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Case Report

Case series: The modified skoog approach for definitive management of severe hidradenitis suppurativa of the axilla

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ABSTRACT

Hidradenitis Suppurativa (HS) is a chronic, recurrent, suppurative, cutaneous disease, manifested by abscesses, fistulating sinus tracts and scarring (Brown, Rosen, & Orengo, 1998). After failed conservative management, surgical excision is the only definitive option (Edlich et al. 1986). There are several approaches to the excision and wound closure of axillary HS, mostly involving radical excision with associated risks of poor wound healing despite advanced wound closure techniques. We present a case series using the Modified Skoog approach for the management of axillary HS as a skin sparing technique that offers adequate wound healing, a short hospital stay and high patient satisfaction.

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Background and introduction

Hidradenitis Suppurativa (HS) is an inflammatory process of the apocrine glands, whose distribution it closely follows. Its pathology originates at the terminal epithelium of the hair follicle,¹ where inflammation leads to occlusion and obstruction of the apocrine glands draining into the follicle at the pilosebaceous interface.^{2,3} This cascades into dilation of ducts and sweat glands with rupture and

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spillage of contents including bacteria into the surrounding dermis and tissues. The clinical manifestations are abscesses and chronic inflammatory changes associated with HS.^{4,5}

HS of the axilla can be a distressing problem for a patient. Conventional treatment ranges from topical and systemic antibiotics to radical excision with healing by secondary intention or flap coverage. Recently, the use of hormonal, immunosuppressive drugs, antibodies,^{6–8} laser therapies⁹ and radiofrequency ablation¹⁰ has been described for mild to moderate disease. Surgical resection of involved tissue remains the mainstay for definitive management of severe disease.¹¹ Surgical resection traditionally leaves a skin deficit, creating a problem of coverage. We present an alternative skin sparing treatment method for severe HS which has been traditionally used to treat axillary hyperhidrosis.

Case series

Method

Nine (9) patients presented to our service from 2010 to 2013 with long-standing recurrent axillary abscesses. Three patients had bilateral disease, resulting in twelve treated axillae. Patients ranged from 24 to 48 years old with a median age of 29 years. The population was West Indian of Indo-Trinidadian, Afro-Trinidadian and Mixed ethnicities. All patients had recurrent disease despite previous conservative treatment with antibiotics plus or minus intermittent drainage procedures. All severe active infection was completely treated with antibiotics prior to the surgery. Any patients with HS that resolved with other forms of management were excluded. No patients met the exclusion criteria.

Clinical examination revealed obvious HS characterized by abscesses, scarring and sinuses of the apocrine distribution of the axillae. Surgery was offered to remove the apocrine bearing tissue while sparing the dermis and epidermis. The surgical technique was as follows:

1. General anaesthesia with standard preparation and infiltration of 1% lignocaine and epinephrine(1:100,000) to the affected axilla
2. The axilla was exposed with the arm in external rotation and abduction.
3. The apocrine distribution of the axilla is defined by marking an oval to include clinically involved tissue.
4. Methylene blue is injected into the sinuses for later identification in the resected tissue
5. Two parallel skin crease lines are drawn to divide this oval into a middle 50% and lateral 25% on either side. This represents the actual incisions. Any residual active disease is included as an ellipse within one of the incision lines (Figure 1). Care is taken to ensure that the skin flaps were made with a wide base (at least half length of incision to increase vascular supply)



Figure 1. Left axillary incision planning.

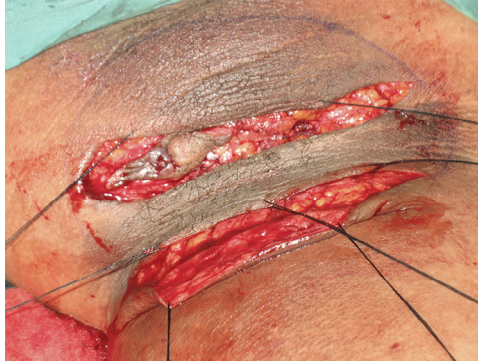


Figure 2. Initial dissection.

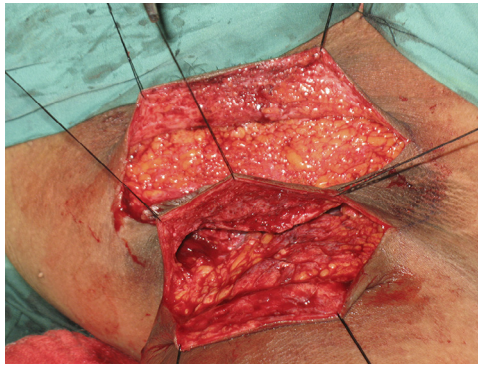


Figure 3. Excision of apocrine tissue.

6. The skin is sharply incised along the planned parallel lines just deep to dermis (**Figure 2**).
7. The flaps are then elevated between the dermis and hypodermis to expose the subcutaneous fat with the affected sweat glands appearing as islands embedded in this fat. Elevation of the flaps is continued to the margins of the oval markings (**Figure 3**). The skin flaps are inspected under loupe magnification and palpated for residual gland and scar nodules, which are difficult to distinguish. Scar nodule resections can lead to small perforations which is a minor complication.
8. This access is now used to resect the fat pad containing the diseased glands as a single specimen while preserving the integrity of the deep axillary contents (**Figures 4,5**).
9. Meticulous haemostasis is ensured and the skin flaps are replaced and sutured in 2 layers-: a sub-dermal approximating vicryl suture and interrupted 4.0 prolene for the skin (**Figure 6**).
10. A heavily padded dressing is applied for 1 week.
11. The patients are subsequently discharged after one day post operatively with antibiotics and analgesia.

