



*Original Contribution*

**HIGH REMISSION AND LOW RECURRENCE RATES OF HIDRADENITIS SUPPURATIVA LESIONS TREATED BY REGIONAL COMPLETE EXCISION AND SECONDARY INTENTION WOUND HEALING AFTER 36 MONTHS OF FOLLOW-UP**

**E. Hristakieva<sup>1,2</sup>, P. K. Kohl<sup>3,4</sup>, T. Gancheva<sup>1,2</sup>, K. Manuelyan<sup>1,2</sup>, R. Delijska<sup>1,2</sup>,  
D. Gancheva<sup>2</sup>, R. Lavcheva<sup>1,2\*</sup>**

<sup>1</sup>Department of Dermatology and Venereology, Faculty of Medicine, Trakia University, Stara Zagora, Bulgaria

<sup>2</sup>Clinic of Dermatology and Venereology, UMHAT “Prof. Dr Stoyan Kirkovich“, Stara Zagora, Bulgaria

<sup>3</sup>Department of Dermatology and Venereology, Vivantes Network for Health, Berlin, Germany

<sup>4</sup>Practice Hautärzte am Kurfürstendamm, Berlin, Germany

**ABSTRACT**

Hidradenitis suppurativa (HS) is a chronic inflammatory disease which mostly affects intertriginous skin areas. For its advanced stage, regional complete surgical excision (CSE), followed by healing by secondary intention is a useful treatment modality.

**PURPOSE:** We performed a pilot case series study to calculate remission and defined recurrence rates of HS lesions after regional CSE.

**METHODS:** 44 regional CSE were performed in 22 patients with Hurley stage II/III disease. The mean resulting wound size was 96 cm<sup>2</sup>. After completed reepithelization by secondary intention, patients were under regular face-to-face follow-up for 36 months at the Clinic of Dermatology and Venereology in Stara Zagora. New HS lesions within 1 cm around the resulting scar were rated as regional recurrence.

**RESULTS:** 42/44 (95.5%) excision sites showed complete scarring without hypertrophic scar, keloid formation, functional impairment or lymphedema. Regional recurrence was detected in 2/44 (4.5%) excision sites. New HS lesions distant from the regional excision site developed in 1/22 (4.5%) patients.

**CONCLUSIONS:** Our results underscore the high remission and low defined recurrence rates of treatment of advanced HS lesions by regional CSE and secondary intention wound healing and further support the significance of this treatment modality for long-term disease control.

**Key words:** acne inversa, maladie de Velpeau-Verneuil, disease control

**INTRODUCTION**

Hidradenitis suppurativa (HS) or acne inversa, historically termed Maladie de Velpeau-Verneuil, is a chronic and recurrent systemic inflammatory disease of hair follicles and sebaceous glands mostly in intertriginous skin areas presenting with painful pustules, abscesses, nodules, fistulas, sinus tracts and

scarring, ultimately leading to contractions and lymphedema (1). Because of its pathogenesis, the new term dissecting terminal hair folliculitis has been proposed (2).

Formerly HS seemed to be untreatable. So many different systemic and topical modalities for different disease stages have been described in the literature (3-10). Ideally, treatment for HS should provide high likelihood of cure, minimal inconvenience and loss of work time, improved quality of life and good cosmetic results.

**\*Correspondence to:** Dr. Rositsa Lavcheva, 2 General Stoletov Boul, UMHAT “Prof. Dr. Stoyan Kirkovich, Clinic of Dermatology and Venereology, Stara Zagora, Bulgaria, Phone: 00359884697917, e-mail: [rositsa.lavcheva@trakia-uni.bg](mailto:rositsa.lavcheva@trakia-uni.bg)

Today skin surgery is one of the cornerstones of treatment of HS (11-30). Superficial interventions like derroofing, Nd:YAG laser-treatment, cryotherapy, electro-surgery or photodynamic therapy can be useful for limited early cases of HS. But for advanced late cases, regional complete (earlier termed wide or radical) surgical excision of irreversibly destroyed tissue, including the surrounding subcutaneous fat with margins beyond the visible border of disease activity seems to represent a better therapeutic modality. Wound healing by secondary intention has been a long-established treatment method in dermatology (17). In the literature there is a wide range of recurrence rates (0 % - 54 %) after different surgical treatments of HS lesions and after different documented (18-30) follow-up periods (6 months - 10 years). There is a need for studies with a clear definition of recurrence of an HS lesion after therapy.

To calculate remission and defined recurrence rates of HS lesions following therapy we performed a pilot case series study of HS patients treated by regional complete excision followed by secondary intention wound healing who were under regular in-person clinical control at the Department of Dermatology and Venereology of the University Hospital "Prof. Dr. Stoyan Kirkovich" in Stara Zagora, Bulgaria.

