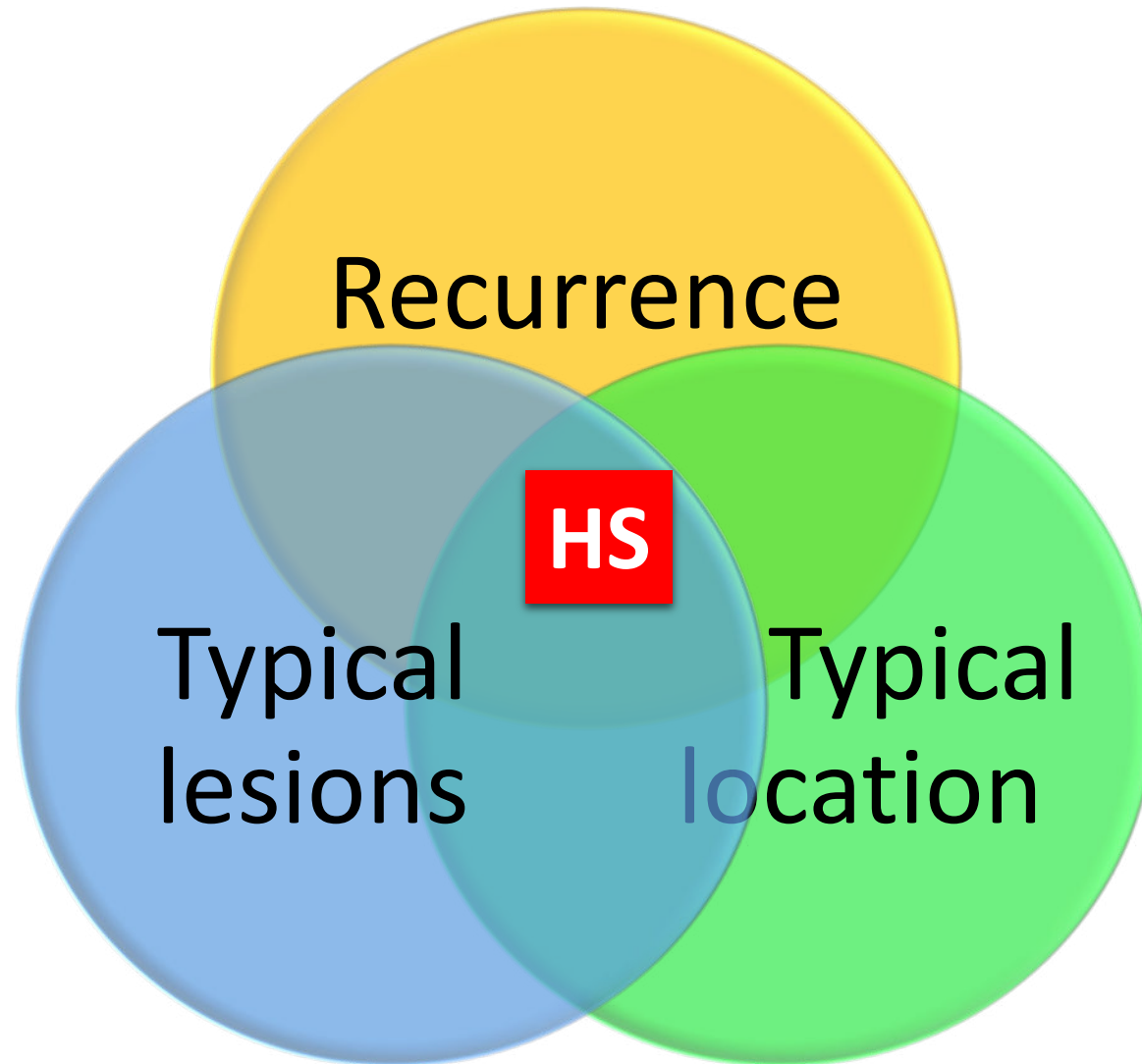


Hidradenitis Suppurativa

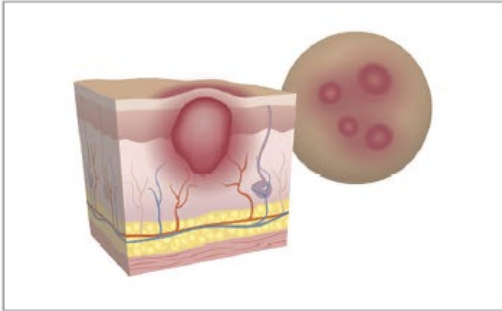
Hadar Lev-Tov, MD

HS diagnosis

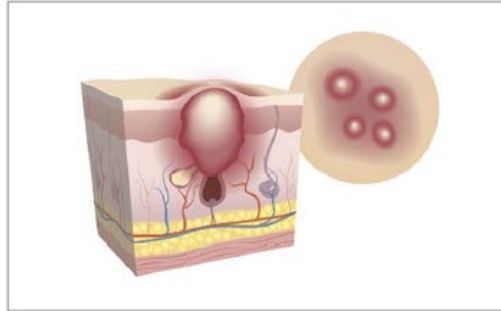


Typical lesions

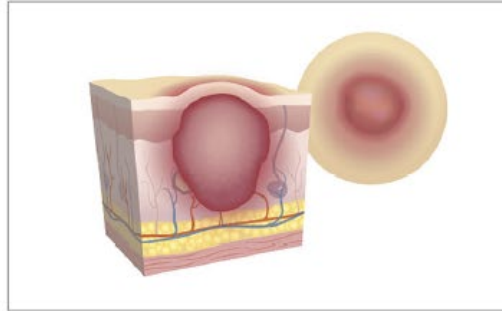
A Papule



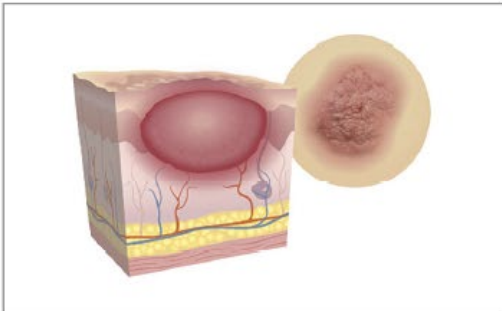
B Pustule



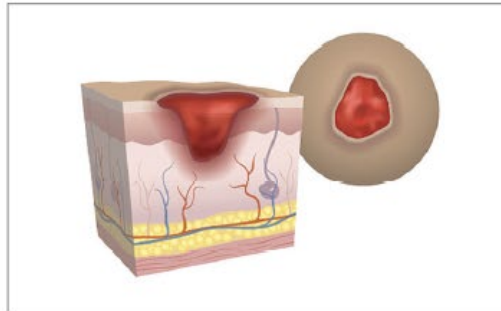
C Nodule



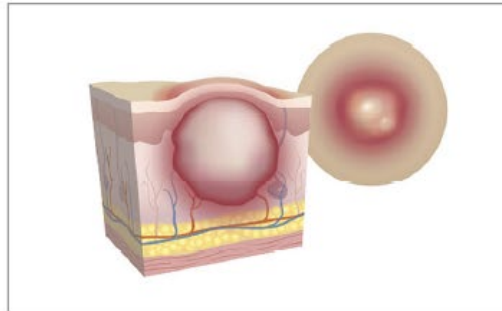
D Plaque



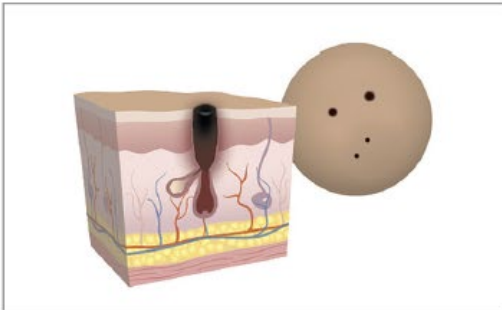
E Ulcer



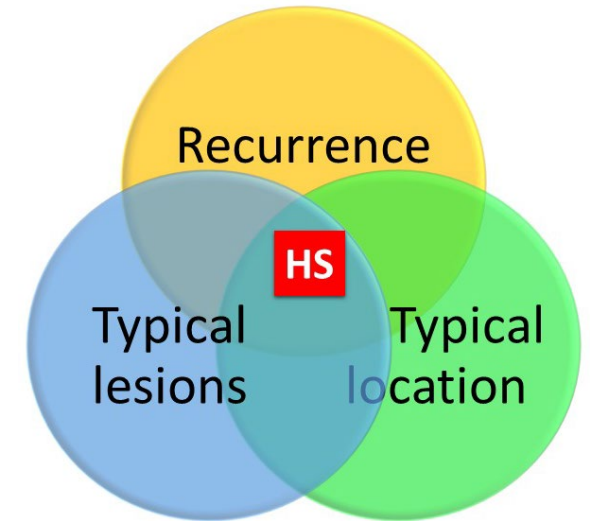
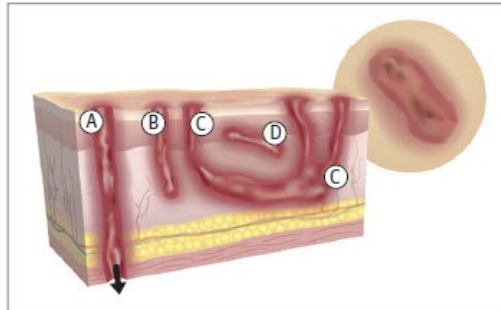
F Abscess



