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ORIGINAL RESEARCH

Analysis of the Efficacy and Safety of Secukinumab Combined with Surgical Treatment for Hidradenitis Suppurativa: A Real-World Retrospective Study in China

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Purpose: Hidradenitis suppurativa (HS) is a chronic inflammatory skin disorder. The IL-17A antagonist secukinumab has shown promising efficacy in international clinical trials; however, real-world evidence from China remains limited. This study evaluates the effectiveness and safety of secukinumab combined with surgical intervention for treating severe HS in a Chinese cohort.

Patients and Methods: A retrospective analysis of 21patients with HS admitted to our hospital from May 2023 to August 2024 was conducted. The patients received combination therapy consisting of secukinumab and palliative surgery. The primary efficacy endpoint was the proportion of patients achieving Hidradenitis Suppurativa Clinical Response (HiSCR50) at week 16. Secondary endpoints included HiSCR50 response rates at weeks 32 and 48, changes in the International Hidradenitis Suppurativa Severity Score System (IHS4), Visual Analog Scale (VAS) scores for pain, Dermatology Life Quality Index (DLQI) scores, and the incidence of adverse events at weeks 16, 32, and 48.

Results: At week 16, the HiSCR50 response rate was 76.2% (16/21), accompanied by a significant 71.3% reduction in the IHS4 score from baseline ($P < 0.001$). Both the DLQI and VAS scores demonstrated notable decreases of 44.2% and 43.7% ($P < 0.001$ for both). By week 48, sustained improvements were observed in HiSCR50 response, IHS4 score, DLQI, and VAS scores, with reduction rates of 75.2%, 57.1%, and 65.3%. Only one patient reported mild eczema, and no serious adverse events were documented.

Conclusion: Secukinumab in combination with surgical intervention rapidly and significantly improves clinical symptoms, quality of life, and pain levels in Chinese patients with moderate-to-severe HS, while demonstrating a favorable safety profile. This combined therapeutic approach may represent a novel treatment option for severe HS; however, further validation through large-scale, multi-center studies is warranted.

Keywords: Secukinumab, Hidradenitis Suppurativa, Inflammatory Diseases, Surgery

Introduction

HS is a chronic, recurrent, and painful inflammatory disorder characterized by the repeated development of tender nodules, abscesses, sinus tracts, and scarring.[1] Follicular occlusion is widely recognized as the initiating event in HS pathogenesis.[2] This blockage leads to the accumulation of follicular contents, such as keratinous debris and sebum, ultimately resulting in follicular rupture. The subsequent release of these contents into the surrounding dermal tissue initiates a local inflammatory cascade. This process involves various cell types, including keratinocytes, fibroblasts, and macrophages, and ultimately leads to tissue destruction and scar formation.[3] Long-term complications of HS include chronic pain, cutaneous contractures,