Our study hypothesis was that defined HS lesion recurrence rate could be lower than most undefined HS lesion recurrence rates in the literature. The primary study objective was to observe the wound healing process for 36 months and the reappearance of HS lesion in the area of surgery. The secondary objectives were to define the term HS lesion remission and to calculate the recurrence rate for our treatment modality.

#### MATERIAL AND METHODS

Our analysis included 22 patients (11 women, 11 men) with Hurley stage II/III disease. Patients were hospitalized in the Department of Dermatology and Venereology of University Hospital "Prof. Dr. Stoyan Kirkovich" in Stara Zagora. As part of the hospitalization, informed consent was signed and all ethical protocols were followed. 14/22 patients were classified by BMI as overweight or obese. Preoperative treatment included topical chlorhexidine

gluconate and systemic clindamycin (2 x 300 mg) and rifampicin (1 x 600 mg) for 10 weeks. No other medical therapies, including biological treatments, were interrupted or withheld for surgery. Altogether 44 regional complete excisions (19 excisions in both axillae, 19 excisions in the inguino-genito-anal region, 6 excisions in the gluteal region) were performed under local or tumescent local anesthesia in the time period between 2012 to 2017. Irreversibly destroyed tissue like indurated skin and fistulas were surgically removed carefully by following fistulas and sinus tracts down to the deep subcutaneous tissue which left clean wounds for secondary healing. The mean resulting wound size for all regional wounds was 96 cm<sup>2</sup> (range 52 cm<sup>2</sup> - 185 cm<sup>2</sup>). As no wound closure with grafts or flaps was planned the safety margin could be generous, at least 1 cm, depending on the anatomical area. Secondary intention wound healing included topical treatment with octenidine dihydrochloride solution, dressings with calcium alginate and systemic treatment with zinc gluconate and analgesics. Physiotherapy, nutritional and psychological guidance were a regular part of treatment (31). After completed reepithelization of surgical wounds patients were under in-person regular clinical control (monthly for three months, thereafter quarterly) for a standard time period of 36 months. If a new HS lesion appeared within 1 cm around the resulting scar it was rated as regional recurrence.

#### RESULTS

Postoperative bleeding occurred after 2/44 (4,5%) excisions. The mean duration for complete epithelization was 8 weeks (range 6 weeks – 24 weeks). At standard follow-up time of 36 months 42/44 (95.5 %) excision sites showed complete scarring without hypertrophic scar, keloid formation, functional impairment or lymphedema (**Figures 1-4**). Defined regional recurrence, into the operated area, was detected in 2/44 (4.5%) excision sites in 2 female patients in the ano-genital area. One recurrence occurred after 15 months, the other recurrence 36 months after reepithelization of surgical wounds. New HS lesions distant from the regional excision site, as sign of natural systemic disease, developed in one male patient (1/22, 4.5%).



**Figure 1.** Right axilla of 24 years old female patient with HS before regional complete excision



**Figure 2.** Right axilla of 24 years old female patient with HS 20 months after regional complete excision and secondary intention wound healing



**Figure 3.** Genitoanal area of 32 years old male patient with HS before regional complete excision



**Figure 4.** Genitoanal area of 32 years old male patient with HS 6 months after regional complete excision and secondary intention wound healing

## DISCUSSION

Defined recurrence after surgery should be considered as new HS lesion into the excised area or  $\leq 1$  sm near the border of excision (32). Both of our recurrences occurred into the operated area in the ano-genital region of two female patients demonstrating that complete excision is sometimes not sufficient enough in this anatomical region, supporting that location of HS may play a factor for recurrence (26, 28). In earlier studies in the literature regional excisions followed by secondary intention healing showed undefined recurrence rates of 11 % - 38 % (21,23,26,28). Our low recurrence rate may be affected by the relatively small number of excised HS lesions. However, we are continuously expanding the number of patients.

## CONCLUSION

In our analysis dermato-surgical treatment of HS by regional complete excision followed by secondary intention wound healing provided high likelihood of definitive long-term cure of lesions, good cosmetic results and improved quality of live for our patients. These factors will lead on the long run to the reduction of work impairment because of HS (33).

On the other hand, inconvenience and loss of work time during secondary intention wound healing must be faced by proper treatment planning and careful information of the patient. Also, therapeutic modalities like combination with biological therapies and negative pressure wound therapy could reduce loss of work time in the future.

Our high remission and low defined recurrence rates after regional complete excision and

secondary intention wound healing further support the significance of this treatment modality for long-term disease control.