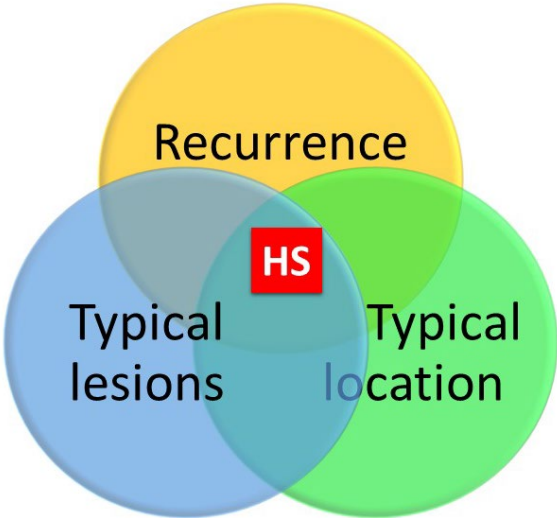
G Comedo



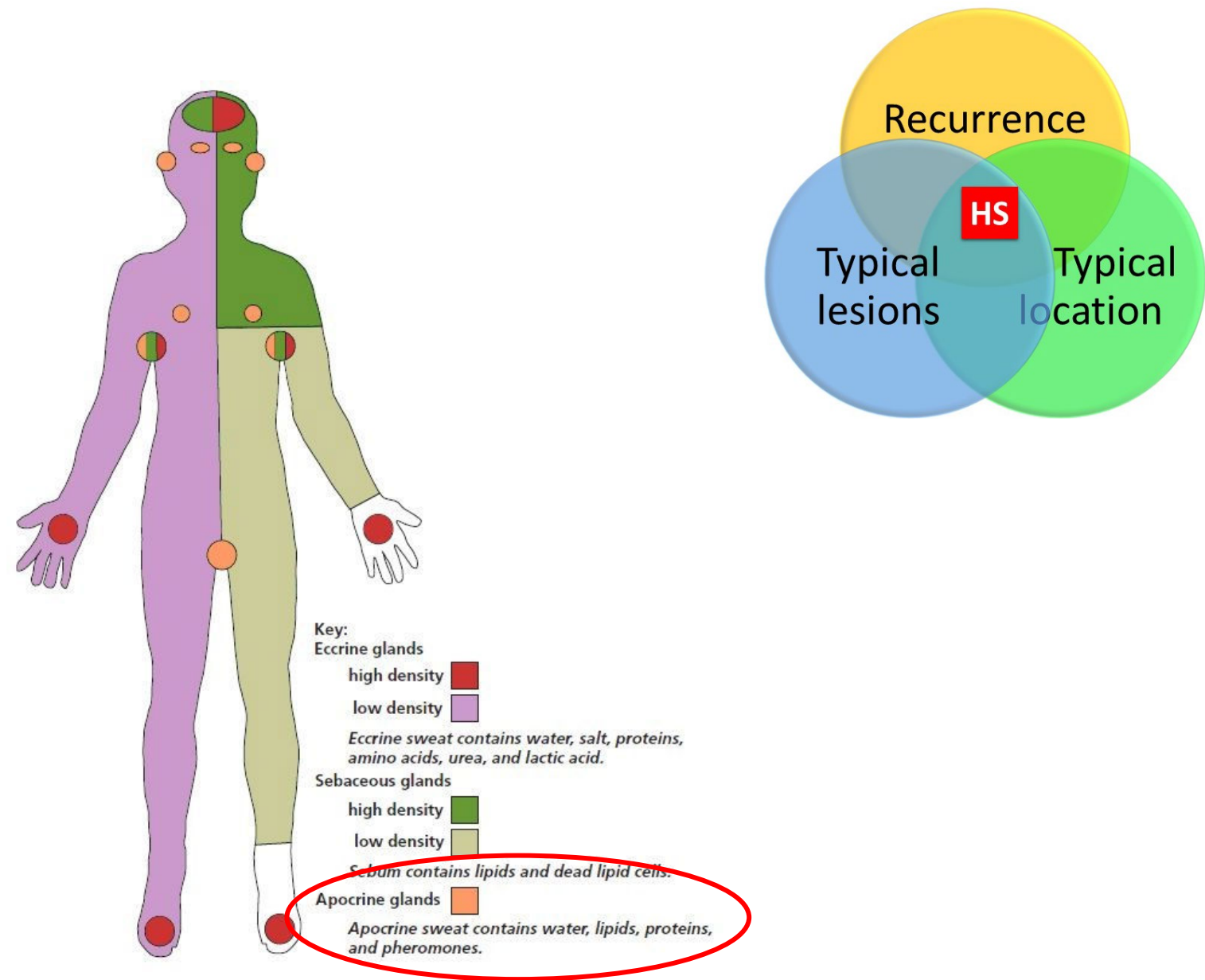
H Tunnel



Typical lesions

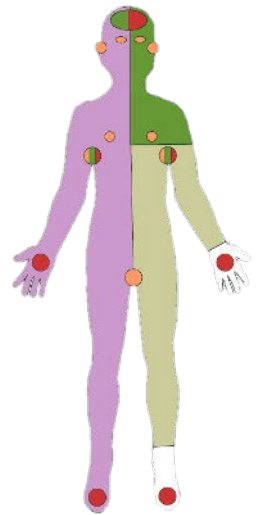
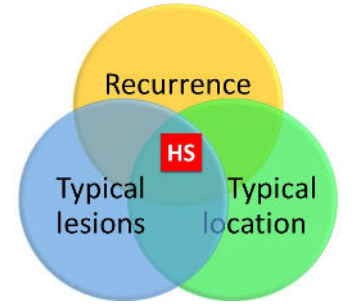


Typical location

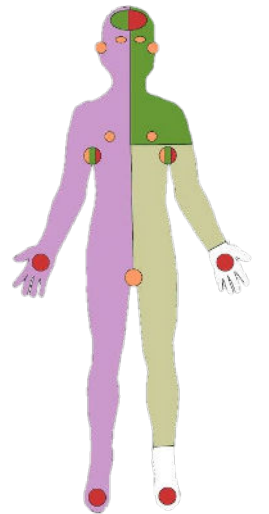
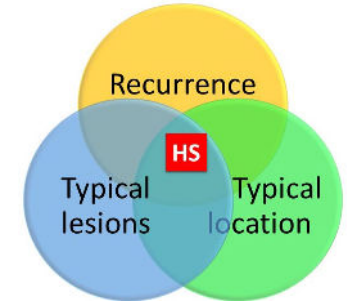


Primary locations of eccrine, sebaceous, and apocrine glands on the human body.

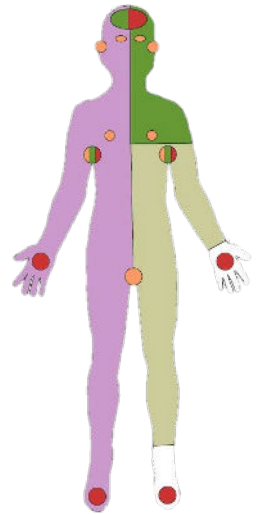
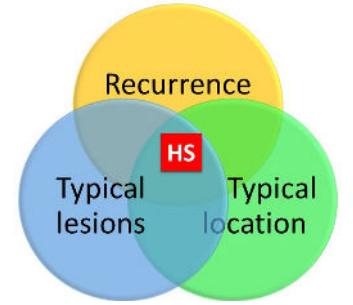
Typical location



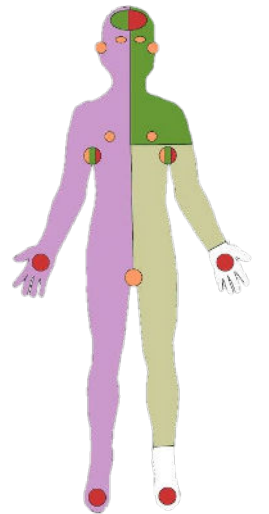
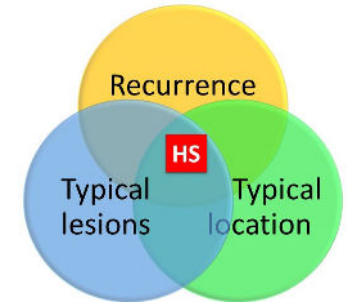
Typical location



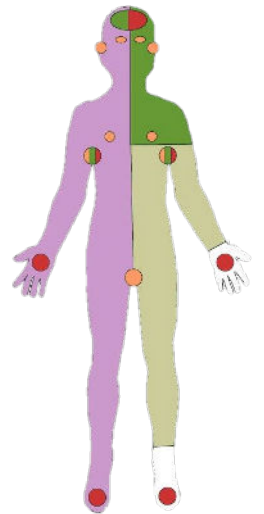
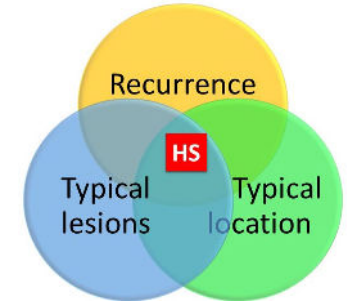
Typical location



