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Application of the thoracodorsal artery perforator flap in the reconstruction of axillary hidradenitis; our clinical experience

Aksillar hidradenitin rekonstrüksiyonunda torakodorsal arter perforatör flep kullanımı; klinik deneyimimiz

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ABSTRACT

Aim: Hidradenitis suppurativa (HS) is a chronic inflammatory skin condition primarily affecting apocrine gland-bearing areas such as the axilla. Advanced stages often necessitate wide local excision, with flap-based reconstruction emerging as a preferred technique for optimal functional and aesthetic outcomes. This study evaluates the clinical outcomes of thoracodorsal artery perforator (TDAP) flap reconstruction following wide excision for axillary HS

Materials and Methods: A retrospective review was conducted on patients who underwent surgical treatment for axillary HS between 2018 and 2023 at our institution. Inclusion criteria comprised patients with Hurley stage III HS unresponsive to medical therapy and unsuitable for primary closure. Demographic data, flap dimensions, defect size, postoperative complications, and functional outcomes were analyzed.

Results: Twelve male patients (mean age: 32.3 years) were included. Defect sizes ranged from 25 to 170 cm² (mean: 64.9 cm²), with an average follow-up period of 330 days. No complete flap loss occurred. One patient experienced marginal necrosis at the flap edge, managed conservatively. All patients reported high satisfaction, with preserved shoulder mobility and no significant recurrence.

Conclusion: The TDAP flap offers a reliable and functionally superior reconstructive option for axillary HS, particularly in moderate-to-large defects. Its favorable vascular anatomy, minimal donor site morbidity, and preservation of shoulder function make it an effective solution. Further comparative studies are warranted to establish long-term outcomes and validate these findings.

Keywords: Hidradenitis, flap, reconstruction

NOTE: *Portions of the data from this study were previously presented as a poster at the 46th National Congress of Plastic, Reconstructive and Aesthetic Surgery, held in Antalya, Türkiye, in 2024.*

ÖZ

Amaç: *Hidradenitis suppurativa (HS), esas olarak apokrin bezlerin bulunduğu bölgeleri etkileyen kronik inflamatuar bir deri hastalığıdır. İlerlemiş vakalarda geniş lokal eksizyon gerekebilir ve bu durumda optimal fonksiyonel ve estetik sonuçlar için flep rekonstrüksiyonu tercih edilmektedir. Bu çalışmada,*

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aksiller HS nedeniyle geniş eksizyon uygulanan hastalarda torakodorsal arter perforatör (TDAP) flebi ile yapılan rekonstrüksiyon sonuçları değerlendirilmiştir.

Gereç ve Yöntem: *2018–2023 yılları arasında kliniğimizde aksiller HS tanısıyla cerrahi tedavi uygulanan hastalar retrospektif olarak incelendi. Tıbbi ve lokal tedaviye yanıt vermeyen, primer kapatmaya uygun olmayan ve sadece aksilla bölgesi tutulumuna sahip hastalar çalışmaya dahil edildi. Demografik veriler, flep boyutları, defekt alanı, postoperatif komplikasyonlar ve fonksiyonel sonuçlar analiz edildi.*

Bulgular: *Çalışmaya, yaş ortalaması 32,3 olan toplam 12 erkek hasta dahil edildi. Defekt boyutları 25–170 cm² (ortalama: 64,9 cm²) arasında değişmekteydi. Ortalama takip süresi 330 gündü. Hiçbir hastada tam flep kaybı gözlenmedi. Bir hastada flebin proksimal kenarında marjinal nekroz gelişti ve primer kapama ile başarılı şekilde tedavi edildi. Tüm hastalar cerrahi sonuçlardan memnuniyet bildirdi ve omuz hareket açıklığı korundu.*

Sonuç: *TDAP flebi, özellikle orta ve büyük boyuttaki aksiller HS defektlerinde güvenilir ve fonksiyonel olarak üstün bir rekonstrüksiyon seçeneği sunmaktadır. Tutarlı vasküler anatomisi, minimal donör saha morbiditesi ve omuz fonksiyonunun korunması, bu flebi etkili bir yöntem haline getirmektedir. Bulguların doğrulanması için ileriye dönük karşılaştırmalı çalışmalara ihtiyaç vardır.*

Anahtar Sözcükler: *Hidradenit, flep, rekontrüksiyon*

NOT: *Bu çalışmanın bazı verileri, 2024 yılında Antalya'da düzenlenen 46. Ulusal Plastik Rekonstrüktif ve Estetik Cerrahi Kongresi'nde poster bildiri olarak sunulmuştur.*

INTRODUCTION

Hidradenitis suppurativa (HS) is a chronic, relapsing inflammatory skin condition primarily involving the apocrine glands. Commonly emerging during adolescence, HS can lead to significant physical and psychological challenges, particularly in its advanced stages. Although prevalence rates vary among studies, it is widely accepted that the condition affects approximately 1-4% of the general population[4].

