



## Original Article

# Radical Surgical Excision and Use of Axillary Flap for Intractable Axillary Hidradenitis Suppurativa

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### Abstract

**Background:** Current treatments for hidradenitis suppurativa (HS) include prolonged courses of antibiotics, retinoids, immunosuppressants, and biologics. Severe cases that are resistant to prolonged medical treatment pose a therapeutic challenge. We propose radical excision and reconstruction with axillary flap as a treatment option for such cases.

**Objectives:** The purpose of the study was to see the outcome after radical surgical excision and coverage with axillary flap for intractable Hidradenitis suppurativa.

**Methods:** This prospective observational study was carried out from July, 2014 to June, 2016. Patients admitted at the Plastic Surgery Department of Dhaka Medical College Hospital with intractable Hidradenitis suppurativa were included in the study population.

**Result:** Among 20 cases, 12 cases were female and 8 cases were male. Maximum dimension of the soft tissue defect was  $15 \times 6.5 \text{ cm}^2 = (97.5 \text{ cm}^2)$ . Maximum dimension of the flap was  $17 \times 7 \text{ cm}^2 = (119 \text{ cm}^2)$ . Flap survived completely with minimum donor site morbidity. Result of reconstruction of 90% of the patients exhibited excellent outcome. In 10% patient's outcome was considered good.

**Conclusion:** With a suitable flap coverage option, the management paradigm of intractable Hidradenitis Suppurativa should shift from prolonged medical treatment to allow decisive radical excision, which will improve the quality of life for patients. Axillary flap is the flap of choice to cover the defect.

**Key words:** Axillary Hidradenitis suppurativa, Axillary flap, Radical excision

### Introduction:

Hidradenitis suppurativa (HS) of the axilla is a chronic debilitating disorder of the apocrine glands. In severe cases, follicular occlusion and secondary apocrinitis lead to the formation of abscesses and fistulating

sinus tracts, which are foul smelling, painful, and eventually cause scars.<sup>1</sup> Current treatments include prolonged courses of antibiotics, retinoids, immunosuppressants, and biologics. When there is no response to medical treatment and when activities of daily living are affected, these cases become intractable. We define HS as intractable when there is no response to medical therapy for at least 6 months. Surgical excision is the best method of treatment in chronic cases of axillary Hidradenitis suppurativa. Although a number of surgical options have been used, wide surgical excision is considered the best option with a minimal likelihood of recurrence.<sup>2</sup>

Cover of large skin defects in the axillary fossa is challenging due to the range of shoulder movement,

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which may be compromised by scar contracture resulting from inadequate surgery. A variety of surgical options are available after failure of conservative attempts to treat recurrent hidradenitis axillaris suppurativa and other axillary skin defects.<sup>3</sup> Simple direct closure after adequate radical excision is usually not feasible and the application of sheet or meshed skin grafts in many cases leads to unfavourable aesthetic results as well as functional impairment by scar contracture, which is reported in up to 70% of cases.<sup>4</sup>

### Vascular anatomy of Lateral thoracic (Axillary) flap

Vascular anatomy of lateral thoracic flap is variable. There are three axial vessels that supply the area of skin that is referred as lateral thoracic (axillary flap)

1. Lateral thoracic artery and its cutaneous branch is the terminal branch of the lateral thoracic artery that supply the pectoralis major and then runs along the lateral border of the pectoralis, terminating as the cutaneous branch. This vessel is much more prominent in females. Regional source: Axillary artery and vein. Length: 8 cm. Diameter: 1 to 2 mm.
2. Accessory lateral thoracic artery – is a direct branch from the axillary or brachial artery. It extends along the midaxillary line. Regional source: Axillary or Brachial artery. Length- 6cm. Diameter- 1.5 mm.
3. Cutaneous branch of thoracodorsal artery- It originates at the level of vascular hilum of latissimus and runs along the anteriolateral free border of the latissimus muscle. Regional source- scapular artery. Length – 6 cm.