Typical location

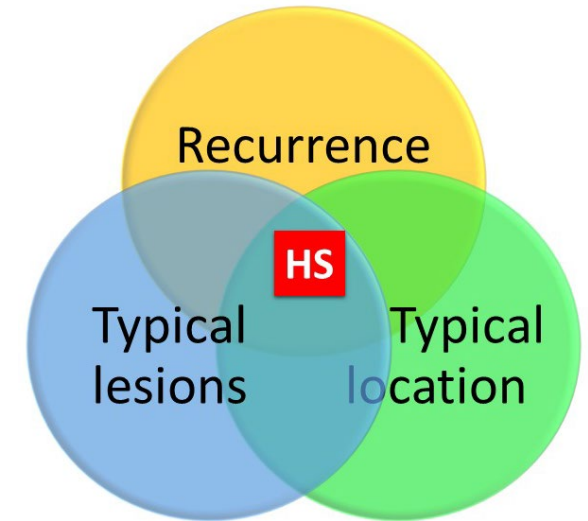


Typical location



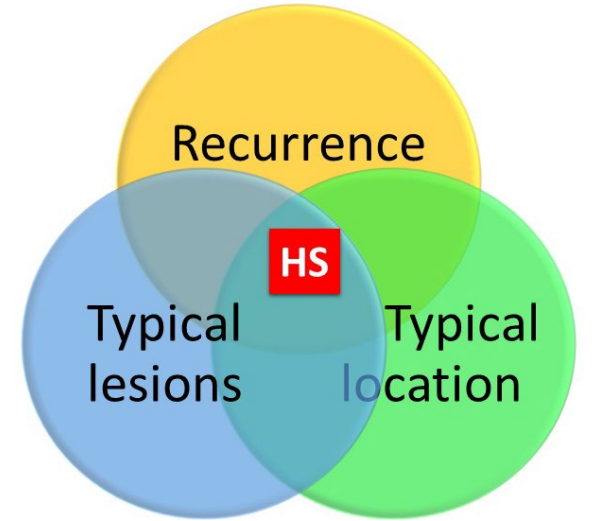
Recurrence

Primary questions	SE	SP	PPV
Question 1 Do you repeatedly have outbreaks of big sore or painful nodules or boils that heal with scars in any of these locations:			
Indirectly yes to boils (HS = 72, Controls = 13) $P < 0.0001$	0.97	0.82	0.85
Groins (HS = 60, Controls = 6) $P < 0.0001$	0.81	0.92	0.91
Armpits (HS = 49, Controls = 7) $P < 0.0001$	0.66	0.91	0.88
Sexual organs (HS = 43, Controls = 6) $P < 0.0001$	0.58	0.92	0.88
Anal region (HS = 23, Controls = 3) $P < 0.0001$	0.31	0.96	0.88
Under the breasts (HS = 15, Controls = 2) $P = 0.001$	0.20	0.97	0.88
Folds on the stomach/around the navel (HS = 10, Controls = 1) $P = 0.005$	0.14	0.99	0.91
Question 8 During the last 12 months did you repeatedly have big painful nodules or boils located in the armpits or in the groins, a disease called hidradenitis?			
Yes (HS = 67, Controls = 8) $P < 0.0001$	0.92	0.86	0.89
Question 10 Have you had outbreaks of boils during the last 6 months?			
Yes (HS = 70, Controls = 11) $P < 0.0001$	0.95	0.85	0.86
Groins (HS = 53, Controls = 3) $P < 0.0001$	0.72	0.97	0.96
Armpits (HS = 37, Controls = 4) $P < 0.0001$	0.50	0.95	0.90
Sexual organs (HS = 31, Controls = 2) $P < 0.0001$	0.42	0.97	0.94
Under the breasts (HS = 9, Controls = 2) $P = 0.028$	0.12	0.97	0.82
Other locations (HS = 26, Controls = 4) $P < 0.0001$	0.35	0.91	0.79



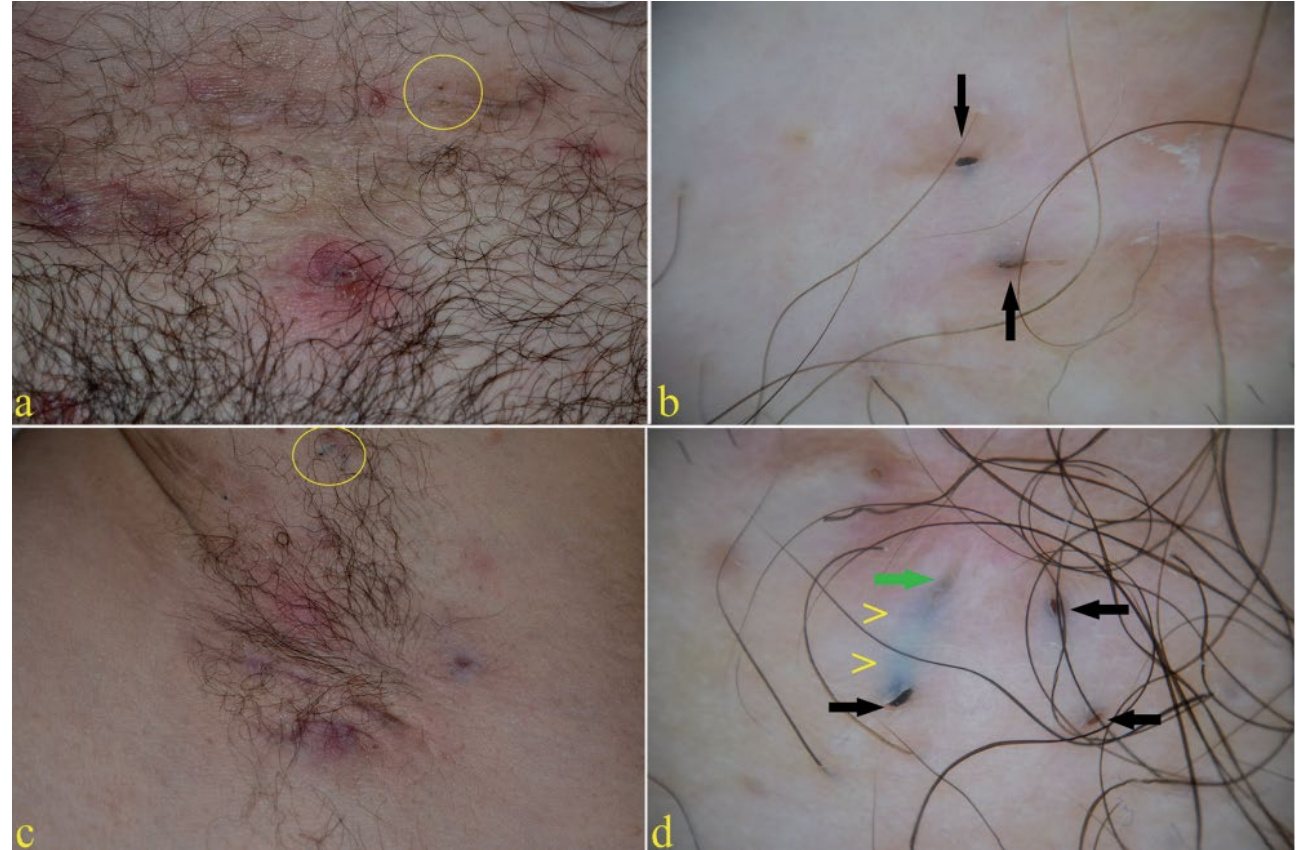
- No universally agreed time span
- 6 and 12 months seem to make sense
- But nothing beats a good physical exam....

