



Retrospective Analysis of Electrocautery Procedures in the Dermatology Outpatient Clinic of Bali Mandara Hospital Based on Medical Record Data

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Abstract

Electrocautery is a minor surgical procedure that uses electrical energy to generate heat for tissue destruction and hemostasis. This procedure is commonly used in the Dermatology Outpatient Clinic of Bali Mandara Hospital for the management of Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis. This study aimed to analyze the pattern and management of electrocautery procedures for these dermatological cases based on medical record data from 2022 to 2025. This study used a retrospective descriptive design based on secondary data obtained from the medical records of patients who underwent electrocautery procedures at the Dermatology Outpatient Clinic of Bali Mandara Hospital. Data were analyzed using descriptive statistics, cross-tabulation, and annual case growth analysis with Microsoft Excel and SPSS version 27. The results showed a total of 322 cases, consisting of 78 cases of Condyloma Acuminata (24.22%), 138 cases of Verruca Vulgaris (42.86%), and 106 cases of Seborrheic Keratosis (32.92%). Verruca Vulgaris was the most frequently treated condition during the study period. The findings also indicate that each condition requires different electrocautery techniques according to lesion characteristics, anatomical location, and clinical considerations. Electrocautery is a suitable procedure for the management of Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis at Bali Mandara Hospital. However, the technique should be adjusted to the characteristics of each case to optimize treatment outcomes and ensure patient safety.

Introduction

Cauterization derives from the Latin word cauter, meaning coagulation (Abbas & Watters, 2026; Chakraborty et al., 2026; Siregar & Hamdani, 2026). The cauterization method initially used metal heated by fire or other chemicals to burn tissue, thereby stopping bleeding. The cauterization method continued to be used until changes occurred in the early 20th century. William T. Bovie began utilizing electricity to generate heat. Bovie's discovery subsequently influenced surgical technology.

Electrocautery methods have continued to be developed for various functions in modern medicine (Lian et al., 2025; Sansanwal et al., 2026; Sang et al., 2026). Hemostasis (stopping bleeding) by coagulating blood in small blood vessels during surgery to prevent excessive blood loss, keep the wound cleaner, and accelerate healing. Tissue ablation burning and removing abnormal tissue such as warts, moles, skin tags, milia, or benign tumors often with minimal scarring. Minor surgeries such as skin procedures, circumcision (laser circumcision), or the removal of lesions requiring high precision (SNIGDHA et al., 2025; Kalyenci et al., 2025; Meghe et al., 2024). Electrodesiccation, which involves drying out tissue, for example,

to treat sebaceous hyperplasia or pyogenic granuloma. Skin aesthetics, which involves evening out skin tone by removing dark spots, acne scars, or improving skin texture. This method is also used in dentistry to control gum bleeding or to precisely cut soft oral tissues (Rahayu et al., 2025; Halodoc Editorial Team, 2026).

The electrocautery method has various advantages, making it a widely used method in modern medicine (Naveed et al., 2026; Kasgriah et al., 2026; Kamilah et al., 2025). The electrocautery device is a versatile tool in modern surgery, offering efficiency and safety in various surgical and cosmetic procedures. Its high precision allows doctors to work accurately on target tissues. It minimizes bleeding, thereby reducing blood loss and the need for sutures. The risk of infection is low because the heat generated can kill bacteria. Healing time is relatively fast because the wound heals more cleanly (Armini et al., 2024; Salma et al., 2025).

The success rate of electrocautery in modern medicine is very high, particularly for removing benign skin conditions such as warts, moles, or skin tags; often, only a single treatment session is needed to achieve permanent results. It is also effective at controlling bleeding during surgery with minimal risk of side effects when performed by a professional. This procedure is safe and efficient because it utilizes heat from electrical energy to precisely destroy abnormal tissue, accelerate healing, and minimize scarring, although it requires a brief recovery period (Havill, 2023; Kalyenci et al., 2025).