Patients had a standard postoperative regimen in which they were reviewed in the outpatient department 7 days after surgery, booked for dressings as required at that point and routinely reviewed.

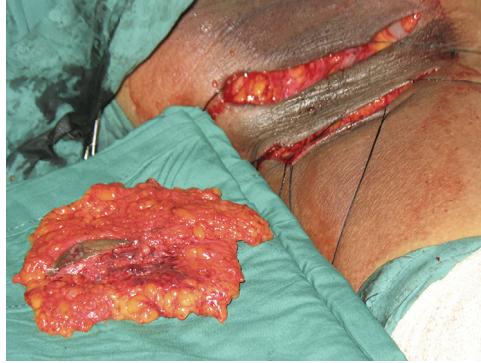


Figure 4. Excision of axillary fat pad.

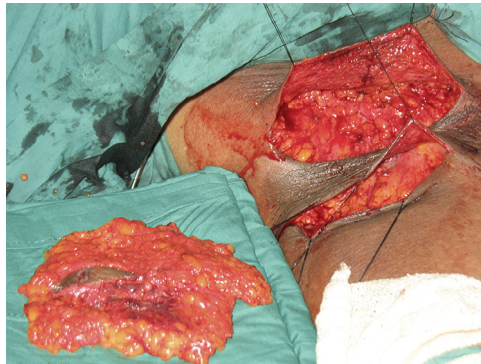


Figure 5. Apocrine and fat pad clearance.



Figure 6. Simple interrupted wound closure.



Figure 7. Six weeks post operative.

Results

At day 7, 7 of the 9 patients (9 out of 12 treated axillae) exhibited good wound healing with minimal local discomfort. One patient had mild wound dehiscence bilaterally, left to heal by secondary intention. A further patient exhibited delayed wound healing unilaterally with minor recurrence that was successfully managed by re-excision and vacuum assisted wound closure. All patients were dressing-free by 6 weeks (Figure 7). There were no recurrences at a 6-month and 3-year review.

All patients recorded excellent for scarring using a visual analogue scale. Four patients exhibited limited shoulder abduction initially but this resolved with home physiotherapy exercises by three months in all cases. There were no other postoperative complications.

Discussion

Surgery is considered the only curative therapy for severe HS,¹² with the extent of disease dictating the surgical options. There are significant concerns regarding definitive surgery for HS in any anatomical distribution. These include the frequency of a scarred, infected surgical field, an extended surface area of involved tissue which requires wide curative resection, and difficulties with reconstruction of the residual tissue defect. For the latter, options include vacuum assisted closure with skin grafts,¹³ local flaps and healing by secondary intention.¹⁴ Each of these presents its own unique problems, including variable graft take, donor site morbidity, bulky flaps, excessive scarring, limited range of shoulder motion, extended hospital stay, prolonged time off work and pain.¹⁵

The solution may be to address the pathophysiology and target resection accordingly. HS is a disease of the apocrine glands as a result of a hair follicle anomaly. The average axilla contains equal amounts of eccrine and apocrine glands. The latter are 9–10 times larger and extend through the dermis into the subcutaneous fat. These compound sweat glands consist of a coiled secretory component and a straight excretory component that drains into the hair follicle at the pilosebaceous interface. Thus the glands can be removed by the method described, by debriding the hypodermal layer that spares dermis yet still encompasses the chronically infected subcutaneous fat. The bipediced approach relatively preserves vascularity without compromising surgical access. However, we accept that skin flap survival may partially be in the form of a full thickness skin graft.

This approach was adapted from the Modified Skoog technique described by Wang et al in 1996 for the treatment of axillary bromhidrosis.¹⁶ Skoog originally outlined the four flap and lazy “S” approach in 1962 to remove all sweat glands while preserving skin. Other modifications of Skoog included a single skin crease approach for HS with admitted problems of access.

Further skin sparing options have been described, including minimal access ports for suction and curettage,¹⁷ scraping and liposuction, as well as the “4 axillary incision” technique and double W approach.¹⁸ Other methods of surgical treatment for bromhidrosis and by extension HS are removal of

dome skin and cellular tissue en bloc or combining this with removal of adjacent subcutaneous tissue. These last two techniques have the effect of resulting in a shortage of axillary skin, thus risking contractures and scarring. The bipediced approach described here minimizes this risk.

Flap complications can occur, but in our experience these can be managed conservatively with minimal scarring. In our opinion this justifies this technique as the simplest first option. Buttonholing is not infrequent, yet the traumatized axillary skin eventually heals better than a graft or bulky flap. Recurrences may present within the surgical margins or on the periphery owing to inadequate excision, a wide distribution of apocrine glands or multifactorial factors (hormonal, obesity, cigarette smoking, genetic) but is usually localized and can be managed accordingly. Overall, patients are satisfied with their surgery.

In the event of failed treatment by this technique, for instance as a result of flap failure or wound dehiscence, traditional treatment options are preserved: excision and closure by means of grafts, flaps or negative pressure wound therapy.

Conclusion

In its most severe form HS can be extremely debilitating. Fortunately cure is possible by excision of the affected tissue. Current approaches result in a shortage of skin cover. Closure mandates the use either of: technically-demanding flaps, which are bulky and produce significant donor scars; skin grafts, which are prone to contracture and also carry donor morbidity; and secondary intention healing, which is slow and also risks contracture formation.¹⁹

The well described skin-sparing approach to bromidrosis can be applied to severe HS with good results. We commend a bipediced skin-sparing technique, the Modified Skoog Approach, as a safe and effective first surgical option in treating severe axillary HS that does not preclude other subsequent treatment modalities.

Competing interests

The author(s) declare that they have no conflicting or competing interests.

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