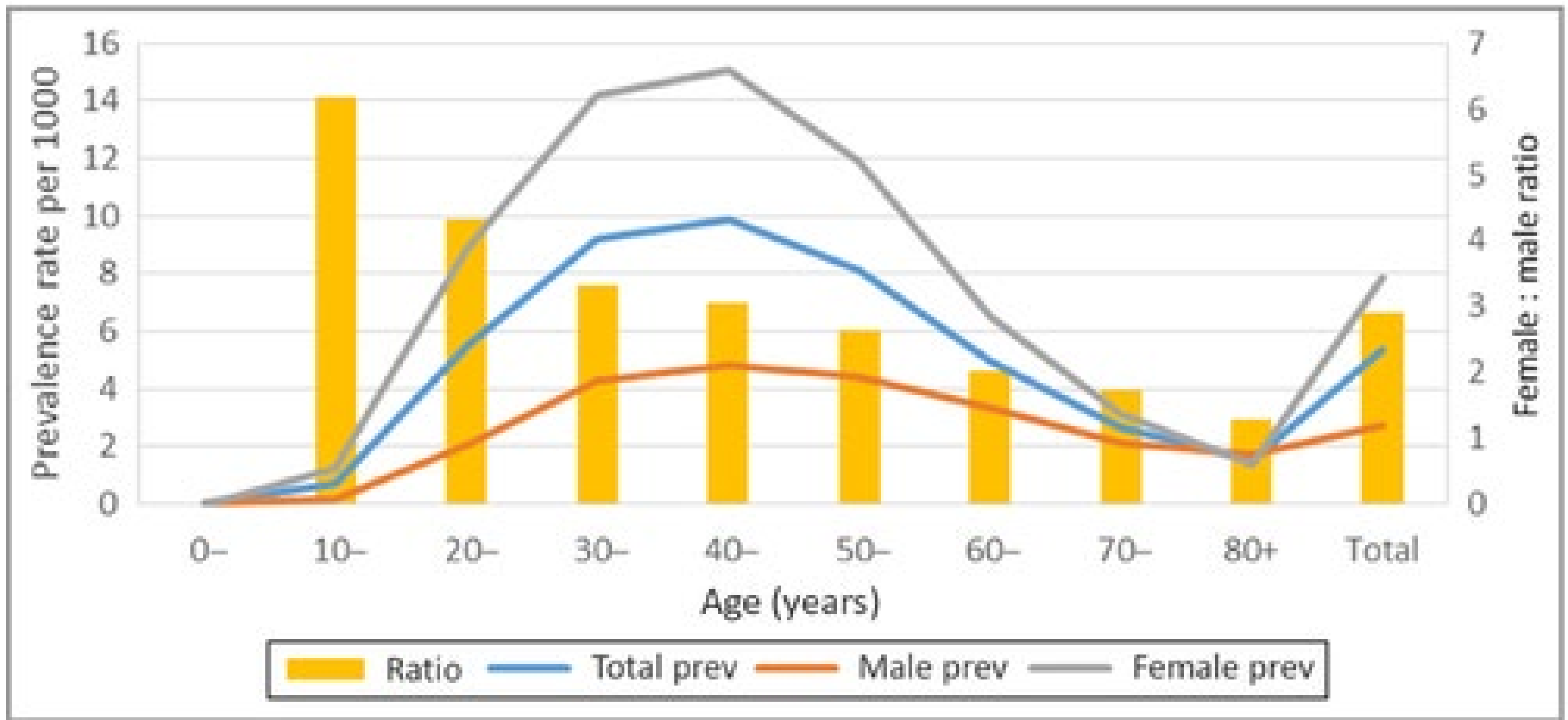
Recurrence



Other features

- Pain
- Suppuration
- Scarring
- Double headed comedones





Overall prevalence in the west ~ 1%

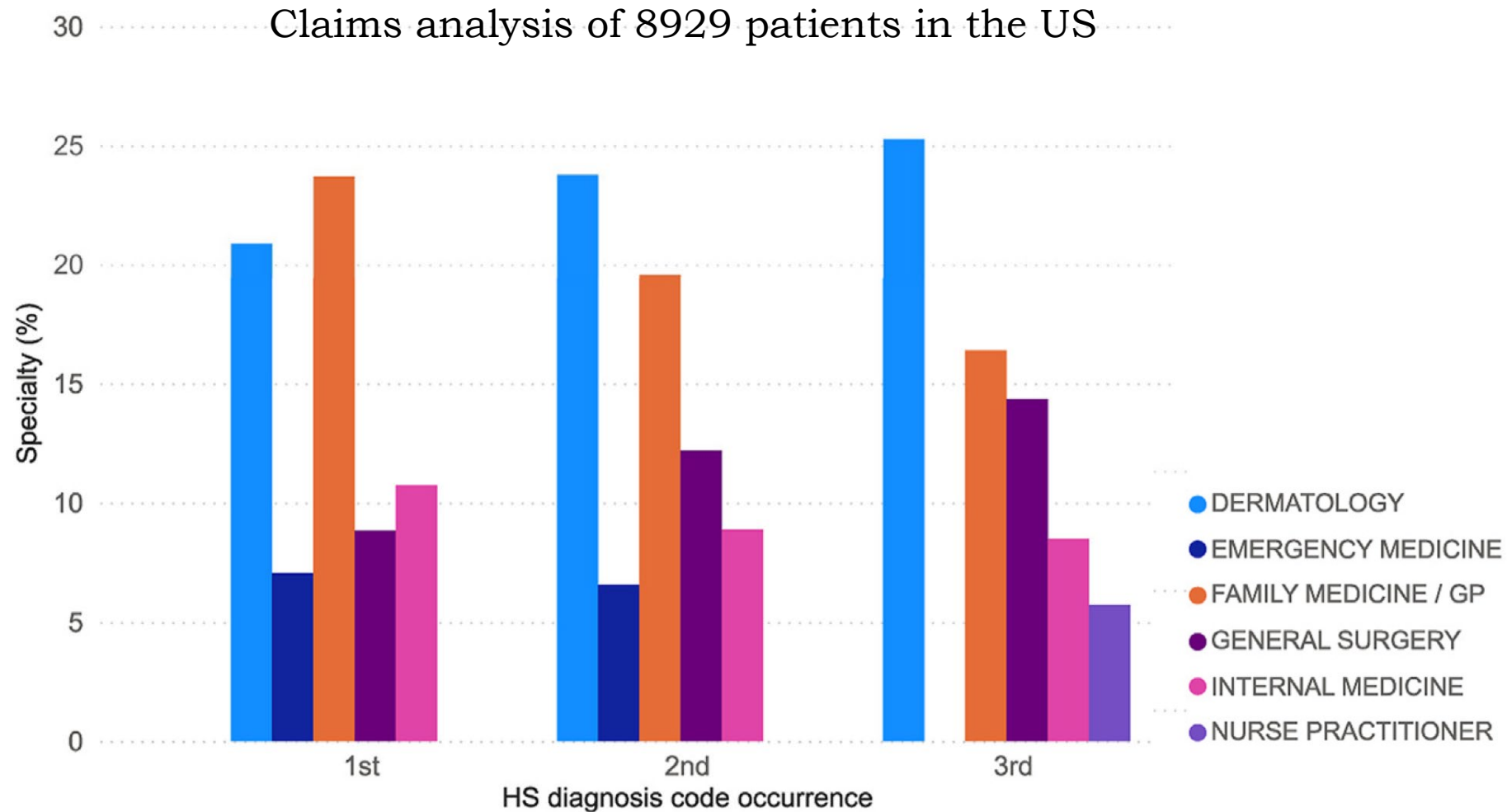
Pediatric HS prevalence rises with age

Younger than 9 YO = 0.002%

10 - 14 YO = 0.027%

15 - 17 YO = 0.114%

Patient journey



Hurley Stage I (mild)

Hurley Stage II (moderate)

Hurley Stage III (severe)



Nodules & abscesses



Tunnels

Medical Treatment

Discuss pain management, mental health, wound care, avoidance of triggers, tobacco cessation, weight reduction

Tetracyclines

Rifampin + Clindamycin

Anti-TNF (adalimumab, infliximab)

Moxifloxacin + Rifampin + Metronidazole

IV ertapenem

Hormonal treatment

Retinoids

Other biologics (anakinra, ustekinumab)

Procedural Treatment

Nd:Yag Laser

Local excisions

Deroofing (surgery or CO2)

Wide surgical excision (or CO2)

Acute Lesions (all Stages)

Antiseptic washes, warm compresses, short-term oral steroids

IL steroids, I&D, topical resorcinol, deroofing

Hurley Staging Refined: A Proposal by the Dutch Hidradenitis Suppurativa Expert Group

Barbara HORVÁTH^{1,6}, Ineke C. JANSE^{1,6}, Janine L. BLOK^{1,6}, Rieke J. B. DRIESSEN², Jurr BOER^{3,6}, Jan R. MEKKES⁴, Errol P. PRENS^{5,6} and Hessel H. VAN DER ZEE^{5,6} *Acta Derm Venereol* 2017; 97: 412–413

	A: Mild	B: Moderate	C: Severe
Hurley I	 <p>1. Topical clindamycine* 2. Tetracyclines</p>	 <p>Medical treatment in combination with surgery: 1. Topical clindamycine* 2. Tetracyclines 3. Clindamycine + Rifampicine</p>	 <p>Systemic medication: 1. Tetracyclines 2. Clindamycine + Rifampicine 3. Adalimumab 4. Infliximab 5. Acitretine 6. other 2nd and 3rd line therapies**</p>
Hurley II	 <p>1. Surgery:</p>	 <p>Systemic medication in combination with surgery: 1. Tetracyclines 2. Clindamycin + Rifampicin</p>	 <p>Systemic medication in combination with surgery: 1. Tetracyclines 2. Clindamycine + Rifampicine 3. Adalimumab 4. Infliximab 5. Other 2nd and 3rd line therapies**</p>
Hurley III	 <p>Systemic medication in combination with surgery: 1. Clindamycine + Rifampicine 2. Adalimumab 3. Infliximab 4. Other 2nd and 3rd line therapies**</p>		

* < 3 months

** ustekinumab, anakinra, dapsone, cyclosporine

NOTE

- acute lesions can be treated with: topical resorcinol (TID) or intralesional corticosteroids
- abscesses can be treated with incision and drainage

Fig. S2. Rationale for treatments based on the modified Hurley classification.

ANTI-INFLAMMATORY THERAPY

© 2021



Scarring tissue destruction

SURGERY

Case #1

16 YOF

PMD gave her doxycycline for two weeks and the lesions improved but then recurred.