The cauterization procedure carries several risks; one of the primary risks is infection in the treated area, and patients may also experience burns due to the heat generated during the procedure. Electrocautery procedures typically do not leave scars when performed correctly. However, patients often experience significant pain during and after the procedure, with a recovery period ranging from a few days to one week, depending on the location and size of the treated tissue (Mawardi et al., 2023; Mazzoni & Muir, 2021).

The electrocautery procedure is one of the procedures frequently used in the management of dermatological cases at Bali Mandara Hospital. The dermatological conditions treated with this procedure include Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis. Patient data for those who underwent this procedure from 2022 to 2025 are as follows.

Table 1. Frequency Distribution Analysis of Respondent Characteristics

Year	Condyloma Acuminata	Common Warts	Seborrheic Keratosis
2022	4	9	4
2023	10	30	28
2024	33	44	44
2025	31	55	30
Total	78	138	106

Source: Bali Mandara Hospital, 2026

The data in Table 1 show fluctuating conditions each year and the number of cases. The data for the three types of diseases show both increases and decreases each year. When analyzed, these fluctuations can provide insight into a pattern that is useful for the management of patients undergoing electrocautery procedures. This phenomenon can be studied using a retrospective descriptive method.

Methods

This study used a retrospective descriptive design based on secondary medical record data from the Dermatology Outpatient Clinic of Bali Mandara Hospital. The study analyzed patients who underwent electrocautery procedures for three dermatological conditions, namely Condyloma

Acuminata, Verruca Vulgaris/Common Warts, and Seborrhic Keratosis, during the period 2022–2025.

The population of this study consisted of all patients recorded as receiving electrocautery treatment at the Dermatology Outpatient Clinic of Bali Mandara Hospital within the study period. The sample included all eligible medical record data that met the inclusion criteria, namely patients diagnosed with Condyloma Acuminata, Verruca Vulgaris/Common Warts, or Seborrhic Keratosis and treated using electrocautery between 2022 and 2025. Medical records with incomplete information regarding diagnosis, year of treatment, or type of procedure were excluded from the analysis.

The main variables analyzed in this study were the year of treatment and type of dermatological case. The case categories included Condyloma Acuminata, Verruca Vulgaris/Common Warts, and Seborrhic Keratosis. The total number of cases, percentage distribution, and annual growth of each case category were calculated to identify the pattern and trend of electrocautery use during the study period.

Data were collected through documentation review of hospital medical records. The data were then tabulated using Microsoft Excel and analyzed using SPSS version 27. Descriptive statistical analysis was performed to determine the frequency and percentage distribution of each dermatological condition. Cross-tabulation analysis was used to describe the distribution of cases by year and diagnosis. In addition, annual growth was calculated to examine changes in the number of cases from year to year using the following formula:

$$\text{Growth (\%)} = \frac{(\text{Number of cases in the current year} - \text{Number of cases in the previous year})}{\text{Number of cases in the previous year}} \times 100$$

The findings from the retrospective descriptive analysis were further interpreted using relevant literature to explain the clinical characteristics of each condition and the differences in electrocautery management. This literature-based discussion was used to support the interpretation of the quantitative findings, particularly regarding disease characteristics, treatment considerations, healing time, recurrence risk, and clinical implications of electrocautery use.

Result and Discussion

Quantitative analysis was conducted using SPSS Version 27 to generate a cross-tabulation. The cross-tabulation will show the prevalence of Condyloma Acuminata, Verruca Vulgaris, and Seborrhic Keratosis from 2022 to 2025.