### Materials and Methods:

This prospective observational study was conducted in the Department of Plastic Surgery, Dhaka Medical College Hospital, Dhaka (some private cases also included in this study) from July 2014 to June 2016. The study population included the patients with intractable Axillary Hidradenitis suppurativa. A total of 20 cases irrespective of age and sex on whom axillary flap for axillary defect was suitable with a healthy pedicle area were included in the study. Patients with scar on flap pedicle area or with scar

surrounding axilla or synachia were excluded from the study.

### Surgical technique:

**Patient positioning :** Under general anaesthesia, the patient is placed in the lateral decubitus or supine position. The entire upper extremity is included in the operative field to allow abduction of the upper arm during pedicle dissection. **Creation of wound:** Excision of all apocrine gland bearing area of axilla. After appropriate excision of wound, the size and location of the defect were noted.



**Fig.-1:** Case one with hidradenitis suppurativa (Rt. Axilla)

**Flap design:** Marking: The territory of the flap is outlined between the lateral edge of the pectoralis major and the anterior edge of the latissimus dorsi between the inferior margin of axilla and the level of the inframammary line (length upto 15-20 cm according to need). The flap dimension is determined by considering the size of the defect and the maximal tension of the donor site.



**Fig.-2:** Pre-operative marking. (Flap size 12x5 CM).



**Fig.-3.** Pre-operative marking

**Incision:** Under loupe magnification, the flap margins are incised. The incision was deepened along the margins of the flap, to incorporate the fascia overlying

serratus anterior muscle. Subfascial dissection then proceeded expeditiously over the muscle. Pedicle location: Lateral thoracic artery is located along the border of the pectoralis major muscle. The flap was elevated carefully and transferred to the defect for coverage of the wound. The flap was secured into position with the first two skin sutures placed. These two sutures should be carefully positioned to ensure that the pedicle was not put under tension. Thereafter the rest of the flap inset was done. Donor site was closed without any tension. Donor site could be closed primarily if the width of the defect was less than 7 cm or skin grafted if the donor defect was larger. Moist non compressive dressing was applied to the donor and recipient sites.



**Fig.-4:** After excision, creation of wound and incision given



**Fig.-5:** Raising of flap



**Fig.-6:** Flap dissection complete



**Fig.-7:** Transferred to cover the defect



**Fig.-8:** Donarsite closed primarily



**Fig.-9:** 7th POD



**Fig.-10:** After one month (Rt Axilla)



**Fig.-11:** After 3 months (Rt. Axilla), after one yr (Lt axilla)

**Results**

Most of the study populations were 20- 30 years old (about 43.33%). Among 20 cases, 12( 60%) cases

were female and 8(40%) cases were male. Bilateral involvement was found in 7 cases & unilateral involvement was found in 13 cases.

**Table 1.** Per-operative dimension of the soft tissue defect of the study population (n=20)

Dimension of soft tissue defect	Variables cm	Number of cases	Percentages (%)	Mean±SD (cm)	Meandimension (cm <sup>2</sup> )
Length of defect	4 – 6	01	05	9.77±2.64	54.41
	6.1 – 8	07	35		
	8.1 – 10	06	30		
	10.1 – 12	02	10		
	12.1 – 14	03	15		
Width of defect	14.1 – 16	01	05	5.57±0.61	
	3.5 - 4.5	01	05		
	4.6 - 5.5	10	50		
	5.6 – 6.5	09	45		

Maximum length of the soft tissue defect was 15 cm and minimum length 6 cm. The maximum width was 6.5 cm and minimum width 4.5 cm.