Mild/nodular disease options:
Clindamycin

ANTI-INFLAMMATORY THERAPY

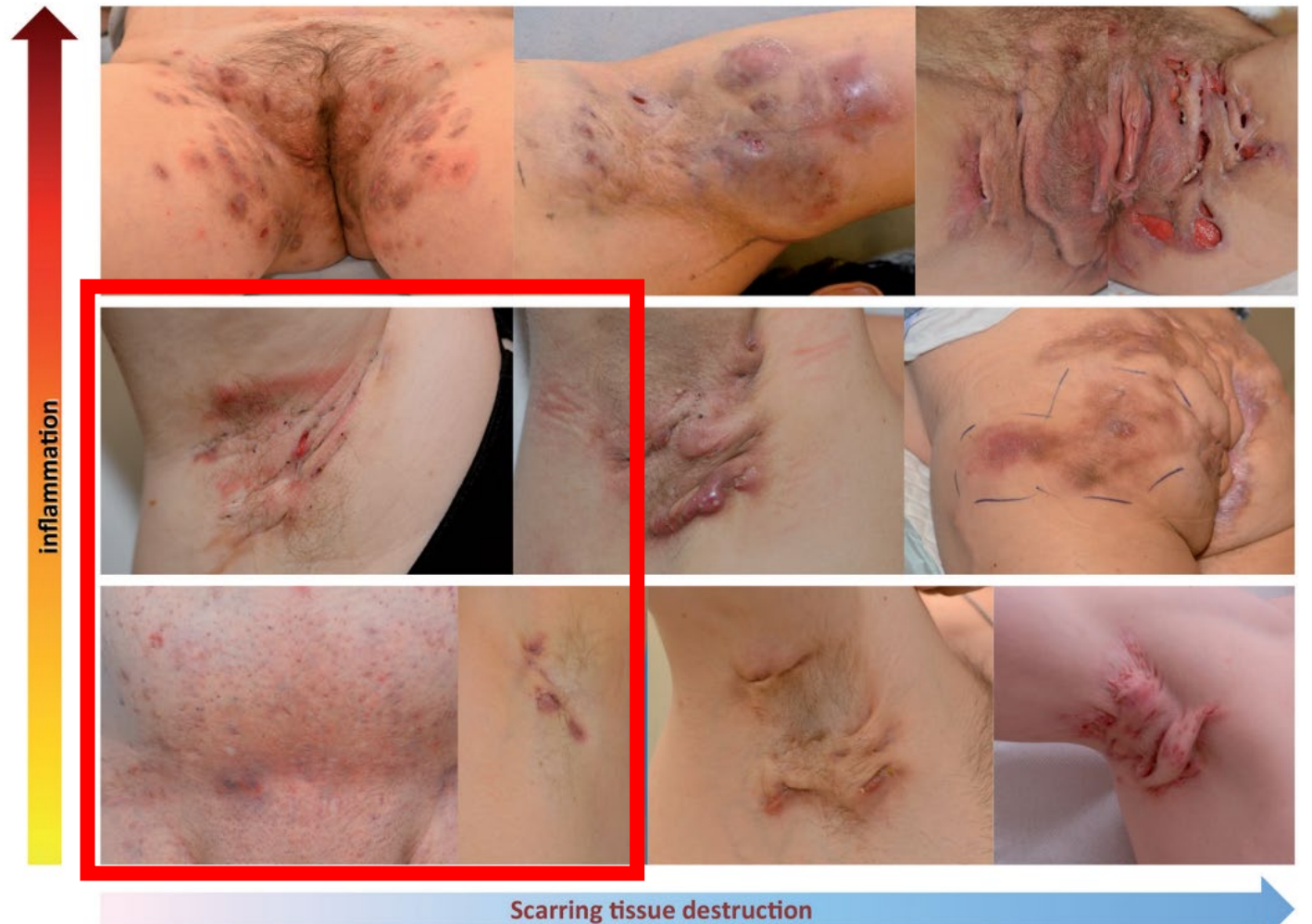


Fig. S1. The dual character of hidradenitis suppurativa (HS); inflammation and sinus tract formation.

Resorcinol: chemical peeling agent keratolytic and anti-inflammatory properties and may contribute to the prevention of antibiotic resistance

60 HS-I and IHS4 ≤ 10 . open label, prospective, randomized trial. 24 weeks.

Group A: topical resorcinol 10%, in an oil/water cream BID. Group B: clindamycin 1% topically. Group C: no treatment

IHS4

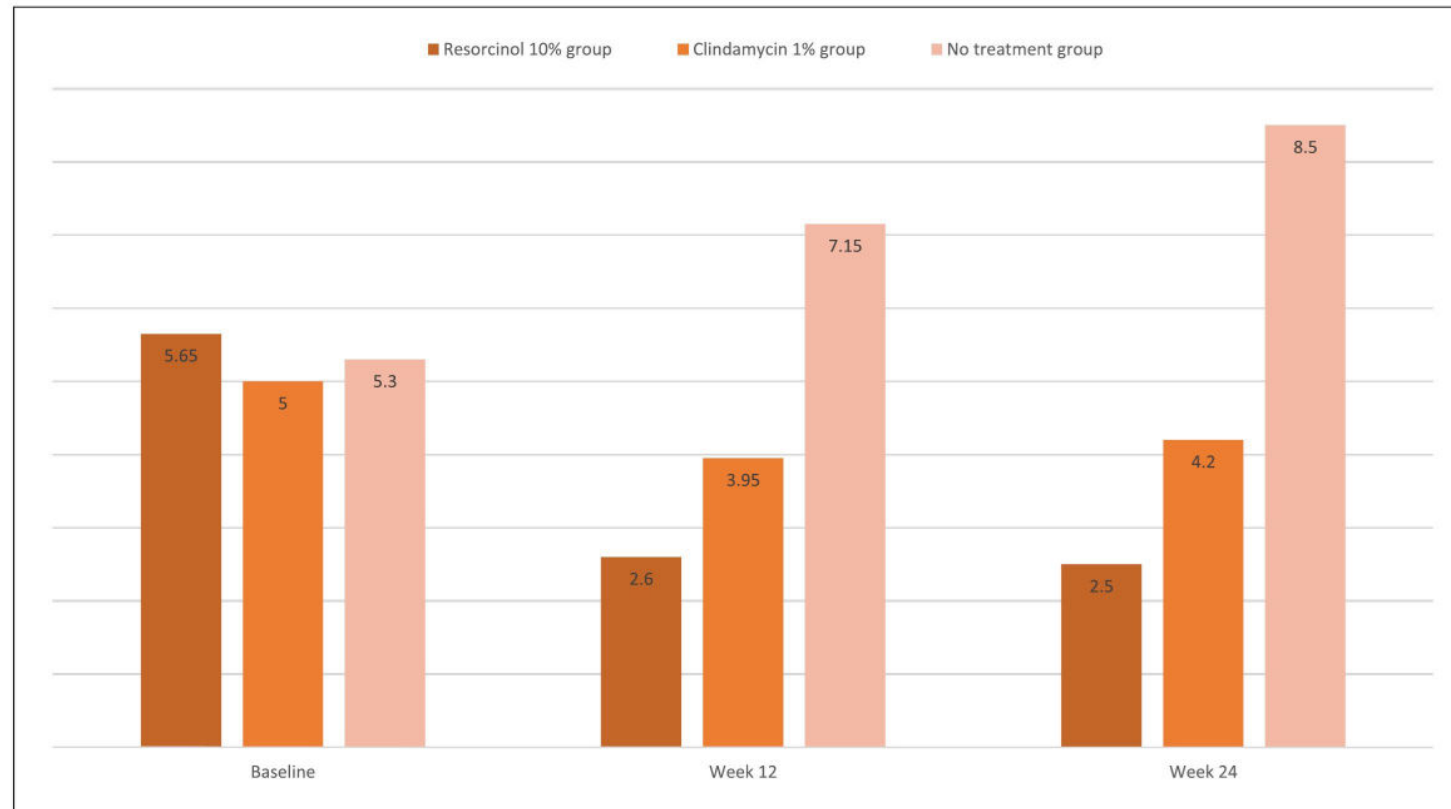


Fig. 1. Mean IHS4 scores in the different treatment groups.