## REFERENCES

1. Hristakieva, E., Manuelyan, K., Gancheva, T., Lavcheva, R., Deliyska, R., Hidradenitis suppurativa from the typical patient to the new clinical phenotypes. *Clin Dermatol*, 41:584-591, 2023.
2. Chen, W., Plewig G. Should hidradenitis suppurativa/acne inversa best be renamed as "dissecting terminal hair folliculitis"?. *Exp Dermatol*, 26(6):544-547. 2017.
3. Wyant, W. A., Manjaly, P., Orłowski, G. M., Hidradenitis suppurativa: a new, principle-centered paradigm for managing a dynamic disease. *Int J Dermatol*. 2024 Mar 1. doi: 10.1111/ijd.17105. Epub ahead of print. PMID: 38425315.
4. Salame, N., Sow YN, Siira, MR., et al. Factors affecting treatment selection among patients with hidradenitis suppurativa. *JAMA Dermatol*. 2024;160(2):179-186. doi:10.1001/jamadermatol.2023.5425.
5. Molinelli, E., De Simoni, E., Candelora, M., et al. Systemic antibiotic therapy in hidradenitis suppurativa: A Review on treatment landscape and current issues. *Antibiotics (Basel)*. 12(6):978, 2023.
6. Aarts, P., van Huijstee, J. C., van der Ze, H. H., van Straalen K. R., Prens, E. P. Improved clinical effectiveness of adalimumab when initiated with clindamycin and rifampicin in hidradenitis suppurativa. *J Eur Acad Dermatol*

- Venereol.* Published online December 19, 2023. doi:10.1111/jdv.19725.
7. Orenstein, L. A. V., Nguyen, T. V., Damiani, G., Sayed, C., Jemec, G. B. E., Hamzavi, I. Medical and surgical management of hidradenitis suppurativa: a review of international treatment guidelines and implementation in general dermatology practice. *Dermatology*, 236:393-412, 2020.
  8. Zouboulis, C. C., Bechara, F. G., Dickinson-Blok, J. L., Gulliver, W., Horváth, B., Hughes, R., Kimball, A.B., Kirby, B., Martorell, A., Podda, M., Prens, E. P., Ring, H.C., Tzellos, T., van der Zee, H.H., van Straalen, K.R., Vossen, A. R. J. V., Jemec, G. B. E. Hidradenitis suppurativa/acne inversa: a practical framework for treatment optimization - systematic review and recommendations from the HS ALLIANCE working group. *J Eur Acad Dermatol Venereol*, 33:19-31, 2019.
  9. Alikhan, A., Sayed, C., Alavi, A., et al. North American clinical management guidelines for hidradenitis suppurativa: A publication from the United States and Canadian Hidradenitis Suppurativa Foundations: Part II: Topical, intralesional, and systemic medical management. *J Am Acad Dermatol*, 81(1):91-101, 2019. doi:10.1016/j.jaad.2019.02.068
  10. Gulliver, W., Zouboulis, C. C., Prens, E., Jemec, G.B., Tzellos, T. Evidence-based approach to the treatment of hidradenitis suppurativa/acne inversa, based on the European guidelines for hidradenitis suppurativa. *Rev Endocr Metab Disord*, 17(3):343-351, 2016.
  11. Bui, H., Bechara, F.G., George, R., et al. Surgical procedural definitions for hidradenitis suppurativa developed by expert delphi consensus. *JAMA Dermatol*, 159(4):441-447, 2023.
  12. Shukla, R., Karagaiah, P., Patil, A., et al. Surgical treatment in hidradenitis suppurativa. *J Clin Med*. 2022;11(9):2311 Published 2022 Apr 21. doi:10.3390/jcm11092311
  13. Chawla, S., Toale, C., Morris, M., Tobin, A. M., Kavanagh, D. Surgical management of hidradenitis suppurativa: a narrative review. *J Clin Aesthet Dermatol*, 15(1):35-41, 2022.
  14. Wollina, U., Brzezinski, P., Koch, A., Philipp-Dormston, W. G. Immunomodulatory drugs alone and adjuvant to surgery for hidradenitis suppurativa/acne inversa a narrative review. *Dermatol Ther*. 2020;33(6):e13877. doi:10.1111/dth.13877
  15. Manfredini, M., Garbarino, F., Bigi, L., Pellacani, G., Magnoni, C. Hidradenitis suppurativa: surgical and postsurgical management. *Skin Appendage Disord*, 6(4):195-201, 2020.
  16. Wollina, U., Langner, D., Heinig, B., Nowak, A. Comorbidities, treatment and outcome in severe anogenital inverse acne (hidradenitis suppurativa): a 15-year single center report. *Int J Dermatol*, 56:109-115, 2017.
  17. Gasslitter, I., Häfner, H. M., Kofler, K., Kofler, L. Postoperative Wundversorgung mit individuell angefertigten Wundauflagen bei Hidradenitis suppurativa: Wundversorgung nach radikaler Exzision mit sekundärem Wundverschluss [Postoperative wound care with custom-made wound dressings for hidradenitis suppurativa: Wound care after radical excision with secondary wound closure] [published correction appears in *Dermatologie (Heidelb)*. 2024 Jan 8;:]. *Dermatologie (Heidelb)*. 2022;74(12):994-996. doi:10.1007/s00105-023-05247-x
  18. Gierek, M., Bergler-Czop, B., Łabuś, W., Ochała-Gierek, G., Niemiec, P. Reconstructive surgical treatment of hidradenitis suppurativa with a 6-month follow-up. *Postepy Dermatol Alergol*. 40(2):268-272, 2023.
  19. Vaillant, C., Berkane, Y., Lupon, E., et al. Outcomes and reliability of perforator flaps in the reconstruction of hidradenitis suppurativa defects: a systemic review and meta-analysis. *J Clin Med*. 2022;11(19):5813, Published 2022 Sep 30. doi:10.3390/jcm11195813
  20. Janek, K. C., Kenfield, M., Arkin, L. M., et al. Outcomes and cost of medical and surgical treatments of pilonidal disease: a single institution's 10-year review. *Surg Open Sci*, 9:41-45. 2022.
  21. Ovadja, Z. N., Zugaj, M., Jacobs, W., van der Horst, C. M. A. M., Lapid, O. Recurrence rates following reconstruction strategies after wide excision of hidradenitis suppurativa: a systematic review and meta-analysis. *Dermatol Surg*. 2021;47(4):e106-e110. doi:10.1097/DSS.0000000000002815.