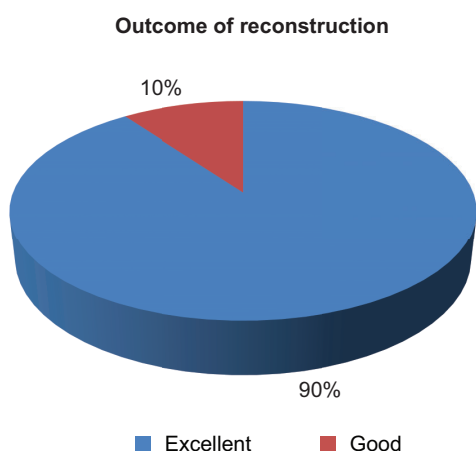
**Table-II. Dimension of the flap of the study population (n=20)**

Dimension of the flap	Variables cm	Frequency	Percentages (%)	Mean $\pm$ SD (cm)	Mean dimension (cm <sup>2</sup> )
Length of flap	6 – 8	03	15	10.77 $\pm$ 2.81	67.85
	8.1 – 10	10	50		
	10.1 – 12	02	10		
	12.1 – 14	01	05		
	14.1 – 16	03	15		
	16.1 – 18	01	05		
Width of flap	3.5 – 4.5	0		6.3 $\pm$ 0.57	
	4.6 – 5.5	03	15		
	5.6 – 6.5	12	60		
	6.6 - 7	05	25		

Maximum length of the flap was 17 cm and minimum length 7 cm. The maximum width of the flap was 7 cm and minimum width 5.5 cm.

**Table-III. Outcome of flap of the study population (n=20)**

Outcome	Frequency	Percentages
Marginal flap necrosis	02	10
Partial flap loss	00	00
Total flap loss	00	00
No loss (Complete survival)	18	90
Total	20	100

**Fig.-1. Distribution of patient by final outcome of reconstruction (n=20)**

### Discussion

The study was designed to see the outcome after coverage of the soft tissue defect in the axilla by axillary flap. The armamentarium of the reconstructive surgeon comprises direct closure, grafts, flaps, free tissue transfer and tissue expansion. Soft tissue defects of axilla may be covered by skin graft, local, regional and free flaps, depending on the conditions of the local wound, adjacent area, donor site and general condition of the patient. Each of them has its own sets of advantages and disadvantages. Skin grafting is the simplest reconstructive method, but it has several disadvantages like 1) the grafted area can cause contracture, 2) cosmetic result after skin grafting is poor. 3) the skin graft donor area is painful, 4) Long term splinting, often used to reduce graft contracture, can be cumbersome, need frequent checking and readjustment. The axilla may be resurfaced using a latissimusdorsi or a pectoralis major musculocutaneous flap, but the extra bulk of the muscle may limit abduction of the arm. The free flap is technically more difficult and it requires long anesthesia and more complicated post operative care. With the introduction of fasciocutaneous flaps by Ponten, there are now number of larger flaps available in the axillary region for coverage of axillary defects.<sup>5</sup> Roberts and Dickson and Bhattacharya et al. had reported the use of lateral thoracic fasciocutaneous flap in the

reconstruction of postburn axillary scar contracture. The advantages of the fasciocutaneous flap is the simplicity of its concept. The surgical dissection may be performed rapidly with great facility, since the subfascial plan is relatively bloodless. This flap may be chosen that is extremely pliable to permit easy recontouring of adjacent defects using tissues similar to the original in color, texture and consistency. No functional disturbance accrues, since muscle never has to be sacrificed. No special skills or equipment nor extended usurpation of operating theater time as demanded for microsurgical techniques is needed.<sup>5</sup>

The dimensions of the soft tissue were measured after excision of wound. Maximum length of the soft tissue defect was 15 cm and minimum length 6 cm. The maximum width was 6.5 cm and minimum width 4.5 cm. Maximum dimension of the soft tissue defect was  $15 \times 6.5 \text{ cm}^2 = (97.5 \text{ cm}^2)$  and minimum dimension was  $6 \times 4.5 \text{ cm}^2 = (27 \text{ cm}^2)$ . Mean dimension of the soft tissue defect was  $9.77 \times 5.57 \text{ cm}^2 = (54.41 \text{ cm}^2)$ . A study by Ziyad A, Jens K and Norbert P.<sup>6</sup> the size of defects resulted after excision ranged from  $16.5 \text{ cm}^2 (5.5 \times 3 \text{ cm})$  to  $735 \text{ cm}^2 (35 \times 21 \text{ cm})$ .

