

MRI Features of Hidradenitis Suppurativa and Review of the Literature

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We describe a case of hidradenitis suppurativa in a 31-year-old woman with Crohn's disease diagnosed by MRI and confirmed histologically. This disorder is rare and is characterized by recurrent abscesses, sinus tract formation, and scarring. It shares characteristics with acne conglobata, dissecting cellulitis of the scalp, and pilonidal sinus.

The imaging findings include marked thickening of the skin, induration of the subcutaneous tissues, and formation of multiple subcutaneous abscesses. The differential diagnosis for these findings includes carbuncles, lymphadenitis, and infected Bartholin's or sebaceous cysts.

Two previous cases are described in the radiology literature, with only one report describing the MRI findings. However, these two reports describe the imaging features of the complications of this disease rather than the imaging features of the disease. We describe the MRI features within the skin and subcutaneous tissues of the typical form of hidradenitis suppurativa that, to our knowledge, has not been described previously. We also review the literature. Hidradenitis suppurativa is usually diagnosed clinically. This disease may be chronic and progressive; there is no single effective treatment, and surgical débridement may be required. Our patient eventually required radical surgery for treatment.

Case Report

A 31-year-old woman with a history of Crohn's disease presented on several occasions to the emergency department at our hospital. She had Crohn's disease that was diagnosed 20 years earlier. She had been treated previously with right hemicolectomy and right iliac fossa end stoma. She had vaginal burning and more recently had multiple pus-filled lesions discharging into her groin. These lesions had been confined to her groin, but over the

previous few weeks the lesions had spread to involve the thighs, trunk, back, and face.

On examination, the patient had multiple extensive pustular lesions in various stages of evolution throughout her groin and including her labia minora. Some of these were ulcerated and raw, with others draining frank pus. Lesions measured up to 15 mm in diameter. The labia minora were swollen, erythematous, and extremely tender. Examination with the patient under anesthesia revealed multiple sinus tracts and abscesses with induration involving the entire vulva and purulent drainage from more than 20 sites on the vulva, medial thighs, and mons pubis. She was referred for MRI because of her history of Crohn's disease to evaluate for perineal abscess formation.

MRI was performed on a 1.5-T scanner (Signa, GE Healthcare) using our fistula protocol. This protocol includes the following sequences: a three-plane localizer, coronal single-shot fast spin-echo, axial T1-weighted spin-echo, axial T2-weighted fast spin-echo with fat saturation, axial STIR, sagittal STIR, axial 2D spoiled gradient-recalled echo before and after contrast administration, and coronal 2D spoiled gradient-recalled echo after contrast administration.

MRI of the pelvis revealed marked thickening of the skin and induration of the subcutaneous tissues over the medial aspects of the thighs, perineum, and mons pubis, which were of low signal on T1-weighted images and high signal on T2-weighted and STIR images (Figs. 1A and 1B). In addition, multiple small areas of low signal on T1-weighted and of high signal on T2-weighted (Fig. 1C) and STIR images were shown in the subcutaneous tissues. After IV contrast administration, many of these small subcutaneous areas showed rim enhancement compatible with multiple abscesses (Figs. 1D–1G). Enlarged lymph nodes were present in both inguinal regions (Figs. 1H and 1I). No communication

