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# Diagnosis and management of hidradenitis suppurativa

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Most health professionals who regularly examine adult patients will have seen hidradenitis suppurativa. The characteristic scarring of the axillae, inguinal areas, and breasts can be seen on routine physical examination, but the diagnosis may go unrecognised. The prevalence of this condition is around 1% in many European populations, and management is commonly shared between general practice, dermatology, and various surgical specialities.<sup>1 2</sup> Validated quality of life tools show worse scores for pain, effects on social functioning, living activities, and self image in hidradenitis than in psoriasis and eczema.<sup>3 4</sup>

This review aims to provide guidance for the management of hidradenitis in primary care, suggestions for when referral to secondary care is appropriate, and an overview of the available medical and surgical interventions.

## What is hidradenitis suppurativa?

Hidradenitis suppurativa is a skin disease that presents as recurrent painful nodules, which form in characteristic sites of the body and often progress to chronic purulent discharge, scarring, and sinus formation. The axillary and inguinal areas (fig 1) are mostly affected, whereas lesions in the breasts, lower abdomen, and perineal and perianal areas are less common but still characteristic (fig 2).

## What causes hidradenitis suppurativa?

The cause of hidradenitis is unclear. Histological analysis shows abnormal follicular occlusion in areas of the body with apocrine glands, and more advanced disease shows inflammation of the nearby apocrine glands and abscess formation.<sup>5</sup> Both a case-control study of adaptive and immune response and a study of innate immunity markers in hidradenitis patients have suggested that an abnormal immune response in the skin is a major factor.<sup>6 7</sup>

A family history is present in 30% of patients, and family studies suggest a genetic predisposition to this condition.<sup>8</sup>

A large cross sectional study indicated an association between prevalence and current smoking in both self reported and medically assessed cases. There is also clear evidence of an association between current smoking and sever-

## SOURCES AND SELECTION CRITERIA

We searched Embase, Medline, and CINAHL using keywords “hidradenitis”, “hidradenitis suppurative”, “suppurativa hidradenitis”, “hidradenitis suppurativa, familial”, and “acne inversa” for original research and reviews from 2005 to September 2012. We also manually searched studies cited in reviews. The NHS Evidence into Practice resource and the Cochrane Controlled Trials Register were also searched. We checked the bibliography of Jemec and colleagues’ 2006 book *Hidradenitis suppurativa* for additional sources,<sup>1</sup> in addition to the website of the British Association for Hidradenitis Suppurativa. The literature consists mostly of open studies and clinical reports on small groups of patients, with few randomised controlled studies of treatment. We excluded studies that did not differentiate results for hidradenitis treatment from other skin infections and case series reporting fewer than 10 patients with hidradenitis. Studies in languages other than English were excluded.

ity of disease.<sup>2 9</sup> The condition is associated with overweight, and severity in women increases with degree of obesity.<sup>2 9</sup>

The importance of hormonal factors is suggested by prevalence peaking during the reproductive years. Although evidence is lacking for a direct link with hyperandrogenism, many women with the condition experience premenstrual flares and partial or complete remission after the menopause.<sup>10</sup> Limited evidence supports our clinical experience that polycystic ovarian syndrome is more common in women with hidradenitis, and antiandrogen treatments can be effective in some women.<sup>11</sup>

## Who gets hidradenitis suppurativa?

Hidradenitis is more common in women than in men.<sup>1</sup> Average age of onset is around 21 years, although symptoms can start at any time between puberty and middle age.<sup>1</sup> Prevalence rates of 1-4% have been reported in European studies, with declining rates after age 55 years.<sup>1 12</sup>

## How does hidradenitis present?

Initial presentation is often with a painful nodule in the axilla or groin. This may develop into a persisting painless nodule that flares repeatedly over months or a discharging abscess with worsening pain.<sup>10 13</sup> The defining feature is the tendency for lesions to recur at the same sites or nearby, despite surgical incision and short courses of antibiotics. Some lesions show chronic purulent discharge. Over time more sites are affected, and in some cases there is progression to deep sinus tracts and cord-like scarring in affected areas, causing disfigurement and pain. Patients with extensive disease have usually had symptoms for years, and chronic sinuses occasionally result in the development of squamous cell carcinoma, as reported in several case series.<sup>14</sup>

## SUMMARY POINTS

Hidradenitis suppurativa is a chronic condition that presents as persistent or recurrent boils in the groin, axillae, and other apocrine bearing sites

Disease progresses to scarring and sinus formation in some cases

Mild cases are best managed by trying to reduce risk factors and tailored medical management

More severe cases require liaison between dermatologist, general practitioner, and surgeon for optimal treatment

Repeated simple incision and drainage rarely result in resolution of lesions and should not be the only treatment