QOL and AEs

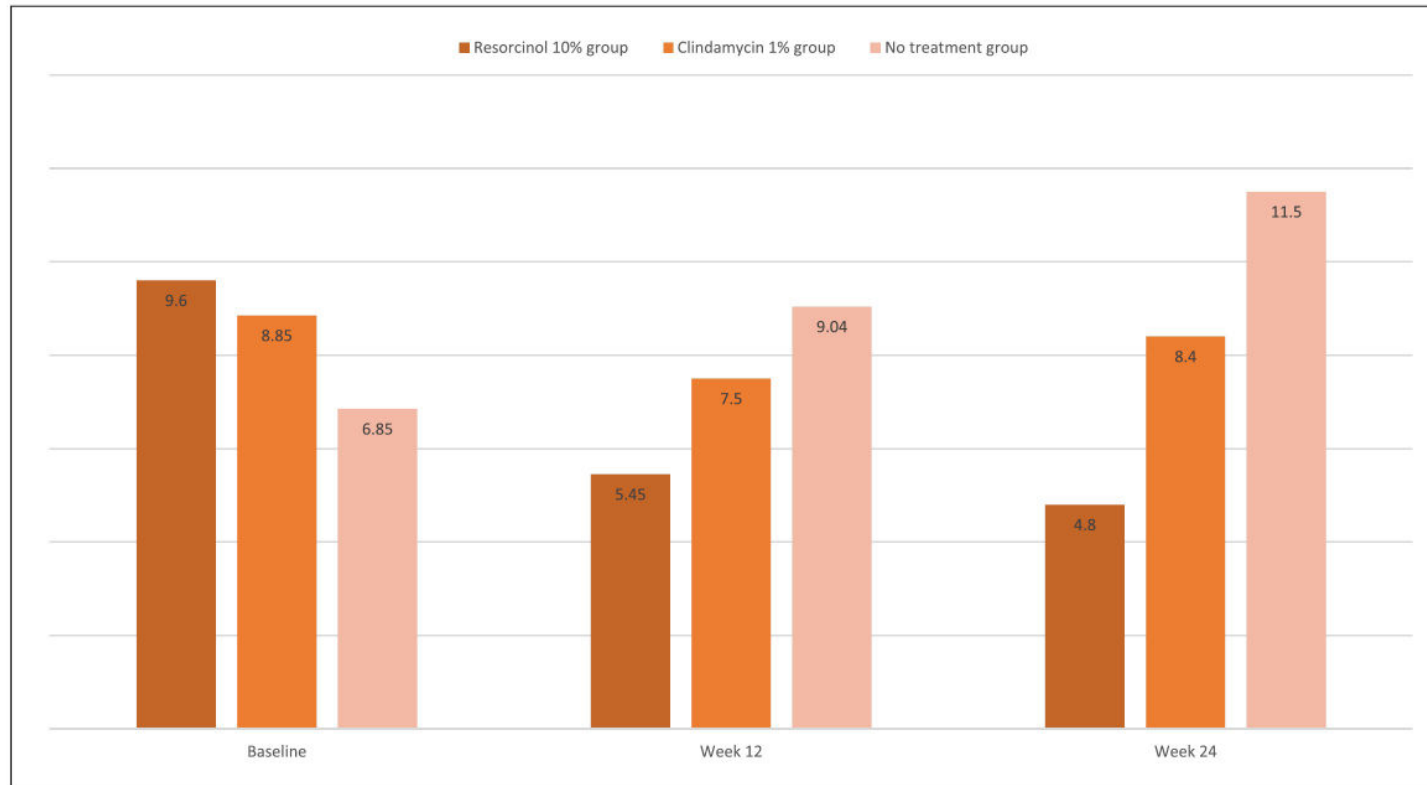
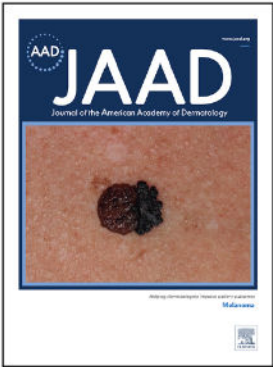


Fig. 3. Mean DLQI scores in the different treatment groups.

M/C resorcinol-associated AEs: desquamation, irritation, and reversible brown discoloration of the skin, in 37%, 25%, and 11% of the participants, respectively. (transient, reversible, and resolved spontaneously).

Zero discontinuation



Clascoterone in the Treatment of Mild Hidradenitis Suppurativa

Abby Hargis, BA, MS, Marita Yaghi, MD, Narges Maskan Bermudez, BS, Hadar Lev-Tov, MD, MAS

Table I: A Summary of Baseline Demographics and Clinical Outcomes of Patients with Mild Hidradenitis Suppurativa Treated with Topical Clascoterone 1% Cream

Summary Estimate	Age ^a	F sex ^b	Hurley Stage I _b	Hurley Stage 2 ^b	Years of Diagnosis ^c	Number of areas involved ^c	Negative Smoking history ^b	Concomitant Medications ^b	Time to evaluation in weeks ^{a, d}	Clinical improvement (Score 1 or 2) ^{b, e}
Included Patients (N=12)	28 (17-67)	11 (92%)	7 (58%)	5 (42%)	14.7 ± 16.1	2 ± 1.3	10 (83%)	<ul style="list-style-type: none">• Topical Clindamycin, 6 (50%)• Spironolactone, 5 (42%)• Doxycycline, 3 (25%)• Oral contraceptive pills, 1 (8%)• Adalimumab, 2 (17%)	10 (5-16)	10 (83%)

F: female
^a Unit: Median (range)
^b Unit: N (%) [note that the total percent in the “concomitant medications” column adds to over 100% because some patients (N=7) were on multiple medications]
^c Unit: Mean ± SD
^d time to follow-up from baseline initiation of clascoterone
^e Clinical Score Total: 0= no change in clinician or patient reported outcomes, +1=improvement in clinician reported outcomes, +1=improvement in patient reported outcomes, -1=deterioration in clinician reported outcomes, -1= deterioration in patient reported outcomes

Clascoterone BID x 10 weeks



Case

17 YO female

s/p 16 weeks of adalimumab
(40mg SC q weekly),
spironolactone 100mg daily,
clindamycin lotion (daily after
shower to AA)

Today, significant reduction in
drainage and erythema. Rarely
has new pubic, vaginal or buttock
nodules.





How will you manage this?



ANTI-INFLAMMATORY THERAPY

inflammation



Scarring tissue destruction

SURGERY

Deroofing

Deroofing

- Indication: tunneling wound
- Procedure: clean, local anesthetics, deroof, explore and remove all disease tissue, hemostasis, wound care
- Advantage: in office, compared to excision: faster, easier, faster recovery, potential remission
- Disadvantages: addresses one tunnel at a time*
- Billing: 11400s (EXCISION, BENIGN LESION INCLUDING MARGINS, EXCEPT SKIN TAG (UNLESS LISTED ELSEWHERE) e.g., 11406 = 3.5 wRVU)

Deroofing: A tissue-saving surgical technique for the treatment of mild to moderate hidradenitis suppurativa lesions

J Am Acad Dermatol
VOLUME 63, NUMBER 3

Hessel H. van der Zee, MD,^a Errol P. Prens, MD, PhD,^a and Jurr Boer, MD, PhD^b
Rotterdam and Deventer, The Netherlands

Table I. Patient characteristics

Patients, n = 44 (41 female, 3 male)	Median (interquartile range)
Age of disease onset, y	28 (20-37)
Age, y	35 (28-43)
Body mass index	26.8 (22.3-30.9)

Table II. Characteristics of treated lesions

Treated lesions	n = 88
Location of treated lesions	Axillae 44.3% Groin 46.6% Buttocks 9.1%
Size of defect directly postoperatively, cm	3.0 ± 1.7* (range 1-10)
Healing time, d	14.1 ± 7.8* (range 2-35)

*Mean ± SD.

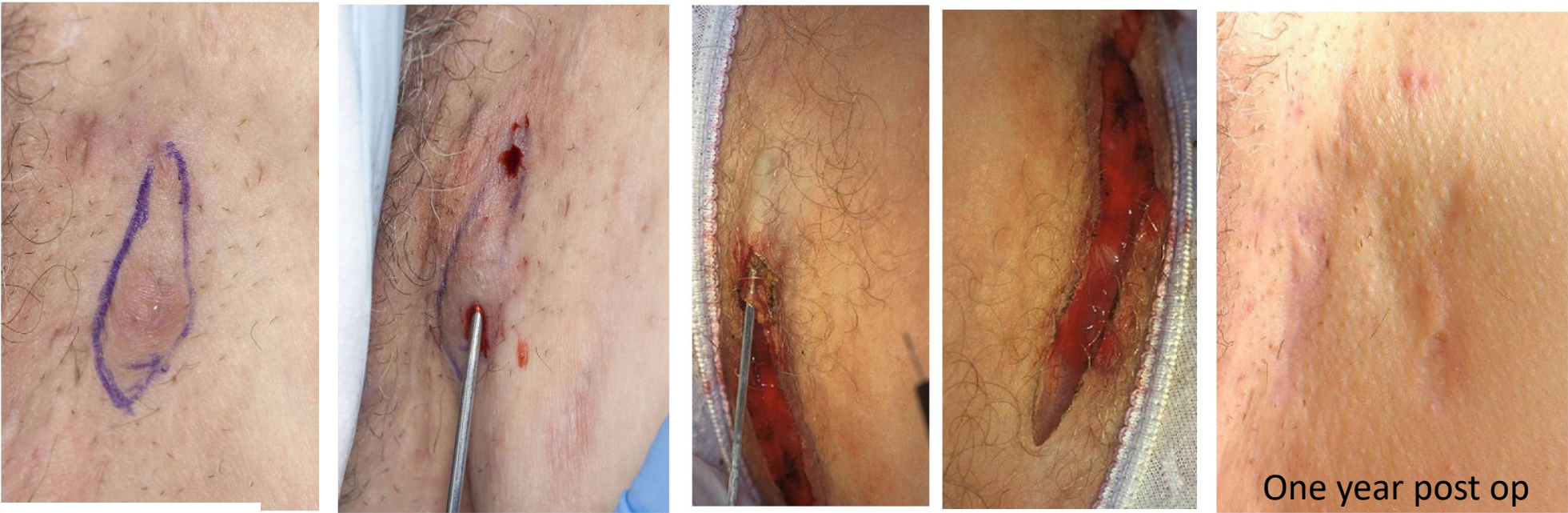


Table III. Patient satisfaction with deroofing procedure

	All patients n = 44	No recurrence n = 29	Recurrence n = 15
Satisfaction score (0-10)	8 (7-9)*	8 (7-9)*	7 (4-8)*
Score < 6	16%	8%	36%
Recommending deroofing to other patients	90%	92%	82%

*Median and interquartile range.