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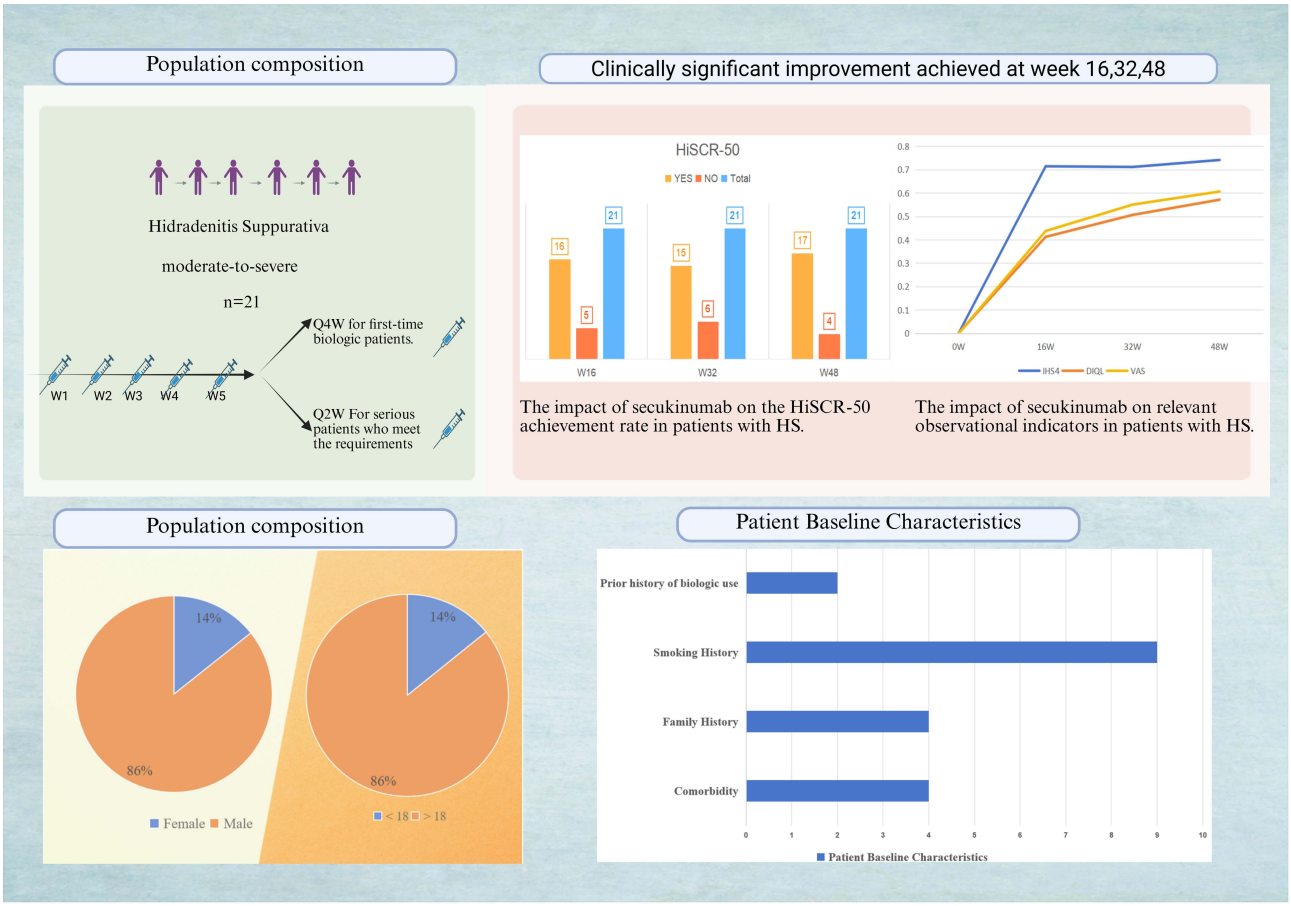
Graphical Abstract



deformities, and restricted mobility, all of which significantly diminish patients' quality of life.[4] Beyond physical impairment, HS can also profoundly affect psychological well-being and elevate the risk of social dysfunction.[5.]

HS is currently understood to involve multiple factors, including genetic predisposition, immune and inflammatory dysregulation, microbial influences, obesity, and smoking. Inflammatory responses are central to HS progression, primarily involving activation of the innate immune system and disruption of inflammatory pathways. Pro-inflammatory cytokines, such as tumor necrosis factor-α (TNF-α), interleukin (IL)-1, and IL-17, play pivotal roles in disease development.[6] With advances in biologic therapies, various agents targeting distinct pathways in HS have demonstrated promising efficacy.[7] These include TNF-α antagonists (such as adalimumab), IL-1 antagonists (such as anakinra and canakinumab), IL-12/23 antagonists (such as ustekinumab), and IL-17A antagonists (such as secukinumab).[8–11] In 2023, secukinumab was approved by both the European Commission (EC) and the US Food and Drug Administration (FDA) for the treatment of moderate-to-severe HS in adults.[12,13] Both early clinical trials and real-world studies have demonstrated its favorable efficacy and safety profile, with low resistance observed over 52 weeks.[10,11] Surgical intervention can effectively reduce the number of inflammatory lesions (abscesses and nodules) and remove irreversible lesions (sinus tracts and scars); however, complete excision is often unachievable in patients with severe HS, and the risk of recurrence persists. Therefore, an integrated management strategy combining monoclonal antibody therapy with surgical intervention may offer substantial benefits in controlling severe HS.

Given the limited research on the use of secukinumab for treating HS in the Chinese population, this study conducts a retrospective analysis to evaluate its efficacy in real-world clinical practice in China. The assessment focuses on clinical response as measured by HiSCR, IHS4, DLQI, VSA, and the safety profile.