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- ▶ Outpatient parenteral antimicrobial therapy (BMJ 2013;346:f1585)
- ▶ Diagnosis and management of carotid atherosclerosis (BMJ 2013;346:f1485)

**How is the diagnosis made?**

The diagnosis is made clinically on the basis of the typical sites affected and characteristic lesions (box 1). Most laboratory investigations are unhelpful.<sup>10</sup>

The differential diagnosis can include acne in lesions affecting the breast and trunk, but the presence of closed comedones (whiteheads) in acne distinguishes it from hidradenitis. Individual lesions may closely resemble simple boils or infected epidermoid cysts but, unlike these common skin infections, will not promptly respond to antibiotics. Women who have repeated “breast abscesses” may have underlying hidradenitis, so ask about a history of lesions in other typical sites. In isolated perineal and perianal disease consider Crohn’s disease, either alone or occurring in association with hidradenitis, as highlighted in a large case series.<sup>15</sup> In the assessment of pilonidal sinuses it is worth considering hidradenitis of the natal cleft.

Culture of bacteriology swabs from lesions is appropriate at first presentation, but our own experience is consistent with a case series in which 51% of cultures were sterile.<sup>16</sup> When potential pathogens such as *Staphylococcus aureus* and anaerobic bacteria are identified, treatment with an appropriate antibiotic will not prevent lesions recurring but may limit secondary inflammation and scarring.<sup>17</sup>

Repeated boils at body sites that are not typical for hidradenitis should be investigated with bacteriology swabs, looking particularly for Panton-Valentine leucocidin positive *S aureus*, which can cause recurrent boils that do not respond to treatment.<sup>18</sup>

Pyogenic skin infections occurring in sites atypical for hidradenitis may indicate defects of immune function. If this is suspected, initial screening tests should include blood glucose; full blood count, differential, and film; IgA, IgM, IgG, and IgE; total complement; HIV screening; serum protein electrophoresis; and urine for Bence-Jones proteins.<sup>19</sup>

**What treatments are available in primary care?**

Because of the well documented association with smoking and obesity, lifestyle advice is important at all stages of disease in both primary and secondary care.<sup>2</sup> Evidence of the effects of the disease on self image and social functioning



**Fig 1 | Hidradenitis suppurativa of the axilla; Hurley stage II disease**



**Fig 2 | Hidradenitis suppurativa of the lower abdomen; Hurley stage I disease**

**Box 1 | Features of hidradenitis: three key elements for diagnosis**

**Typical lesions**

- Painful or tender (or both) red papules or nodules
- Painful or tender (or both) abscesses
- Cord-like scarring
- Double open comedones (blackheads)

**Characteristic distribution**

Most commonly affected areas:

- Axillae
- Groin, inner thighs, pubic area
- Less commonly affected, suggestive but not diagnostic:
- Breasts, more often in women
- Perineum and perianal area, more often in men

**Recurrent pattern**

Active disease: One or more typical lesion in axillae or groin plus history of three or more painful or discharging lesions at these sites since age 10 years

Inactive disease: History of five or more painful or discharging lesions in axillae or groin since age 10 years, with no current active lesions

support assessment for depression as a vital part of the care of these patients.<sup>3</sup> During acute exacerbations adequate analgesia is important, because pain from the inflamed lesions is a major factor in the distress caused by hidradenitis.<sup>10</sup>

The choice of specific treatments is guided by disease severity. The Hurley staging system is often used in clinical practice to document severity and guide treatment (box 2).<sup>20</sup> In advanced disease, with extensive scarring, medical treatments alone may be of limited benefit, and surgical options should be considered in the treatment plan.

Mild disease (Hurley stage I, no scarring) can usually be managed in primary care. Treatment at the early stages of presentation can prevent progression to the scarring and sinus formation seen in advanced disease. However, limited evidence is available for the most widely used, well tolerated, and inexpensive treatment—oral tetracyclines, which are moderately effective in early disease. Two randomised controlled trials found that topical clindamycin 1% lotion used twice daily in affected areas for three

**Box 2 | Hurley's classification**

Stage I: Abscess formation, single or multiple without sinus tracts and scarring

Stage II: Recurrent abscesses with sinus tracts and scarring; single or multiple widely separated lesions

Stage III: Diffuse or almost diffuse involvement or multiple interconnected tracts and abscesses

months significantly reduced abscesses and pustules, with an improvement in nodule formation taking longer than three months.<sup>21 22</sup> Oral tetracycline (1 g daily) was compared with 1% clindamycin in one of the studies and found to be equally effective in reducing abscess formation after three months, with nodules again needing longer treatment.<sup>21</sup> Although no studies have compared different antibiotics in hidradenitis, in our experience three to six month courses of erythromycin 500 mg twice daily, lymecycline 408 mg daily, or doxycycline 100 mg daily have similar effects on abscess and nodule formation with better patient compliance than oral tetracycline. These drugs are thought to act through their anti-inflammatory effect, as in acne vulgaris, as well as by reducing secondary bacterial infection. Hidradenitis is a chronic disease, but we find that in mild disease such courses of antibiotics can often be prescribed intermittently, sometimes with the addition of topical clindamycin 1% as maintenance treatment. All tetracyclines are teratogenic so contraceptive advice should be provided where appropriate.