Table 2. Cross-Tabulation Analysis

Year * Case Crosstabulation						
			Cases			Total
			Condyloma Acuminata	Common Warts	Seborrhic Keratosis	
Year	2022	Count	4	9	4	17
		% within the Year	23.53%	52.94%	23.53%	100.00%
		% within Cases	5.13%	6.52%	3.77%	5.28%
		% of Total	1.24%	2.80%	1.24%	5.28%
	2023	Count	10	30	28	68
		% within the Year	14.71%	44.12%	41.18%	100.00%

		% within Cases	12.82%	21.74%	26.42%	21.12%
		% of Total	3.11%	9.32%	8.70%	21.12%
	2024	Count	33	44	44	121
		% within the Year	27.27%	36.36%	36.36%	100.00%
		% of cases	42.31%	31.88%	41.51%	37.58%
		% of Total	10.25%	13.66%	13.66%	37.58%
	2025	Count	31	55	30	116
		% within the Year	26.72%	47.41%	25.86%	100.00%
		% within Cases	39.74%	39.86%	28.30%	36.02%
		% of Total	9.63%	17.08%	9.32%	36.02%
Total	Count	78	138	106	322	
	% within the Year	24.22%	42.86%	32.92%	100.00%	
	% within Cases	100.00%	100.00%	100.00%	100.00%	
	% of Total	24.22%	42.86%	32.92%	100.00%	

Source: processed data, 2026

The data in Table 2 shows that the total number of cases of Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis from 2022 to 2025 was 322 cases. Condyloma acuminata accounted for 24.22%, common warts for 42.86%, and seborrheic keratosis for 32.92%. This data indicates that common warts were the dominant condition compared to the others. The highest number of Condyloma Acuminata cases occurred in 2024, totaling 33 cases or 42.31% of all Condyloma Acuminata cases. The highest number of Common Warts cases occurred in 2025, totaling 55 cases or 39.86% of all Common Warts cases. The highest number of cases of Seborrheic Keratosis occurred in 2025, with 44 cases, or 41.51% of all Seborrheic Keratosis cases.

Quantitative analysis was also used to determine the growth in cases of Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis from 2022 to 2025. This growth data is necessary to identify specific growth trends for these three types of diseases. These findings are retrospective and can serve as a basis for qualitative analysis.

Table 3. Case Growth Data

Year	Genital Warts		Common Warts		Seborrheic Keratosis	
	Total	Growth (%)	Total	Growth (%)	Number	Growth (%)
2022	4		9		4	
2023	10	150.00	30	233.33	28	600.00
2024	33	230.00	44	46.67	44	57.14
2025	31	-6.06	55	25.00	30	-31.82

Source: processed data, 2026

The data in Table 3 show that Verruca Vulgaris has shown an upward trend from 2022 to 2025. Cases of Condyloma Acuminata and Seborrheic Keratosis exhibit a similar growth pattern.

Common warts, genital warts, and seborrheic keratosis are three dermatological conditions with distinct etiologies and pathogenesis, thus requiring different destructive treatment approaches, including the use of electrocautery. Common warts and genital warts are both caused by Human Papillomavirus (HPV) infection, but involve different viral types and anatomical locations (, whereas seborrheic keratosis is a non-infectious benign epidermal tumor associated with age and genetic factors (Al Rudaisat & Cheng, 2021; Dayeh et al., 2026; Zhu et al., 2022).

Verruca vulgaris is primarily caused by HPV types 2 and 4, which infect the epidermis through skin microabrasions. This infection induces keratinocyte proliferation, resulting in the formation of characteristic hyperkeratotic lesions. Transmission can occur through direct contact or autoinoculation, resulting in high prevalence among children and young adults (Dayeh et al., 2026; Zhu et al., 2022). In contrast, Condyloma Acuminata is caused by HPV types 6 and 11, which infect the anogenital mucosa, with transmission primarily occurring through sexual contact. The lesions are softer, multiple, and vascular [6]. Seborrheic keratosis is not an infectious disease but rather a clonal proliferation of keratinocytes associated with genetic mutations such as FGFR3 and PIK3CA, as well as age-related factors [8,9].