Clinically, HS manifests as tender, swollen nodules, recurrent abscesses, and draining sinus tracts. Repeated episodes of inflammation contribute to fibrosis and scar contracture, which may restrict joint mobility. Additionally, symptoms such as persistent drainage and unpleasant odor can severely impair the quality of life, often resulting in social withdrawal. The presence of multiple comedones further exacerbates patient discomfort.

The disease most commonly affects intertriginous areas such as the axillae, groin, perianal, and gluteal regions, though the inframammary folds and presternal area may also be involved. While the exact histopathological mechanism remains unclear, follicular occlusion in conjunction with bacterial superinfection is believed to play a significant role in pathogenesis. A range of factors—including genetic predisposition, metabolic disorders, environmental exposures, smoking, and obesity—contribute to disease development.

While conservative management with medical therapy and local wound care may suffice in moderate disease, these approaches are often inadequate in extensive or refractory HS cases. In advanced diseases, surgical management becomes essential. Following the excision of affected tissues, options for reconstruction include healing by secondary intention, skin grafting, or flap-based reconstruction techniques[5].

This study aims to assess the outcomes of thoracodorsal artery perforator (TDAP) flap reconstruction in patients undergoing wide excision for axillary HS.

MATERIALS AND METHODS

This retrospective study includes patients diagnosed with HS who underwent surgical intervention in our clinic between 2018 and 2023. Only those unresponsive to prior medical and local treatments and unsuitable for primary closure were considered. Patients who underwent surgery for HS in anatomical regions other than the axilla were excluded. Data was obtained retrospectively from the department's electronic records.

Demographic and clinical variables, including age, sex, etiology, comorbidities, defect size, flap dimensions, follow-up duration, and postoperative complications, were analyzed. Preoperative planning for the TDAP flap involved CT angiography and handheld Doppler assessments.

RESULTS

A total of 12 male patients met the inclusion criteria, with a mean age of 32.3 years (range: 17–45 years). Defect sizes varied from 25 cm² to 170 cm², with a mean of 64.9 cm². The average follow-up period was 330 days (Table-1).

No cases of complete flap failure were observed. One patient developed marginal necrosis at the proximal edge of the flap, which was managed with excision and primary closure without further intervention. All patients expressed satisfaction with the surgical outcome. Functional results were favorable, preserving shoulder and arm range of motion (Figures-1, 2, 3).

Table-1. Demographic and clinical characteristics of patients

AGE	GENDER	ADDITIONAL DISEASE	DEFECT SIZE (cm^2)	COMPLICATION	FOLLOW-UP (day)
45	E	NO	30	NO	20
32	E	NO	35	NO	21
24	E	CEREBRAL PALSY	40	NO	630
24	E	NO	75	NO	500
17	E	NO	48	NO	990
41	E	NO	45	NO	35
27	E	NO	88	MARGINAL NECROSIS	560
38	E	NO	170	NO	200
42	E	DM, HT, KOAH, OSAS	110	NO	21
27	E	DM	48	NO	430
43	E	NO	65	NO	14
28	E	NO	25	NO	540

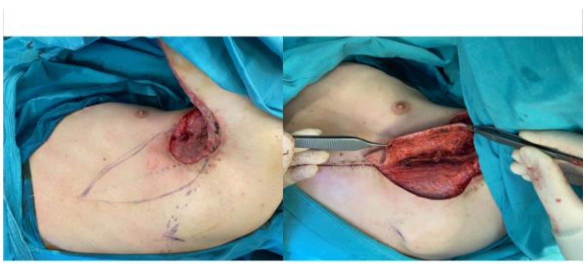

Figure-1. Intraoperative view of the defect and flap elevation.

Figure-2. Immediate intraoperative outcome and postoperative follow-up

Figure-3. Detailed view of the vascular pedicle

DISCUSSION

HS is a chronic disease of apocrine-bearing skin, marked by recurrent abscesses, sinus tracts, and scarring, most often in intertriginous regions of younger individuals and those with darker skin. Diagnosis is clinical, based on lesion patterns and distribution. Management is stage-dependent: early disease may respond to medical therapy and lifestyle changes, though long-term antibiotics and immunomodulators are limited by side effects and recurrence. In severe (Hurley III) cases, surgery is essential, ranging from drainage and deroofing to wide excision with clear margins to minimize recurrence, supported by multidisciplinary antibiotic management.