Materials and Methods

This retrospective study included patients with HS who received secukinumab treatment between May 2023 and August 2024. The study protocol was approved by the hospital's ethics committee.

Inclusion Criteria

(1) Aged 12 years or older; (2) Diagnosed with moderate to severe HS (Hurley Stage III or IHS4 score > 10 points); (3) Clinical diagnosis of the condition for more than one year prior to the use of Secukinumab, and unresponsive to other systemic treatments; (4) Regular follow-up for more than four months post-treatment. (5) Inclusion Criteria for Surgery: Patients with Hurley stage III disease or an IHS4 score >10, accompanied by recurrent acute nodules and abscesses with irreversible skin lesions (eg, scarring, sinus tracts), should be considered for surgical intervention.

Exclusion Criteria

(1) Medication usage for less than 48W; (2) Loss to follow-up before completing 48W of treatment; (3) Irregular medication intake not adhering to the prescribed treatment regimen.

Treatment Methods

In this study, one patient received secukinumab therapy alone, while the remaining patients underwent palliative surgery for abscesses and sinus tracts, followed by concurrent administration of secukinumab one week after the procedure.

Standard Regimen: The initial treatment followed the conventional psoriasis protocol: subcutaneous administration of 300 mg weekly for five consecutive weeks, followed by maintenance dosing every four weeks (SecukinumabQ4W, secQ4W regimen).

Modified Regimen: Modified Protocol (Sec Q2W): Restart the loading phase treatment (300 mg weekly for 5 weeks), followed by subcutaneous injection of 300 mg every two weeks (Sec Q2W), in combination with palliative surgical intervention. This protocol is suitable for the following situations: inadequate response to previous Sec therapy; suboptimal efficacy after four months of the current treatment; or sudden disease exacerbation during the stable phase (Case 14).

Efficacy Evaluation Endpoints

Primary Endpoint: The proportion of patients achieving HiSCR at Weeks 16, 32, and 48.

Secondary Endpoints: International IHS4, DLQI score, VAS score, and adverse events assessed at Weeks 16, 32, and 48.

Statistical Analyses

Statistical analysis was conducted using the SPSS 26.0 software. Variables such as age, disease duration, Body Mass Index (BMI), IHS4, VAS score, and DIQL score were expressed as mean (x) or mean ± standard deviation (x±s). The efficacy was represented as a percentage. For quantitative data that conformed to a normal distribution, the *t*-test was used, while the rank-sum test was applied to data that did not follow a normal distribution. A p-value of less than 0.01 was considered statistically significant.

Results

In this study, 24 patients with hidradenitis suppurativa (HS) were initially enrolled. Three patients were subsequently excluded (two due to medication discontinuation before completing the 32-week treatment period and one lost to follow-up), resulting in a final cohort of 21 patients (18 males [85.7%], 3 females [14.3%]). Participants had a mean age of 24.2 ± 7.9 years (range: 15–42 years), including 3 adolescents (14.3%) under 18 years, and a mean disease duration of 5.8 ± 5.5 years since diagnosis. All patients (100%) presented with severe disease (Hurley stage III), reflected by a mean baseline IHS4 score of 47.5 ± 27.1.

The cohort had a mean body mass index (BMI) of 29.8 ± 5.2 kg/m², categorized as normal weight (≤25 kg/m²; 19.0%, n=4), overweight (25–30 kg/m²; 28.6%, n=6), and obese (≥30 kg/m²; 52.4%, n=11). Relevant history included a family history of HS in 4 patients (19.0%), current smoking in 9 patients (42.9%), and immune-related comorbidities (diabetes [n=2], psoriasis [n=1], keloid [n=1]) in 4 patients (19.0%). Two patients (9.5%) had prior exposure to biologic therapy (secukinumab). The mean baseline IHS4 score was 47.5 ± 27.1, indicating severe disease. The mean baseline DLQI score was 23.1, and the mean baseline VAS score was 7.1, both reflecting a substantial impact of the disease on quality of life.