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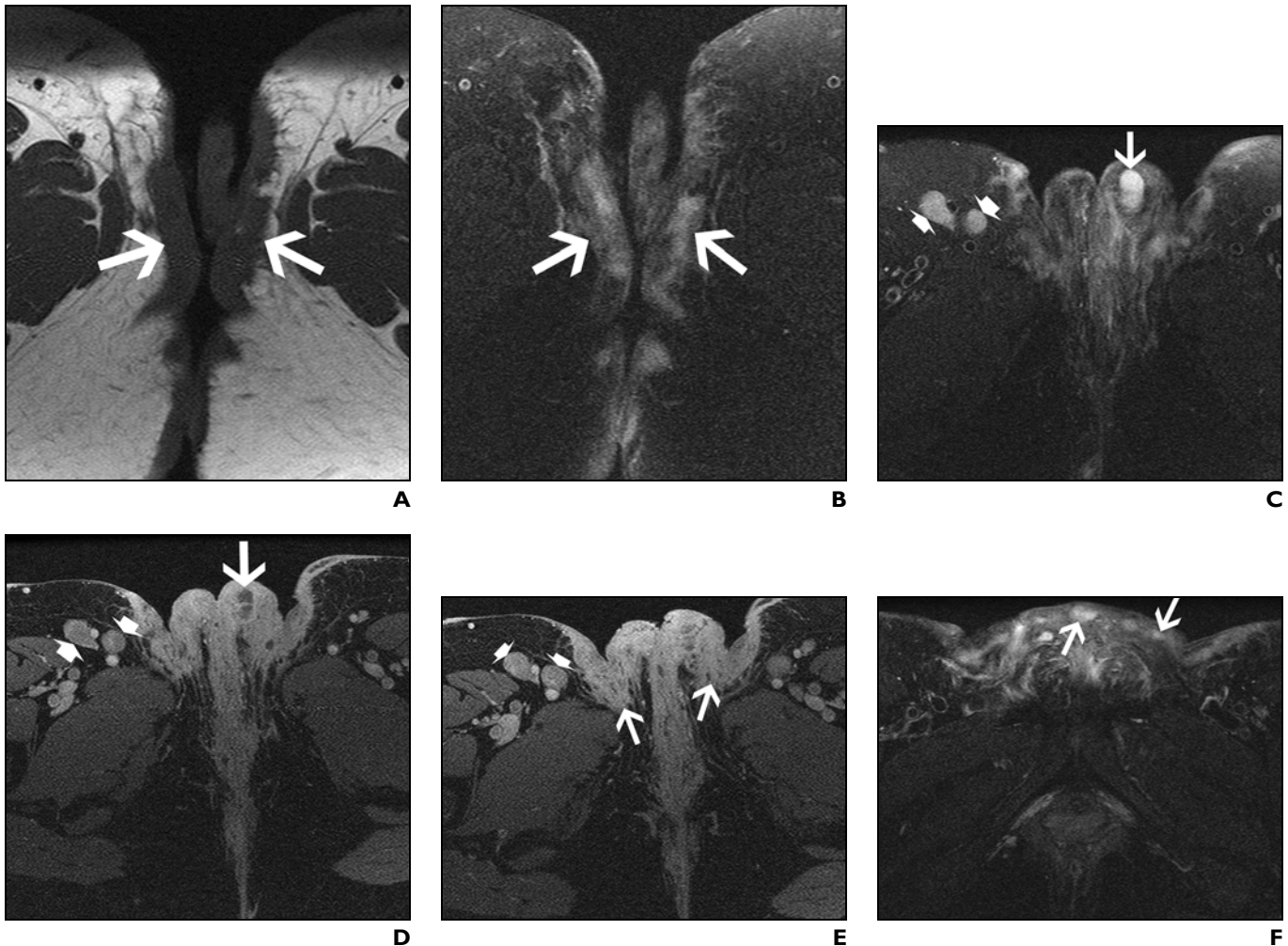


Fig. 1—31-year-old woman with hidradenitis suppurativa.
A, Axial T1-weighted spin-echo MR image (TR/TE, 467/9) obtained through upper thigh without fat saturation shows marked cutaneous thickening of medial thighs that is of low signal intensity (*arrows*).
B, Axial T2-weighted fast spin-echo MR image (3,800/84) obtained through upper thigh with fat saturation shows edema of subcutaneous tissues with skin thickening of high signal intensity (*arrows*).
C, Axial T2-weighted fast spin-echo MR image (3,800/84) of labia majora obtained through perineum with fat saturation shows ovoid area of high signal intensity (*long arrow*) that is consistent with abscess and reveals skin induration and thickening. Also, note enlarged lymph nodes (*short arrows*).
D, Axial T1-weighted spoiled gradient-recalled echo MR image (250/3.1) obtained through perineum with fat saturation after IV contrast administration at same level as **C** also shows ovoid area of high signal intensity (*long arrow*) after IV contrast administration consistent with abscess. Also, note enlarged lymph nodes (*short arrows*).
E, Axial T1-weighted spoiled gradient-recalled echo MR image (250/3.1) of labia majora obtained through perineum with fat saturation after IV contrast administration shows marked enhancement of indurated and thickened skin and of subcutaneous tissues (*long arrows*). Also, note enhancing enlarged lymph nodes (*short arrows*).
F, Axial T2-weighted fast spin-echo MR image (3,800/84) obtained through mons pubis with fat saturation shows several high-signal-intensity foci (*arrows*) consistent with abscesses in cutaneous and subcutaneous tissues anterior to symphysis pubis.
(Fig. 1 continues on next page)

with the bladder, urethra, or rectum was detected (Fig. 1J), and the abscesses were distinctly remote from the rectum and anus. These findings are not compatible with the fistulous tracts associated with Crohn's disease, and given the clinical history and radiologic appearance, a diagnosis of hidradenitis suppurativa was considered.

Before MRI, the patient underwent vulvar biopsy. Several days later the histology results became available. The results revealed

scar with intense chronic inflammation with ruptured squamous-lined tracts in the dermis, consistent with hidradenitis suppurativa.