The mean healing time was 14 days. Fifteen of 88 (17%) deroofed lesions showed a recurrence, after a median of 4.6 months (interquartile range 1.2-6.2). In all, 73 deroofed lesions (83%) did not show a recurrence after a median follow-up of 34 months (interquartile range 24-44). One complication occurred in the form of postoperative bleeding. No infections were observed, nor was impairment of movement caused by postoperative scarring.

Patient Impressions and Outcomes After Clinic-Based Hidradenitis Suppurativa Surgery

Saranya Ravi, PhD; Jonathan A. Miles, MD, MPH; Chelsea Steele, MD, MPH; Mary Kate Christiansen, BS; Christopher J. Sayed, MD

Table 1. Patient, Clinical, and Surgery Characteristics by Patient-Reported Recurrence and Satisfaction

Characteristic	Surgical procedures, No. (%)			
	Total	Recurrence	Satisfaction with procedure	Satisfaction with outcome
No. (%)	194 (100)	79 (41)	169 (87)	166 (85)
Surgery type				
Deroofing	129 (66)	43 (33)	112 (87)	111 (86)
Local excision with closure	53 (27)	27 (51)	50 (94)	45 (85)
Local excision without closure	12 (6)	9 (75)	7 (58)	10 (83)

Recurrence after excision by repair type

Estimates of recurrence derived from poor data, still:

- SR of 79 studies. Mostly retrospective (one RCT, 7 prospective).
- 3055 lesion in 1780 patients, 87,178 lesion months of F/U (median 20 months)
- $595/3055 = \sim 20\%$ recurrence

The average estimated recurrence ([CI]):

Primary = 22.0% (8.0%–40.0%)

Secondary = 11.0% (5.0%–20.0%)

Skin graft = 2.0% (0.0%–5.0%)

Flap = 2.0% (1.0%–5.0%)

**Quality of evidence poor
Highly heterogeneous ($I^2 = 87\%$)**

STSG may not be the best closure option

Table 4. Univariate and Multivariate Analysis of Factors Associated with Disease Recurrence

Variable	Recurrence	No Recurrence	Univariate Analysis (P value)	Multivariate Analysis (P value)	Adjusted OR
History of smoking			0.009		
o Yes	21 (56.8%)	16 (43.2%)			
o No					
Number of lesions (mean)					2.08
Average lesion size (mean)					
Hurley stage:					
- 1					
- 2					
- 3					
Procedure:					
- Resection primary					
o Yes					
o No					
- Resection and split					4.22
o Yes					
o No					
- Resection secondary					
o Yes					
o No					
- Debridement					
o Yes					
o No					
- Abdominoplasty					
o Yes					
o No					
- Inner thigh lift					
o Yes					
o No					
- Flap advancement					
o Yes					
o No					
-Unroofing			1.000		
o Yes	0 (0%)	1 (100%)			
o No	32 (42.1%)	44 (57.9%)			
Postoperative antibiotics (systemic)			0.415		
o Yes	26 (52%)	24 (48%)			
o No	6 (40%)	9 (60%)			
Postoperative antibiotics (topical)			0.561		
o Yes	27 (50.9%)	26 (49.1%)			
o No	5 (41.7%)	7 (59.3%)			

Values in boldface indicate statistical significance at $P < 0.05$.

Greater number of lesions
and use of STSG
independently associated
with higher rates of disease
recurrence.



Initial



Post-Surgery



Week 4



Week 8



DOC, will secondary intention heal?

Secondary intent heals nicely



Post op



8 weeks



DOC, what if my patient has more than one tunnel?

Case presentation

- ❖ A 60-year old male presented with painful nodules, abscesses, and draining sinus tracts in the axillae of 40 years duration.
- ❖ A 16 year old female presented with similar, advanced, worsening HS of 1.5 years duration.



Case presentation

- ❖ Improvement followed oral clindamycin and rifampin, subsequently amplified by monthly infliximab infusions.
- ❖ However, lesions still recurred and substantial unremitting drainage resulted in significant morbidity.



Marsupialization performed:



Follow up

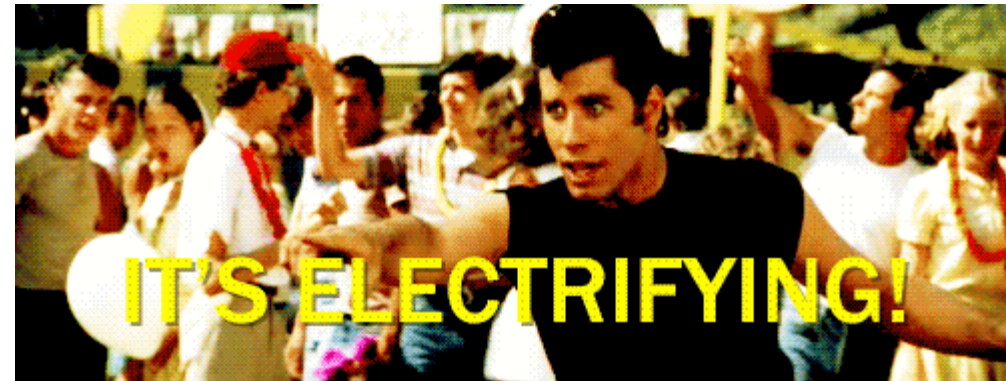




DOC, what else can I do to improve healing?

The Use of Bioelectric Wound Dressings

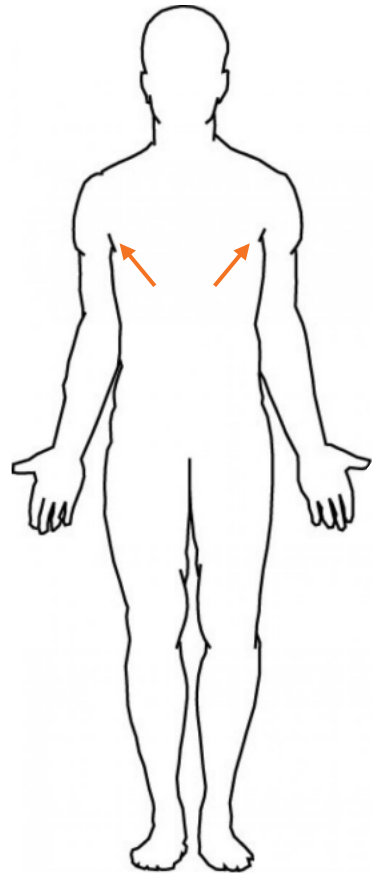
- Bio-electric wound dressings (BEWD):
- Electricidal antimicrobial efficacy
- Enhanced healing times through faster keratinocyte migration.
- Demonstrate an anti-inflammatory effect on wounds via a TNF- α and IL-1-dependent pathway



Hypothesis

BEWD will accelerate wound healing and reduce signs of inflammation in HS post axillary de-roofing procedure.