Efficacy Outcomes: Primary Endpoint: At week 16, 76.2% of patients (16 out of 21) achieved a HiSCR50 response. Secondary Endpoints: The HiSCR50 response rates were 71.4% (15/21) at week 32 and 81.0% (17/21) at week 48. The IHS4 score demonstrated a significant reduction from baseline, with mean decreases of 64% (17.1 points) at week 8, 71.3% (13.6 points) at week 16, and 78.7% (10.1 points) at week 48 (all $P < 0.001$). The mean DLQI score declined from 23.1 at baseline to 12.9 at week 16 (a 44.2% reduction), 11.4 at week 32 (a 50.6% reduction), and 9.6 at week 48 (a 58.4% reduction) (all $P < 0.001$). Similarly, the mean VAS score decreased from 7.1 at baseline to 4.0 at week 16 (a 43.7% reduction) and to 2.7 at week 48 (a 65.3% reduction) (all $P < 0.001$). Adverse events were limited to a single case (4.8%) of eczema. Detailed data are also presented in Table 1 and Figure 1.

Discussion

This study demonstrates that combining surgery with secukinumab therapy enables patients with severe HS to achieve HiSCR50 responses more rapidly and accelerates improvements in IHS4, DLQI, and VAS scores. Consequently, patients experience significant clinical benefits earlier in the course of treatment.

The current perspective on the management of hidradenitis suppurativa (HS) emphasizes that surgical and pharmacological interventions are not mutually exclusive alternatives but rather complementary approaches. Surgery provides localized control by removing structural damage—such as sinus tracts and scar tissue—that is unresponsive to medication. In contrast, pharmacotherapy exerts systemic control by suppressing aberrant inflammatory responses throughout the body, thereby reducing the risk of recurrence beyond the surgical site and creating a favorable environment for postoperative wound healing. Among Asian populations, the recurrence rate following complete excision for HS is approximately one-third, with gender, surgical site, and repair method identified as primary influencing factors.[14] In the present study, all enrolled patients were classified as Hurley stage III, indicative of severe disease with increased surgical complexity and a heightened risk of recurrence. Given the significant efficacy of secukinumab demonstrated in Phase III clinical trials conducted internationally, and considering the specific circumstances of our patient cohort, we innovatively implemented partial excision of scarred sinus tracts and inflammatory lesions in severe cases. This was followed by postoperative administration of secukinumab to maintain therapeutic efficacy and reduce the recurrence rate.

Taking into account the success rate, recurrence rate, surgical complexity, and recovery period, the STEEP procedure is considered a feasible option for patients with Hurley stage II or III HS.[15,16] Based on prior experience, we modified the STEEP procedure in this study (see Figure 2), primarily by reducing the extent of deroofing, maximizing preservation of healthy tissue, and ensuring complete wound closure. This approach offers advantages such as faster healing, smaller scars, and a lower incidence of contracture. Most incisions healed within four weeks, while a minority required up to eight weeks, which is notably shorter than the average closure time of 81.3 days reported in the literature for the STEEP procedure.[17] However, the conservative nature of the modified debridement may be associated with a higher potential risk of recurrence, thereby necessitating combination therapy with secukinumab to ensure sustained efficacy.

Previous large-scale studies have reported that secukinumab monotherapy, without adjunctive surgical intervention, achieves HiSCR50 response rates of approximately 45.4%–57.1% at week 16 and 50.8%–71.4% at week 52.[10,11] A 104-week extension study further demonstrated that sustained secukinumab treatment can maintain clinical response with a favorable safety profile.[18] In contrast, patients in the present study exhibited higher baseline IHS4 scores (mean 47.5), and all were classified as Hurley stage III, indicating greater disease severity and inflammatory burden. Nevertheless, the combination therapy group achieved significantly higher HiSCR50 response rates at weeks 16 and 48 (76.2% and 81.0%) compared to international monotherapy studies. We hypothesize that this advantage may result from the synergistic effect of combining surgery with secukinumab: inflammatory lesions in HS are prone to bacterial colonization, which exacerbates dysregulated immune responses and drives disease progression.[19,20] Surgical excision of HS lesions prior