Unfortunately, our patient has required extensive surgical treatment with abscess incision, drainage, and evacuation. She later underwent radical resection of the lower abdomen, bilateral thighs, and bilateral buttocks. This procedure was then followed with radical vulvectomy, further thigh resection and groin resection, and mons pubis resection.

Discussion

Hidradenitis suppurativa, first described in 1839 by Velpeau, is a chronic disease manifest by recurrent abscesses, sinus tracts, and scarring [1]. This disease typically affects the genitofemoral area in women or axillae in both sexes. It is also known as Verneuil's disease or acne inversa. It is a member of the follicular occlusion tetrad along with acne conglobata, dissecting cellulitis of the scalp, and pilonidal sinus [1].

MRI Features of Hidradenitis Suppurativa

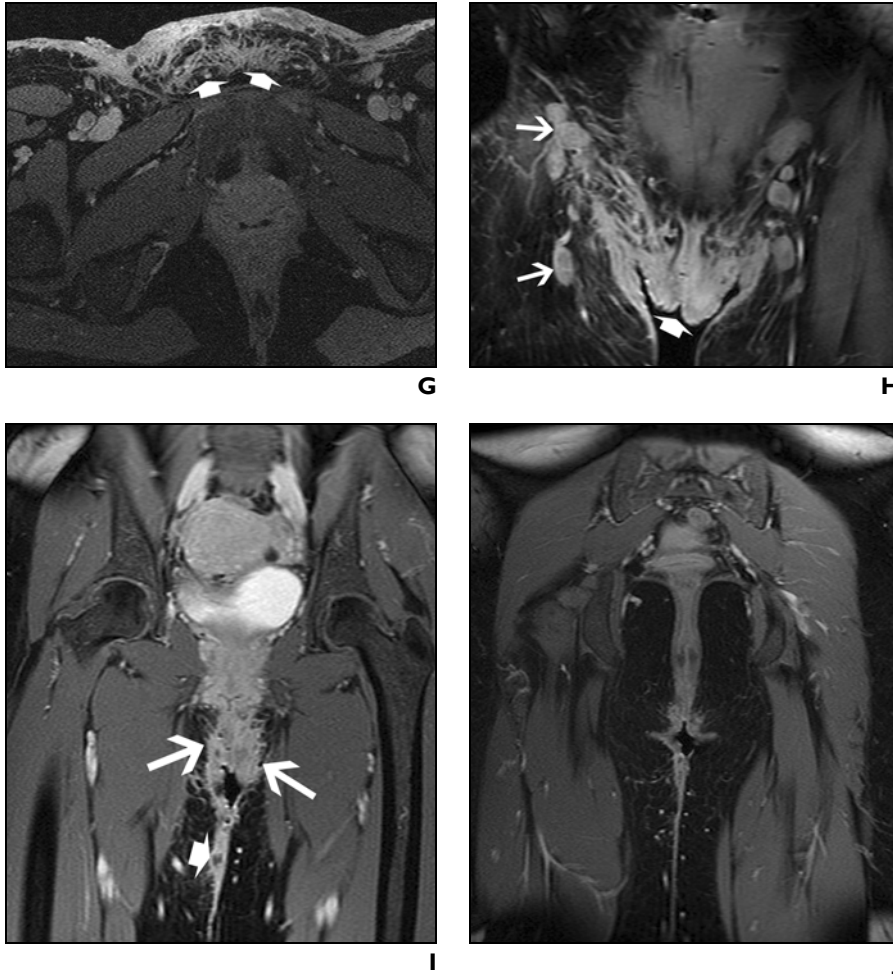


Fig. 1 (continued)—31-year-old woman with hidradenitis suppurativa.
G, Axial T1-weighted spoiled gradient-recalled echo MR image (250/3.1) obtained through mons pubis with fat saturation after IV contrast administration shows marked enhancement of indurated and thickened skin and inflammatory stranding of subcutaneous tissues (*arrows*).
H, Coronal T1-weighted spoiled gradient-recalled echo MR image (240/2.4) obtained through mons pubis with fat saturation after IV contrast administration shows enlarged lymph nodes (*thin arrows*). Also, note marked enhancement of indurated and thickened skin and inflammatory stranding of subcutaneous tissues (*thick arrow*).
I, Coronal T1-weighted spoiled gradient-recalled echo MR image (240/2.4) obtained with fat saturation after IV contrast administration shows small rim-enhancing area (*thick arrow*) within medial thigh that is compatible with abscess. Also, note skin induration and thickening with inflammatory stranding of subcutaneous tissues (*thin arrows*).
J, Coronal T1-weighted spoiled gradient-recalled echo MR image (240/2.4) obtained with fat saturation after IV contrast administration shows normal appearance of rectum.