In this study Maximum length of the flap was 17 cm and minimum length 7 cm. The maximum width of the flap was 7 cm and minimum width 5.5 cm. Maximum dimension of the flap was  $17 \times 7 \text{ cm}^2 (= 119 \text{ cm}^2)$ , minimum dimension  $7 \times 5.5 \text{ cm}^2 (= 38.5 \text{ cm}^2)$ . Mean dimension of the flap was  $10.77 \times 6.3 \text{ cm}^2 (= 67.85 \text{ cm}^2)$ . In a case series, done by Semih et al (2015),<sup>8</sup> the size of the flap is quite large approaching  $15 \times 12 \text{ cm}$  in their series. A study by Wan L T, Yee-SO, Bien-KT<sup>7</sup> blood supply of the lateral thoracic flap (Axillary) is robust, with dimensions reaching  $30 \times 15 \text{ cm}$ . The delay technique was employed to boost the blood supply of the flap tip to ensure its survival. Primary closure of flap donor site was done in all cases. In a case series, done by Semih et al (2015),<sup>8</sup> the donor area of the flap has always been closed primarily, similar with this study.

In this study 18 (90%) flaps were completely survived without any morbidity. Marginal flap necrosis (less than 1 cm) was observed in 2 cases (10%) which were healed spontaneously without any surgical intervention. In a case series, done by Semih et al (2015),<sup>8</sup> Lateral thoracic (Axillary) perforator flap been used in locoregional ( Axilla, pectoral region, arm)

reconstruction as an island or propeller flap. In their series, they observed early venous congestion in two patients. In one of this patients, no flap loss has been observed and in the other patient superficial loss of skin in the periphery of the flap has been observed. No patients had developed morbidity on donor site.

### Conclusion

With a suitable flap coverage option, the management paradigm of intractable Hydradenitis suppurativa should shift from prolonged medical treatment to allow decisive radical excision, which will improve the quality of life for patients. Axillary flap is the flap of choice to cover the defect.

**Conflict of interest:** None

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### References

1. Shelley WB, Cahn MM. The pathogenesis of hidradenitis suppurativa in man; experimental and histologic observations. *AMA Arch Derm* 1955;72:562-5.
2. Parks RW, Parks TG. Pathogenesis, clinical features and management of Hidradenitis suppurativa. *Ann R Coll Surg Engl* 1997;79:83-9.
3. T asche C, Angelats J, Jayaram B. Surgical treatment of hidradenitis suppurativa of the axilla. *Plast Reconstr Surg* 1975; 55: 559–62.
4. Anton HS, Hildegunde P, Emilia H. The lateral thoracic fasciocutaneous island flap for treatment of recurrent hidradenitis axillay suppurativa and other axillary skin defects. *British Journal of plastic surgery*. 2000;53: 676–678.
5. Samy AM, Shehab ED, Osama MS. Reconstruction of Post-Burn Axillary Scar Constructures A Surgical Approach. *Egypt J. Plast. Surg* 1998;22(2):229-238.
6. Ziyad A, Jens K, Norbert P. A review of wide surgical excision of hidradenitis suppurativa. *BMC Dermatology*. 2012, 12:9
7. Wan L T, Yee-SO, Bien-KT. Radical Surgical Excision and Use of Lateral Thoracic Flap for Intractable Axillary Hidradenitis suppurativa. *Archives of plastic surgery*. 2012;39:663-666
8. Semih et al. Locoregional Use of Lateral Thoracic Artery Perforator Flap as a Propeller Flap. *Annals of plastic surgery*. 2015,74(5):532-5.