Table 1 Clinical Efficacy and Adverse Events of Secukinumab Treating HS in China

ID	Dose		Symptom Improvement Indicators																Adverse Events
	Sec Q4W	Sec Q2W	HiSCR-50			IHS4					DIQL				VAS				
			16W	32W	48W	0W	8W	16W	32W	48W	0W	16W	32W	48W	0W	16W	32W	48W	
1	Y		Y	Y	Y	122	82	58	52	42	30	20	18	15	10	6	4	3	
2	Y		N	N	N	89	56	54	50	48	27	22	19	21	8	7	4	5	
3	Y		Y	N	Y	57	18	12	41	4	25	16	21	7	8	5	7	3	
4	Y		Y	Y	Y	29	3	2	0	4	22	8	5	5	7	4	2	2	Eczema
5	Y		Y	Y	Y	32	10	3	1	2	22	14	12	10	7	4	4	3	
6	Y		N	N	N	62	16	8	13	14	28	22	17	19	9	5	4	5	
7	Y		Y	Y	Y	32	22	8	4	4	21	10	8	6	7	4	3	3	
8	Y		Y	Y	Y	29	14	9	8	6	21	15	12	8	7	6	3	3	
9	Y		Y	Y	Y	11	0	0	0	0	15	6	5	3	5	2	1	1	
10	Y		N	N	N	69	24	38	32	28	25	19	20	18	6	4	5	4	
11	Y		Y	Y	Y	33	6	3	4	3	24	10	7	6	6	3	3	2	
12	Y		Y	Y	Y	26	5	5	9	3	21	10	11	6	6	4	4	3	
13	Y		Y	Y	Y	30	6	2	2	4	23	11	7	4	7	4	3	2	
14		Y	Y	Y	Y	69	10	2	0	0	24	10	7	5	6	3	1	1	
15	Y		N	N	N	53	24	30	28	24	29	20	21	20	9	4	4	3	
16	Y		Y	Y	Y	19	5	3	2	3	20	10	5	5	7	3	2	2	
17	Y		Y	Y	Y	60	22	10	4	3	26	13	6	6	8	4	2	2	
18	Y		Y	Y	Y	34	7	4	6	4	22	7	9	11	6	2	3	3	

(*Continued*)

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Table 1 (Continued).

ID	Dose		Symptom Improvement Indicators																Adverse Events
	Sec Q4W	Sec Q2W	HiSCR-50			IHS4					DIQL				VAS				
			16W	32W	48W	0W	8W	16W	32W	48W	0W	16W	32W	48W	0W	16W	32W	48W	
19	Y		Y	Y	Y	87	16	8	6	7	24	9	7	7	7	4	2	2	
20	Y		Y	Y	Y	26	2	0	0	7	18	5	3	4	6	3	1	1	
21	Y		N	N	Y	29	12	15	20	1	19	14	19	15	7	4	5	4	
MEAN x						47.5	17.1	13.6	13.4	10.1	23.1	12.9	11.4	9.6	7.1	4	3.2	2.7	
P value						<0.001					<0.001				<0.001				
Percentage%			76.2	71.4	81	0	64	71.4	71.8	78.7	0	44.2	50.6	58.4	0	43.7	55	61.9	

Figure 1 Changes in IHS4, DLQI, VAS values from baseline to week 48 in patients previously treated with secukinumab combined surgery. The data show that the rate of decrease in IHS4, DLQI, VAS gradually increases with the duration of treatment (**A**); IHS4 (**B**), DLQI (**C**), VAS (**D**) values are significantly reduced at baseline in all cases at week 16.

to biologic therapy can effectively reduce bacterial load and chronic inflammatory stimulation, thereby improving the local immune microenvironment and enhancing the efficacy of subsequent biologic treatment. Additionally, real-world studies of secukinumab in psoriasis suggest that genetic backgrounds in Asian populations may influence IL-17A pathway activity, with Chinese patients potentially exhibiting greater therapeutic responses,[21,22] which may also contribute to the favorable outcomes observed in this study. Notably, the HiSCR50 response rate at week 32 (71.4%) was slightly lower than at week 16 (76.2%), primarily due to one patient (case 3) who experienced a sudden flare of inflammatory papules and nodules around week 32, likely triggered by academic examination stress. Following a second surgical intervention and re-initiation of the secukinumab loading phase after the examination period, this patient ultimately achieved disease stabilization and HiSCR50 at week 48.