There is some evidence of altered tissue sensitivity to androgens in women with hidradenitis. One study found an association with polycystic ovarian syndrome, and a retrospective review of notes suggested that antiandrogen drugs worked better than oral antibiotics.<sup>11</sup> Current evidence does not enable a particular regimen of hormonal treatment to be recommended, but when required, it makes sense to choose hormonal contraception of low androgenicity (combined oral contraceptives containing one of

the less androgenic progestogens, such as norgestimate, desogestrel, or gestodene) or non-hormonal methods.<sup>23</sup> No research has looked at the effect of progestogen-only pills, progestogen implants, or depot progestogen, but we have found that they can be associated with an exacerbation in symptoms, as might be expected.

**When is referral to secondary care appropriate?**

Consider dermatology referral for patients with exacerbations that are frequent enough to cause them distress despite the above treatment and those with active disease plus scarring in at least one site (Hurley stage II disease).

Of the treatments offered in secondary care, the best quality evidence is for a combination of clindamycin 300 mg twice daily and rifampicin 300 mg twice daily for 10 weeks. Three retrospective uncontrolled studies, totalling 118 patients, showed significant improvement in 81% of patients at week 10 and a response across all grades of hidradenitis. Statistically significant improvements were seen in days per month with pain and suppuration and quality of life, although long term follow-up data were limited.<sup>24-26</sup>

Oral zinc treatment has been suggested because of its anti-inflammatory and antiandrogenic properties.<sup>7 27</sup> In a case series of 22 patients (mostly with Hurley stage I-II disease) treated with 90 mg zinc gluconate daily, partial or complete remission was seen in 12 patients during treatment.<sup>28</sup> However, this dose is well above that recommended by the Food and Drug Administration (40 mg) and would necessitate specialised monitoring.

Dapsone is also used in this condition because of its anti-inflammatory effects. A case series of 24 patients found improvement in nine, none of whom had "severe disease."<sup>29</sup> Although patients rapidly relapse after stopping treatment, dapsone might be an option for maintenance treatment in patients with moderate disease unsuitable for other treatments.

Oral isotretinoin has been tried in hidradenitis because of its efficacy in acne but failed to produce significant improvement in several studies.<sup>30 31</sup> Acitretin has shown more promise, with all 12 patients in a retrospective study showing remission.<sup>32</sup> This result confirms case reports of the drug's effectiveness, but because of its teratogenicity it is suitable only in male and non-fertile female patients.

A case series of 24 patients with hidradenitis found that metformin significantly improved disease severity and quality of life, and improvements were maintained at six month follow-up.<sup>33</sup> The authors suggest that this is due to the drug's antiandrogen effects. Another explanation might be its effects on various aspects of the metabolic syndrome. A recent case-control study showed a 40% prevalence of the metabolic syndrome in patients with hidradenitis, with a disproportionately high rate in patients under 34 years of age.<sup>34</sup> The authors suggested a mechanism for the metabolic syndrome's involvement in the development of hidradenitis. Larger studies are needed to confirm metformin's treatment effects but it may prove to be a useful agent for Hurley stage I and II disease.

Inhibitors of tumour necrosis factor  $\alpha$  have opened up a new treatment approach in patients with severe disease that is resistant to other treatments. Although response rates were promising with some of these agents, adverse

**TIPS FOR NON-SPECIALISTS**

Diagnose and treat early in the course of the disease to prevent or limit scarring

Advise patient at all stages of disease to stop smoking

Actively manage obesity; aim for a body mass index less than 25

In patients with no or minimal scarring, use maintenance oral tetracyclines or topical clindamycin for a minimum of 12 weeks

Refer patients with continuing disease activity and scarring to a dermatologist for more intensive medical treatment and advice about need for surgery

Simple excision and drainage of boils in hidradenitis has a high rate of recurrence and should be avoided

As in all chronic diseases, screen for and treat depression

**ADDITIONAL EDUCATIONAL RESOURCES**

Resources for healthcare professionals

Rambhatla P, Lim H, Hamzavi I. A systematic review of treatments for hidradenitis suppurativa. *Arch Dermatol* 2012;148:439-46

Kurzen H, Kurokawa I, Jemec G, Emtestam L, Sellheyer K, Giamarellos-Bourboulis EJ, et al. What causes hidradenitis suppurativa? *Exp Dermatol* 2008;17:455-6; discussion 457-72