Study Design



Split-Body Design

B/L Axilla

Same-day
Deroofing

SOC vs. BEWD

N=12
Patients

Moderate-
to-severe HS

8 weeks FU



Results & Clinical Outcomes | Baseline Characteristics

Table 1. Participants Demographics

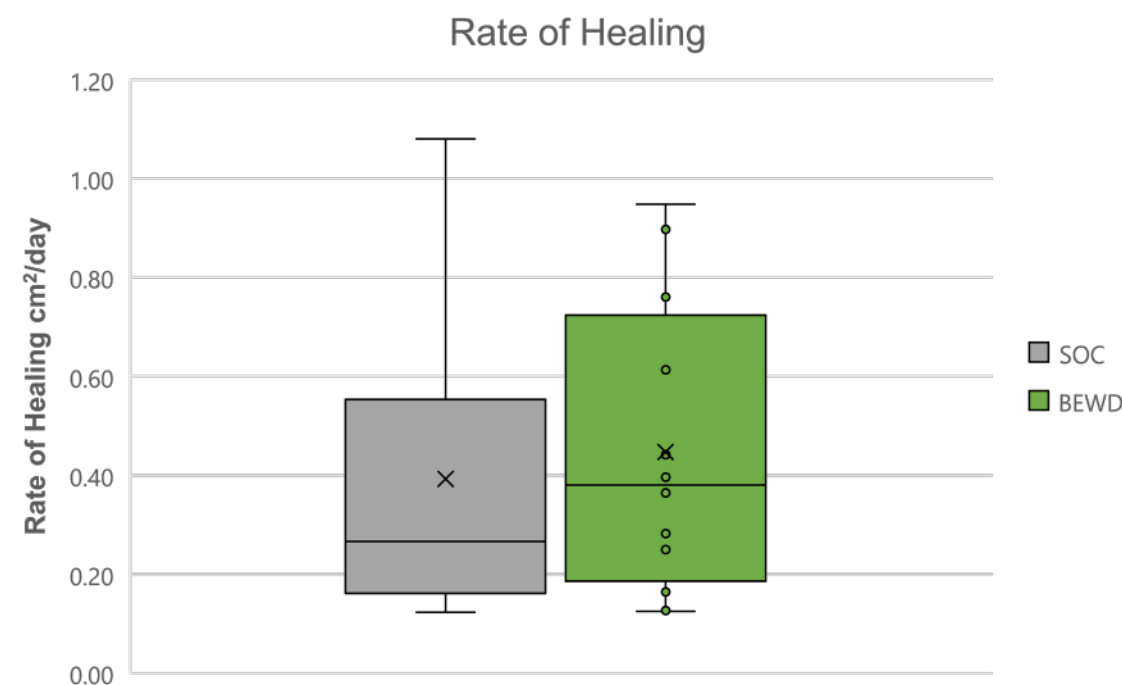
Characteristics		Value
Sex N (%)	Female	9 (75.0%)
	Male	3 (25.0%)
Race N (%)	White	9 (75.0%)
	Black	3 (25.0%)
Ethnicity N (%)	Non-Hispanic White	1 (8.3%)
	Hispanic	8 (66.7%)
Patient Age Median [Range]		31.5 [19-52]
Age at Diagnosis Median [Range]		25 [15-41]
Years of Diagnosis Median [Range]		4 [1-15]
Positive Family History N (%)		2 (16.7%)
Positive Smoking History N (%)		4 (33.3%)
BMI Category N (%)	Normal (18-24.9)	2 (16.7%)
	Overweight (25-29.9)	3 (25.0%)
	Class I Obese (30-34.9)	2 (16.7%)
	Class III Obese (> 40)	5 (41.7%)

Table 2. Clinical Data

Characteristics		Value	Characteristics		Value
Number of Anatomical Areas Involved N (%)	1	2 (16.7%)	Co-morbidities N (%)	Diabetes	3 (25.0%)
	2	2 (16.7%)		Hypertension	1 (8.3%)
	3	5 (41.7%)		Hyperlipidemia	0
	4	2 (16.7%)		IBD	0
Hurley Stage N (%)	2	6 (50.0%)		Anemia	1 (8.3%)
	3	6 (50.0%)		HIV	1 (8.3%)
HS-PGA Score N (%)	3	9 (75.0%)		Asthma	2 (16.7%)
	4	2 (16.7%)		Gynecologic Atopic Dermatitis	2 (16.7%)
	5	1 (8.3%)	Current Medications N (%)	Systemic antibiotics	4 (33.3%)
				Topical antibiotics	6 (50.0%)
				Antibacterial soap	3 (25.0%)
				Humira	4 (33.3%)
				OCPs	5 (41.7%)
				Spironolactone	7 (58.3%)

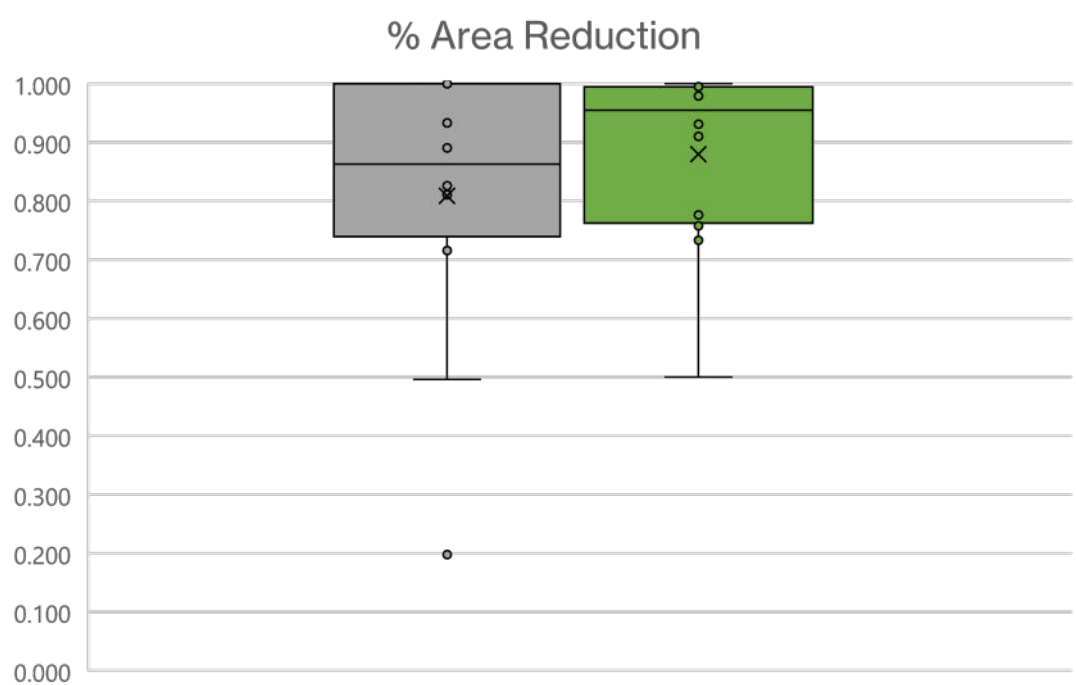
Results & Clinical Outcomes | Healing

Figure 1. Rate of Healing



BEWD: 0.45 ± 0.28 vs. SOC: 0.39 ± 0.28
p=0.893

Figure 2. Wound Area Reduction



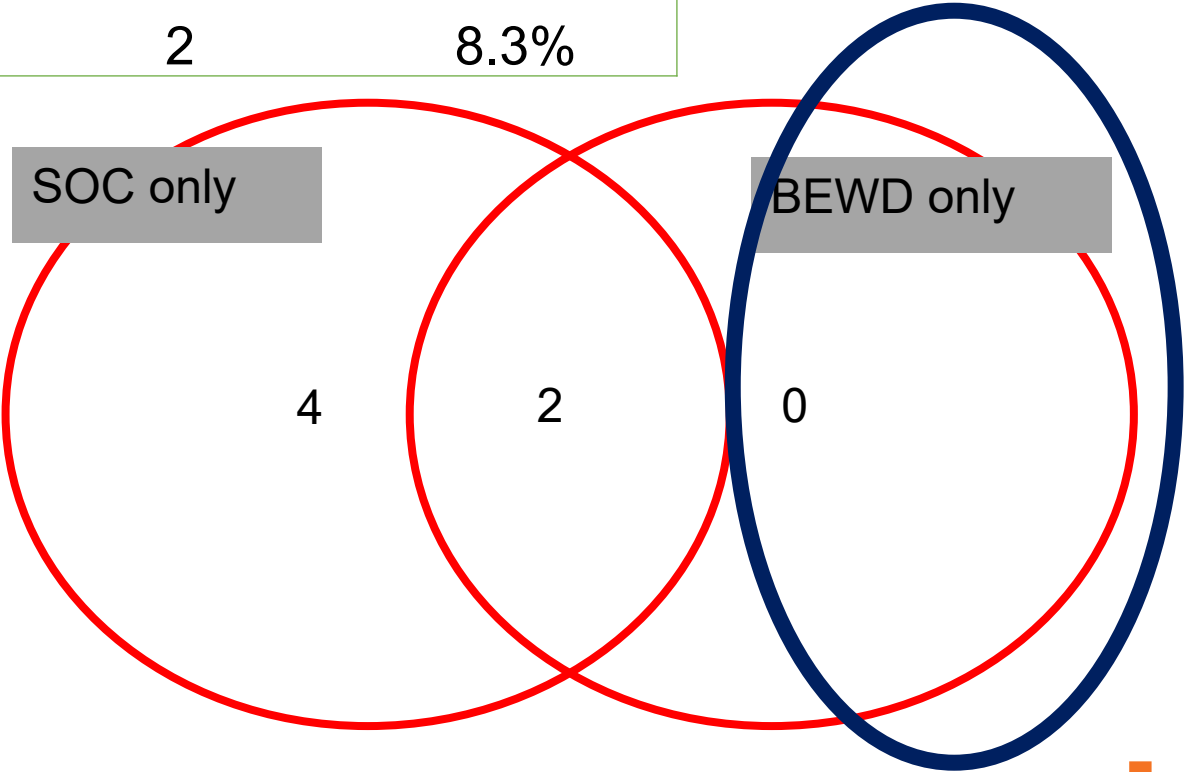
BEWD: $88.0\% \pm 15.7\%$ vs. SOC: $80.9\% \pm 24.3\%$
p=0.379

Faster rate of healing and % wound area reduction with BEWD

Results & Clinical Outcomes | Recurrence Rates

24 Sites

		Site Count	%
Recurrence	Yes	8	33.3%
	No	16	66.7%
Recurrence Site	SOC	6	25.0%
	BEWD	2	8.3%



What have we learned?

- HS diagnosis (TT&T, look at skin, be suspicious!)
- Topical options for mild HS (Clascoterone, resorcinol)
- Surgical options for tunnels (deroofing)
- Advanced wound care post-deroofing (bioelectric dressing)

