfaction, or range of motion. In contrast to our way of immediate reconstruction, they delayed the reconstruction for 2–3 weeks post resection to obtain good granulation tissue in their method.²⁸

The lateral chest (thoracic region) flap was described by Bhattacharya et al in 1990 as a choice of regional reconstruction.³¹ The flap is supplied by multiple perforators that traverse the deep fascia at the level of the third intercostal space. In our series, we used this flap for immediate reconstruction of the defect caused by the resection of the affected areas. The advantages of using this flap include its reliability because of the abundant blood supply, its ease of dissection, having to do a one stage surgery, replacing like-to-like tissues, and the ability to perform primary closure of the donor site.²⁹

The thoracodorsal artery perforator (TDAP) flap is a modified form of the lateral chest flap where the flap is raised on a specific vascular pedicle. It is a relatively new option in reconstructive surgery. It has been used as a pedicled flap for the reconstruction of regional soft tissue defects, including the trunk, axilla, and breast. It has also been used as a free flap in reconstruction of distant tissue defects such as the face, elbow, forearm, and lower extremity. Advantages of the TDAP flap include simultaneous flap elevation, relative ease of dissection, minimal donor-site morbidity, and constant vascular anatomy with a long pedicle.²³ It is described for the reconstruction after wide excision of axillary hidradenitis in different forms (Island, Propeller, V-Y) with encouraging results.

Wormald et al compared the use of TDAP versus a skin graft after wide local excision of severe axillary hidradenitis. According to their results, TDAP was superior to the use of skin graft in terms of improving recovery time, fewer postoperative complications, shorter follow-up periods, and



Fig 2. Three months postoperative photographs showing acceptable scarring with no recurrence and full range of shoulder abduction (A-D).

better postoperative quality of life.²⁵ Busnardo et al focused on the functionality gains after axillary reconstruction with TDAP during their study. They observed a mean increase of 54 degrees in arm abduction in their treated patients.²⁹

Our approach in treating axillary hidradenitis corresponds to the recommendations in the literature. Wide excision with 1–2 cm safe margins is key to remove all the diseased hair follicles and apocrine glands. In our cases, we extended the excision more to include the whole axillary region to help reduce the rate of recurrence and need for further excisions. It is worth mentioning that there was no acute infection (abscess, cellulitis, etc) in any of the cases; if this was the case, then the patient should be treated with a course of antibiotics till the infection subsides, to minimize the risk of postoperative surgical site infection. Patients were left with big raw areas; our mean defect size was around 10×8.6 cm. We opted to reconstruct the raw areas in the same surgery to minimize hospital stay and fasten recovery time, which helps avoid future contractures and gives a cosmetic advantage.

We used the lateral chest flap described earlier as a reliable way of reconstruction. Care must be taken not to cross the subcostal margin inferiorly to avoid distal necrosis and associated complications. Using this method, the defect was covered with look-alike tissue. The ease of dissection without the need to isolate a pedicle makes it an easy and safe option to use, even for surgeons who are not familiar with the concept of perforator flaps. It also decreases the operative time. Our patients stayed in the hospital for 3 days on average and were able to get back to work in 2 weeks. They received prophylactic antibiotic on the day of surgery, and for 1 week after the operation, dressing was changed daily by the patients at home until full healing of the wound was judged on the clinical visit. We had four incidents of wound dehiscence, which were all encountered in smokers and required no further surgical intervention, except for one case that needed re-suturing. Our recurrence rate at a mean follow-up time of 12 months was zero. Bulkiness at the base of the flap was the only concern faced in one patient, and it was managed by

Table 1. Variables Measured in the Study, Defect Size Was Measured in Centimeters

Age	Gender	BMI	Smoking	Defect Size after Excision (cm)	Flap Size	Postoperative Course	Aesthetic Outcome	Function
19	Man	27	No	Rt: 9×6 Lt: 10×5	Corresponding to the defect	Smooth	Good	Full
23	Man	26	No	Rt: 12×9 Lt: 12×8	Corresponding to the defect	Smooth	Good	Full
29	Man	28	Yes	Rt: 11×10 Lt: 11×9	Corresponding to the defect	Smooth	Good	Full
33	Man	26	Yes	Rt: 13×12 Lt: 12×12	Corresponding to the defect	Gapping at the right side upper margin	Good	Full
34	Man	27	Yes	Rt: 8×7 Lt: 10×8	Corresponding to the defect	Smooth	Good	Full
33	Man	23	Yes	Rt: 13×10 Lt: 11×8	Corresponding to the defect	Mild gapping bilateral	Good	Full
39	Man	29	No	Rt: 8×9 Lt: 8×7	Corresponding to the defect	Smooth	Good	Full
41	Man	23	No	Rt: 9×9 Lt: 10×9	Corresponding to the defect	Smooth	Good	Full
45	Man	21	Yes	Rt: 11×9 Lt: 12×13	Corresponding to the defect	Mild gapping	Good	Full
32	Man	28	No	Rt: 10×9 Lt: 11×8	Corresponding to the defect	Smooth	Good	Full
37	Man	27	No	Rt: 12×9 Lt: 11×7	Corresponding to the defect	Smooth	Good	Full
35	Man	29	Yes	Rt: 10×8 Lt: 9×7	Corresponding to the defect	Large gapping mandated secondary closure	Good	Full
37	Man	25	No	Rt: 11×11 Lt: 9×8	Corresponding to the defect	Smooth	Good	Full
36	Man	27	No	Rt: 10×7 Lt: 9×9	Corresponding to the defect	Smooth	Good	Full

liposuction in a second-stage surgery, which was done one-and-a-half years after the procedure.

In conclusion, this study aimed to introduce and encourage a treatment option for axillary hidradenitis of grade II and III based on the Hurley classification, which includes an extended axillary excision deep to the fascial level, ensuring complete excision of the affected area, with immediate reconstruction using the lateral chest flap as a reliable, easy, and fast way of reconstruction without an increased risk of infection or flap loss.

The limitation of this study is the low number of patients and the short period of follow-up to determine the actual recurrence rate. We recommend testing this theory on a larger number of patients for an extended period of follow-up time and using stronger study designs to compare this method with other ways of reconstruction.

Ghanem Aljasseem, MD

Plastic and Reconstructive Surgery Department
Hamad Medical Corporation
Doha, Qatar
E-mail: galjasseem@hamad.qa

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