**Resources for patients**

Hidradenitis Suppurativa Foundation ([www.hs-foundation.org](http://www.hs-foundation.org))—Accessible and up to date information about hidradenitis, with links to recent research and other resources

British Association for Hidradenitis Suppurativa ([www.ba-hs.org.uk](http://www.ba-hs.org.uk))—Information about hidradenitis for patients and medical professionals, online support for patients

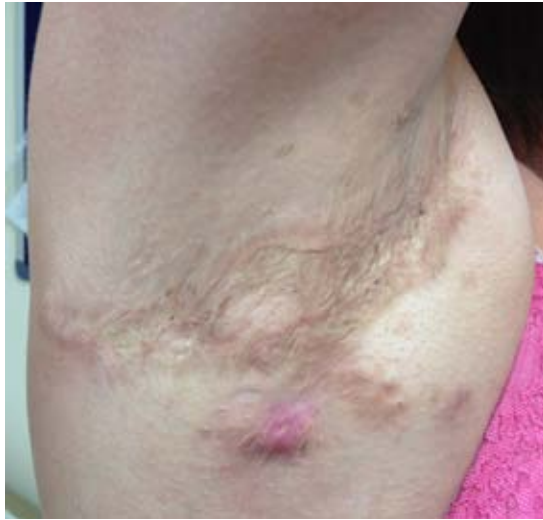


Fig 3 | Hidradenitis suppurativa of the axilla (Hurley stage II recurrent) after surgery

effects were common, as was relapse once treatment was stopped.<sup>35</sup> The place of these drugs in the management of recalcitrant hidradenitis is currently uncertain and further studies are needed.

**What are the surgical options for hidradenitis suppurativa?**

Optimal management of more severe and complex cases will probably require both dermatological and surgical expertise.

In Hurley stage I disease, where there is no scarring, simple incision and drainage of painful boils will not prevent recurrence, with one series showing a 54% rate of recurrence at the site.<sup>36</sup> Medical treatment is preferred for this grade of disease.

In Hurley stage II and III disease, where scarring has occurred, only surgery can remove these scarred areas. The disease should be in a quiescent phase when surgery is

attempted. Radical excision of the apocrine glands may produce temporary relief of symptoms, but the disease process may recur in residual glands in the surrounding area. The risk of recurrence after wide excision depends on the site affected, with axillary disease recurring less than inguinal disease.<sup>37</sup> Recurrence is more common in those with inadequate excision, obesity, continued smoking, and locally macerated skin (fig 3).<sup>37</sup>

Limited surgical options include deroofting of lesions and carbon dioxide laser ablation, both of which have some evidence of effectiveness.<sup>38 39</sup> A small randomised controlled trial showed improvement in individual lesions at three month follow-up after Nd:YAG (neodymium-doped yttrium aluminium garnet) laser treatment.<sup>40</sup> This trial used monthly outpatient treatments, with patients experiencing initial exacerbation of lesions followed by healing of some longstanding lesions. These techniques may be appropriate alongside medical treatment in patients who have continuing disease activity and sinus formation but are unsuited for major surgery.

In patients with extensive sinuses, surgery may be extremely complex, with large areas of skin needing to be removed and major difficulty in skin closure. Primary closure is the procedure of choice, but secondary intention, skin grafting, or rotation flaps may be needed in extensive disease.<sup>41</sup> Warn patients that infective complications and delayed healing are common.

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Patient consent obtained.

References are in the version on bmj.com.

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**STATISTICAL QUESTION**

**Receiver operating characteristics curves**

Statements *a* and *b* are true, whereas *c* is false.

**ANATOMY QUIZ**

**Radiograph of the ossification centres of a child's wrist**

- A: Hamate bone
- B: Triquetral bone
- C: Trapezoid bone
- D: Scaphoid bone
- E: Epiphysis of distal radius

**CASE REPORT A mass in the liver**

- 1 The main differential diagnosis of a large mass in the liver is a pyogenic or an amoebic liver abscess. A hepatic cyst complicated by haemorrhage or secondary infection could also present in a similar clinical way.
- 2 Aside from abdominal imaging, amoebic serology should be performed. Urgent therapeutic aspiration of the abscess should be undertaken owing to its location in the left lobe of the liver and risk of rupture into the pericardium.
- 3 In addition to urgent therapeutic aspiration, broad spectrum antibiotics covering organisms that cause pyogenic liver abscesses should be started in accordance with local antibiotic policy. High dose oral metronidazole (800 mg three times daily) should also be given. If the diagnosis of amoebic liver abscess is confirmed by amoebic serology, metronidazole should be continued alone for 10 days, followed by a 10 day course of an intestinal amoebicide, such as paromomycin or diloxanide furoate.
- 4 Feared complications of amoebic liver abscess include pericardial rupture and cerebral amoebiasis, which have high mortality rates.