Reconstruction following wide excision should prioritize efficiency and patient outcomes. While healing by secondary intention is effective, it involves prolonged care and risks such as contracture, making it less desirable. Humphries et al. managed hidradenitis suppurativa (HS) cases involving various anatomical regions—including the axilla, groin, and gluteal area—through secondary healing following wide excision. Padula et al. also compared secondary healing with flap reconstruction in the management of axillary HS[6]. Although wound closure was achieved via secondary intention in both studies, the prolonged need for dressing changes, restricted range of motion, and the requirement for physical therapy remain significant disadvantages of this approach[7].

Skin grafting and flap-based reconstruction are common approaches. Split-thickness skin grafts allow faster recovery and lower recurrence than secondary healing but carry risks of failure and contracture. VAC therapy may decrease graft loss, as reported by Hynes et al. in axillary cases and Chen et al. in axilla, groin, and perineal lesions, though it also prolongs wound care, hospitalization, and costs[1][2].

Chronic HS often involves fibrotic changes requiring en-bloc excision, with histopathology essential to rule out malignant transformation. Soldin et al. emphasized that complete removal of the axillary hair-bearing area is critical for recurrence control [3]. Post-excision, reconstruction options include local, perforator, and free flaps. Random flaps are less suitable for large defects due to necrosis risk, whereas perforator flaps from the thoracodorsal, lateral thoracic, circumflex scapular, or brachial arteries provide reliable coverage. The posterior arm flap, based on the brachial artery, offers sensory preservation, good scar concealment, and bilateral applicability.

Several authors have recommended Posterior arm perforator flaps for the reconstruction of axillary hidradenitis suppurativa, including Schmidt et al., Thompson et al., Şirvan et al., and Datlı et al[8][9][10]. While these series reported successful reconstruction using the described techniques, complications such as wound dehiscence and the need for secondary procedures—such as flap debulking or dog-ear revision—were also noted. The parascapular flap, based on the circumflex scapular artery, is another option, although complications like wound dehiscence and dog-ear formation have been reported.

The parascapular flap, nourished by the circumflex scapular artery, is a reliable option for wide defects due to the removal of hidradenitis suppurativa. Its advantages are consistent vascular anatomy, a broad rotation arc, and good soft tissue volume with low donor site morbidity. Soldin et al. reported that this flap effectively covers significant defects; however, its bulky appearance and donor site scarring are drawbacks[3]. In contrast, Amendola et al., in their systematic review, identified it as the most favorable option due to the absence of recurrence and its low morbidity profile[11]. Furthermore, Meroni et al. described using this flap with intra-axillary tunneling, while Ibarra et al. introduced a modified design with inframammary extension, demonstrating alternative applications of the same flap[12][13].

TDAP flap has gained prominence as a primary reconstructive option following wide excision of axillary hidradenitis suppurativa, owing to its consistent anatomy, reliable vascular supply, and minimal donor site morbidity. It travels through the latissimus dorsi muscle, offering a dependable pedicle for safe dissection and reliable perfusion. In our practice, the TDAP flap is the preferred technique for moderate-to-large axillary defects, providing superior outcomes compared to skin grafts—particularly in joint regions—by reducing the risk of contracture and pigmentation changes. Multiple studies, including those by Ergani, Marchesi, Padula, and Elgohary, support its use, reporting low complication and recurrence rates[14][15][16]. The flap's proximity to the defect, ease of rotation with adequate intramuscular dissection, and preservation of shoulder mobility make it a practical and functionally advantageous choice. During flap harvest, particular care must be taken to preserve the thoracodorsal nerve to avoid neuromuscular complications.

CONCLUSION

In conclusion, flap-based approaches have become the preferred reconstructive strategy for axillary HS, offering enhanced functional and aesthetic outcomes. Our clinical experience supports the TDAP flap as a safe and effective solution with high patient satisfaction. Reconstruction must be individualized, considering defect size, patient expectations, and the surgeon's experience and technical capacity.

This study is limited by its retrospective nature and potential biases in data collection, patient selection, and follow-up. Future studies should incorporate comparative analyses of different treatment modalities using subjective and objective outcome measures.

Conflict of Interest

The authors confirm no conflict of interest.

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