22. Riddle, A., Westerkam, L., Feltner, C., Sayed, C. Current surgical management of hidradenitis suppurativa: a systematic review and meta-analysis. *Dermatol Surg*, 47(3):349-354, 2021.
23. Ovadja, Z. N., Jacobs, W., Zugaj, M., van der Horst, C. M. A. M., Lapid, O. Recurrence rates following excision of hidradenitis suppurativa: A systematic review and meta-analysis. *Dermatol Surg* 2020; 46:e1-e7. doi: 10.1097/DSS.0000000000002403.
24. Saylor, D. K., Brownstone, N.D., Naik, H. B. Office-based surgical intervention for hidradenitis suppurativa (HS): a focused review for dermatologists. *Dermatol Ther (Heidelb)*, 10(4):529-549, 2020.
25. Bouazzi, D., Chafanska, L., Saunte, D. M. L., Jemec, G. B. E. Systematic review of complications and recurrences after surgical interventions in hidradenitis suppurativa. *Dermatol Surg*, 46:914-921, 2020.
26. Ngaage, L. M., Wu, Y., Ge S, Gebran, S., Liang, F., Rada, E. M., Nam, A. J., Silverman, R. P., Rasko, Y. M. Factors influencing the local cure rate of hidradenitis suppurativa following wide local excision. *Int Wound J*, 17:117-123, 2020.
27. Shavit, E., Pawliwec, A., Alavi, A., George, R. The surgeon's perspective: a retrospective study of wide local excisions taken to healthy subcutaneous fat in the management of advanced hidradenitis suppurativa. *Can J Surg*. 2020;63(2):E94-E99. Published 2020 Feb 28. doi:10.1503/cjs.003119
28. Deckers, I. E., Dahi, Y., van der Zee H. H., Prens, E. P. Hidradenitis suppurativa treated with wide excision and second intention healing: a meaningful local cure rate after 253 procedures. *J Eur Acad Dermatol Venereol*, 32(3):459-462. 2018.
29. Walter, A. C., Meissner, M., Kaufmann, R., Valesky, E., Pinter, A., Hidradenitis suppurativa after radical surgery - longterm follow-up for recurrences and associated factors. *Dermatol Surg*, 44:1323-1331, 2018.
30. Humphries, L. S., Kueberuwa, E., Beederman, M., Gottlieb, L. J. Wide excision and healing by secondary intent for the surgical treatment of hidradenitis suppurativa: A single-center experience. *J Plast Reconstr Aesthet Surg*, 69(4):554-566, 2016.
31. Paskaleva, R., Hristakieva, E., Lavcheva, R. Rehabilitation program for surgery of hidradenitis suppurativa. Fundamental and applied studies in EU and CIS Countries, VII. *International Academic Congress, papers and commentaries, Cambridge University Press* 8:120-127, 2017.
32. Walter, A. C., Markus M., Kaufmann, R., Valesky, E. Pinter, A. Hidradenitis suppurativa after radical surgery - long-term follow-up for recurrences and associated factors. *Dermatologic Surgery* 44(10): p 1323-1331, October 2018. | DOI: 10.1097/DSS.0000000000001668
33. Schneider-Burrus, S., Kalus, S., Fritz, B., Wolk, K., Gomis-Kleindienst, S., Sabat, R. The impact of hidradenitis suppurativa on professional life. *Br J Dermatol*, 188(1):122-130, 2023.