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Surgical management of hidradenitis suppurativa: procedural trends and risk factors

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ABSTRACT

Background: Hidradenitis suppurativa (HS) is a chronic debilitating cutaneous disorder. The recalcitrant nature of this disease may require surgery in severe cases. We aimed to delineate the types of operations performed, the risk factors associated with these operations, and the surgical services involved based on a national database.

Methods: Data were collected through the American College of Surgeons National Surgical Quality Improvement Program from 2011 to 2016. Current Procedural Terminology (CPT) and International Classification of Disease, Ninth Revision, (ICD-9) codes were used for data extraction and analysis as type of surgery and complication rates were extracted.

Results: There were 2594 patients diagnosed with HS: 1405 (54.2%) incision and drainage, 1017 (39.2%) debridement, 31 (1.2%) skin graft, and 141 (5.4%) flap reconstruction. There were significant differences in transfusion rates and operation time among the four procedures. Skin graft and flap reconstruction had the highest complications and longest operation time. Bleeding requiring preoperative transfusion and a number of comorbidities were significant risk factors for postoperative complications. Flap reconstructions by plastic surgeons compared to general surgeons had significantly shorter operation times (134.89 *versus* 209.82 min, $P = 0.022$) and lower transfusion rates (2.2% *versus* 12.8%, $P = 0.024$).

Conclusions: The management of HS can be complex and may require a multidisciplinary approach. Bleeding requiring preoperative transfusion and other baseline comorbidities are independent risk factors that should be addressed when definitive surgical treatment of hidradenitis is planned. Appropriate surgical specialty involvement may better optimize the surgical outcomes for HS.

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Introduction

Hidradenitis suppurativa (HS) is a chronic debilitating cutaneous disorder associated with severe pathology of the terminal follicular epithelium in the skin harboring apocrine glands.[1] It is a disorder that plagues otherwise healthy young adults, and its relapsing remitting nature confers significant distress to patients. The presentation of the disease involves a classic distribution of painful lesions in the skin creases with associated local complications of abscesses and sinuses. There are often associated systemic inflammatory symptoms, and management is handled by a variety of specialties including primary care, dermatology, general surgery, and plastic surgery.[2,3] The absence of a designated specialty taking ownership of these patients often results in delays in diagnosis and treatment.

In the context of surgical management, a myriad of options are available in the most severe cases with none providing definitive relief. Simple incision and drainage[4] of abscesses and deroofing of sinus tracts are frequently performed in the acute setting by the on-call surgical service.[5,6] Skin grafting[7,8] and closure with cutaneous or myocutaneous flaps[9,10] are often performed by plastic surgeons.[11-13] Treatment outcomes are often unsatisfactory because of the deep-seated nature of the pathology, and many patients are lost to follow-up.[14]

This study examines the incidence of HS on a national level as well as the type of surgical intervention, the surgical services involved in operative care, and the associated perioperative complications and respective risk factors. The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) was used to examine current trends and outcomes in the surgical intervention of HS.

Methods

A retrospective analysis of the data was used to extract diagnosis and operative procedures related to HS from 2011 to 2016. The ACS-NSQIP database is well validated and tracks patients having general, spinal, or epidural anesthesia for surgical procedures in over 400 medical centers in North America. Perioperative data and postoperative complications within 30 d of the procedure performed are collected as part of a cross-sectional study. No Institutional Review Board approval was needed for this study utilizing the ACS-NSQIP database.

Data extraction was undertaken in ACS-NSQIP. Patients with postprocedural diagnosis recorded as HS were first identified using the International Classification of Diseases, Ninth Revision, (ICD-9) codes (705.83) to ascertain disease prevalence over the study period. Subsequently, Current Procedural Terminology (CPT) codes (incision and drainage [I&D]: 11450, 11451, 11462, 11463, 11470, 11471, 10060, and 10061; debridement: 11000, 11004, 11005, 11006, 11010, 11011, 11012, 11042, 11043, 11044, 11045, and 11046; skin graft: 15220, 15240, 15050, 15100, 15120, 15760, 15770, 15110,15115, 15130, 15135, 15300, 15320, 15170, 15175, 15330, 15335, 15400, 15420, 15430, 15200, 15260, 15271, 15273, 15275, and 15277; and flap reconstruction: 14000, 14001, 14020, 14021, 14040, 14041, 14060, 14061, 14301, 14350, 15732, 15734, 15736, 15738, 15740, 15750, 15756, 15757, 15758, 49904, 49905, and 49906) were used to capture patients having undergone specific HS-related surgical interventions. These patients were then grouped based on procedure, including I&D, debridement, skin grafting, and flap surgery. In the event of overlapping procedures, patients were then grouped based on the most complex procedure performed, escalating from I&D to debridement to skin grafting to flap reconstruction. Patients acquired from the skin grafting and flap reconstruction categories were divided into two groups (plastic surgery and general surgery) based on the primary team administering care.

Preprocedural characteristics collected included variables such as age, body mass index (BMI), ethnicity, gender, smoking status, comorbidities of diabetes, hypertension, steroid-dependence, dialysis-dependence, congestive heart failure, and wound status. However, we were unable to assess disease severity metrics such as size or depth because of being restricted to the ACS-NSQIP database variables. Similarly, postprocedure outcomes were extracted, including 30-day surgical site infection (SSI), wound dehiscence, bleeding necessitating transfusion, reoperation, and readmission.

Statistical analysis

We examined differences between surgical procedures for patient characteristics and postoperative outcomes, as well as between plastic surgery and general surgery services, and skin graft and flap reconstruction for postoperative outcomes and complications. The independent t-test or Wilcoxon-Mann-Whitney test was used for continuous variables, and the Chi square or Fisher's exact test was used for categorical variables. Multiple logistic regressions were performed to assess independent risk factors for outcomes of SSI, wound dehiscence, bleeding necessitating transfusion, reoperation, and readmission for the four different surgical interventions. P value <0.05 was defined as statistically significant. All calculations were conducted using IBM SPSS, version 20.0 (IBM Corp., Armonk, NY).

Results

Overall

A total of 2594 patients were identified in ACS-NSQIP having an ICD-9 or CPT code for HS over the course of the study period from 2011 to 2016, with 1405 (54.2%) I&D, 1017 (39.2%) debridement, 31 (1.2%) skin graft, and 141 (5.4%) flap reconstruction cases. There were significant differences between the four procedures in regard to the mean age, BMI, ethnicity, gender, inpatient/outpatient setting, obesity, diabetes mellitus, hypertension, bleeding disorders, weight loss, acute renal failure, wound status, American Society of Anesthesiologists (ASA) class, and surgical specialty (Table 1). There were also significant differences in postoperative outcomes of wound dehiscence and operation time (Table 2).

Plastic surgery versus general surgery

When comparing outcomes for plastic surgery *versus* general surgery in skin graft procedures for hidradenitis, there