The significant improvements observed across multiple assessment indicators underscore the efficacy of the combination therapy. Owing to the rapid removal of lesions via surgical intervention, all patients experienced a marked reduction in IHS4 scores as early as week 8, with a 64% decrease—substantially greater than the approximately 42% reduction reported at week 12 with monotherapy in international studies.[8] The sustained decline in IHS4 scores (71.3% at week 16 and 78.7% at week 48) further corroborates the long-term therapeutic stability of the combined regimen. Additionally, DLQI scores improved significantly by week 16 (a 44.2% reduction), with continued enhancement observed at week 48 (a 58.4% reduction), indicating a notable improvement in patients' quality of life. Baseline VAS scores reflected severe pain (7.1 points); the combination therapy yielded rapid pain relief, with scores decreasing to moderate levels (4.0 points) at week 16 and to mild levels (2.7 points) at week 48.

This study included two patients with a history of prior Sec treatment. Case 5 had previously responded well to Sec monotherapy but experienced a relapse after discontinuing the medication on their own; efficacy was restored following combination therapy. Case 15 (with comorbid diabetes and obesity) did not achieve the expected outcome with Sec Q4W monotherapy in the early stage; after switching to a regimen of surgery combined with Sec Q2W, although HiSCR50 was not reached at week 48, both the IHS4 and VAS scores improved significantly (IHS4 decreased from 58 to 24, VAS from

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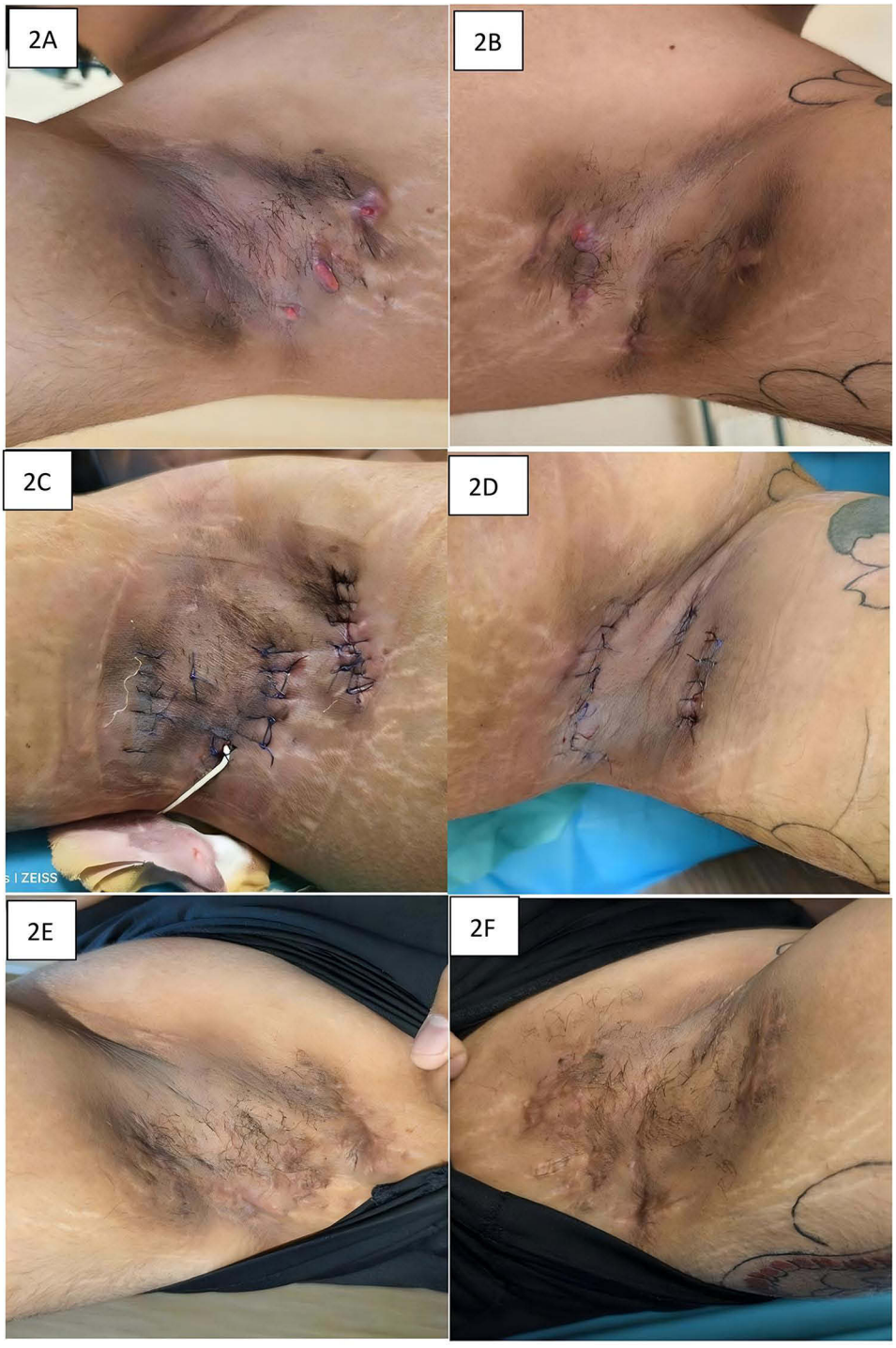