Little is known about its cause to date [2], but it is thought that the initial event is follicular hyperkeratosis with occlusion of the follicle. Dilatation of the follicle is followed by rupture and spillage of contents into the surrounding dermis. This induces a chemotactic response with a resultant inflammatory cell infiltrate. The apocrine glands are secondarily involved, and secondary infection may also occur.

Hidradenitis suppurativa has a prevalence of approximately 1 in 300 [3] and is more common in women, with a ratio of three females to each male affected. Onset is most

common from childhood to middle age with a peak during puberty. Onset is rarely described in patients before puberty or after menopause.

In approximately a quarter of the cases, there is a family history with an autosomal-dominant mode of inheritance [4]. Several disease entities have been reported as being associated with hidradenitis suppurativa including Crohn's disease, Dowling Degos disease (acquired reticulate pigmented macules in the flexures), and arthropathy [5]. A hormonal influence is cited [4], and antiandrogen therapy has been used with benefit [4]. Bacte-

rial infection is implicated in the pathogenesis of the disease [4]. Obesity may aggravate the disease. Smoking is reported more frequently among patients with hidradenitis suppurativa [4]. The diagnosis is clinical, and no specific diagnostic test exists. Hidradenitis suppurativa has a variable clinical course [6].

Sinus tracts may develop, and fistula formation has been described. Perianal hidradenitis suppurativa mimics the presentation of Crohn's disease, anal fistula, pilonidal sinus, or perianal abscess [7, 8]. Crohn's disease and hidradenitis suppurativa may coexist, as in our patient, making diagnosis difficult. Because our patient did not have sinus tract formation extending to the bowel, distinguishing the cutaneous and subcutaneous manifestations of Crohn's disease from those of hidradenitis suppurativa was easier. Nadgir et al. [8] described perirectal sinus tract and fistula formation caused by hidradenitis suppurativa on double-contrast barium enema examination simulating inflammatory bowel disease in a patient without inflammatory bowel disease.

In our patient, MRI revealed marked thickening of the skin, induration of the subcutaneous tissues, and formation of multiple subcutaneous abscesses. The thickened skin and indurated subcutaneous tissues were of low signal on T1-weighted images and high signal on T2-weighted and STIR images, probably reflecting tissue edema. The areas of abscess formation were of low signal on T1-weighted images and high signal on T2-weighted and STIR images and showed peripheral rim enhancement after IV contrast administration. The disease was confined to the skin and subcutaneous tissues of the perineum and medial thighs. No communication with the pelvic organs, such as the bladder, urethra, rectum, or anus, was present. In addition, the lymph nodes in both inguinal regions were enlarged.

The differential diagnosis for these appearances includes carbuncles, lymphadenitis, and infected Bartholin's or sebaceous cysts. Complications may be local or systemic. Infection may develop, leading to septicemia, and MRI features of a lumbosacral epidural abscess have been described [9]. Anemia or leukocytosis may occur. Scarring and fibrosis lead to contractures and decreased mobility. With chronic disease, strictures may develop in the anus, urethra, or rectum. In addition, disfiguring genital edema may develop. Arthropathy associated with hidradenitis suppurativa has variable clinical features, and its activity is associated with hidradenitis suppurativa disease activity [5]. Squamous cell carcinoma may

rarely develop in chronically inflamed areas and scars in long-standing cases [4].

There is no single effective treatment, and therapies include systemic antibiotics, topical antiseptics, and compresses. Intralesional corticosteroids have been used, as have systemic retinoids. Antimetabolites and antitumor necrosis factor antibody have shown efficacy in one patient with Crohn's disease and hidradenitis suppurativa. Antiandrogens and 5 α -reductase inhibitors also may provide some benefit. Surgical removal of all involved tissue is the definitive treatment [4], as in our patient. Postoperative recurrence is common after incision and drainage and limited surgical excision. Laser treatment with carbon dioxide is an alternative in mild to moderate cases. Several authors have reported the benefit of radiation therapy [4].

In conclusion, hidradenitis suppurativa is a rare disease that typically affects the genitofemoral area, axillae, or both. MRI findings are relatively nonspecific with skin thickening and induration of the subcutaneous tissues that are of low signal on T1-

weighted images and high signal on T2-weighted and STIR images. There also may be subcutaneous abscess formation; abscesses are of low signal on T1-weighted images and high signal on T2-weighted and STIR images and show peripheral rim enhancement after IV contrast administration. Although these are the typical features of hidradenitis suppurativa, these are not distinguishable from those of erysipelas (inflammation of the epidermis, usually due to a bacterial infection) or cellulitis (inflammation of the dermis). If sinus tract formation and fistula formation are noted and scarring is present, then the diagnosis of hidradenitis suppurativa should be considered. Hidradenitis suppurativa is still a possible diagnosis in patients with Crohn's disease because these entities can coexist, as in our patient.

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