Figure 2 Surgery example. (**A** and **B**) Multiple abscesses and sinus tracts in both axils before operation, pus outflow can be seen when squeezed, and subcutaneous scar formation can be touched; (**C** and **D**) Suture wound after operation; (**E** and **F**) 28 weeks after surgery, the original rash has subsided with no significant new rashes appearing, and a scar remains at the incision site.

9 to 3), suggesting that combination therapy and the Sec Q2W regimen may be more effective than Sec Q4W. Although current guidelines approve Sec for use in adult HS, considering its established safety profile in children aged ≥6 years with psoriasis, this study cautiously applied Sec Q4W in three severe adolescent patients approaching adult body weight (aged 15, 16, and 17 years respectively), all of whom achieved excellent therapeutic outcomes. We propose that this regimen may be considered as an off-label treatment for older, overweight adolescents, providing preliminary clinical

experience for Sec in pediatric HS. Only one case of mild eczematous adverse reaction was observed during treatment, with no serious adverse events, further confirming its favorable safety profile.

The data in this study were derived from a retrospective analysis of actual clinical treatment cases. All enrolled subjects were patients with severe HS, lacking comparative efficacy data against moderate HS patients or surgery-only treatment approaches. Moreover, the research was conducted at a single center with a limited sample size. Significant fluctuations in the data could arise from variations in individual disease courses, compromising the robustness of the findingsTherefore, to comprehensively validate the therapeutic efficacy and clinical application value of surgery combined with Secukinumab in HS treatment, and to establish definitive clinical standards for the combined regimen, a prospective, large-scale, multi-center, controlled trial will be conducted in the future.

Conclusion

This study demonstrates that combination therapy with Secukinumab and surgery induced HiSCR50 response more rapidly, accelerated improvements in IHS4, DLQI, and VAS score. Secukinumab exhibited promising efficacy and a favorable safety profile in Chinese patients with severe HS. The combined strategy of surgery and Secukinumab offers a novel therapeutic approach for severe refractory HS. This represents the first systematic report of real-world effectiveness data for Secukinumab treatment in Chinese patients with moderate-to-severe HS. However, due to the relatively small sample size and short observation period, larger-scale, multi-center studies with long-term follow-up are warranted to further confirm these findings.

Abbreviations

HiSCR50, Hidradenitis Suppurativa Clinical Response; IHS4, International Hidradenitis Suppurativa Severity Score System; DLQI, Dermatology Life Quality Index; VAS, pain Visual Analogue Scale; AEs, incidence of adverse events; HS, Hidradenitis suppurativa; TNF-α, tumor necrosis factor-alpha; IL-1, interleukin-1; IL-17, interleukin-17; BMI, Body Mass Index.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Informed Consent Statement

This study has been approved by the Ethics Committee of Tianjin Academy of Traditional Chinese Medicine Affiliated Hospital (Approval No.: LLKY2025-73).

The publication of this research does not contain any identifiable patient information and will have no direct or indirect impacts on patients; therefore, informed consent from research participants is not required. This study complies with the Ethical Review Measures for Life Sciences and Medicine Research Involving Humans (2023) issued by China's National Health Commission and adheres to the principles outlined in the Declaration of Helsinki. The specific approval documents can be found in the attachment Ethics Statement.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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