The predominance of common warts during the 2022–2025 period at Bali Mandara Hospital can be explained by several factors. First, the high rate of transmission through direct contact and autoinoculation causes cases to spread easily in the general population. Second, common wart lesions are often persistent and unresponsive to topical therapies such as salicylic acid, prompting patients to seek destructive procedures. Destructive therapies such as electrocautery or cryotherapy are often chosen for cases refractory to conservative therapy (Dayeh et al., 2026; Zhu et al., 2022). Additionally, the electrocautery approach is relatively easy to implement, provides rapid results, and can be performed in a single visit, making it a practical choice in healthcare facilities.

Differences in the implementation of electrocautery for these three conditions are closely related to the characteristics of the lesions and the tissues involved (Hajilo et al., 2025; Nadagouda et al., 2026; Guerrini et al., 2026). In Verruca Vulgaris, electrocautery is performed with the aim of destroying the HPV-infected epidermal tissue down to the superficial dermis. The energy used is relatively higher because the lesions are hyperkeratotic. This technique aims to eliminate the local viral reservoir, thereby reducing the risk of lesion persistence (Al Rudaisat & Cheng, 2021; Dayeh et al., 2026; Zhu et al., 2022).

In Condyloma Acuminata, electrocautery is applied more superficially because the lesions are located on sensitive and more vascular mucosal tissue. The primary goal of therapy is the elimination of clinical lesions and the reduction of transmission risk, not total viral eradication, given that HPV can persist subclinically. Destructive modalities, including electrocautery, are effective for removing large or multiple lesions, but must be combined with sexual education and, in some cases, additional topical therapy (Workowski et al., 2021).

In seborrheic keratosis, electrocautery is typically used as a superficial ablation therapy, often combined with curettage. Because the lesions are benign and non-infectious, the depth of destruction is relatively minimal and is primarily intended for cosmetic or diagnostic reasons. Simple destructive therapies yield good results with a low risk of complications in seborrheic keratosis (Ammad et al., 2023; Barthelmann et al., 2023).

These differences in characteristics have clinical implications for patient (Nolin-Lapalme et al., 2026; Muscoli et al., 2026; Miyazaki et al., 2026). In common warts, post-procedure pain may occur, particularly in plantar locations due to mechanical pressure while walking, with a healing time ranging from 7–14 days. The risk of scarring is higher in certain locations, but is generally clinically acceptable (Al Rudaisat & Cheng, 2021). In Condyloma Acuminata, post-procedure pain tends to be more significant due to the sensitive mucosal location, with a healing

time of approximately 10–21 days. The risk of secondary infection and temporary sexual dysfunction is also higher (Workowski et al., 2021). In Seborrheic Keratosis, the impact on the patient is relatively minimal, with mild erythema and a healing time of about 5–7 days (Ammad et al., 2023; Barthelmann et al., 2023).

In terms of treatment duration and recurrence, there are significant differences among the three conditions (Zu et al., 2026; Spiera et al., 2023). Common warts generally require one to two electrocautery sessions with a recurrence rate of approximately 20–30%, influenced by the patient's immune status and the possibility of autoinoculation (Dayeh et al., 2026; Zhu et al., 2022). Condyloma acuminata often requires two to three treatment sessions with a higher recurrence rate, ranging from 30–60%, because HPV can persist in subclinical tissue even after clinical lesions have been removed (Fu et al., 2025; Workowski et al., 2021). In contrast, Seborrheic Keratosis rarely recurs after a single treatment, with reported recurrence rates of less than 5%, as it is not an infectious disease and does not involve viral factors (Ammad et al., 2023; Barthelmann et al., 2023).

Based on this comparison, the application of electrocautery should be tailored to the characteristics of each condition. For Common Warts, electrocautery is recommended for single lesions or those refractory to topical therapy, with destruction down to the base of the papilla to reduce the viral reservoir. For Condyloma Acuminata, electrocautery is more appropriate for large or multiple lesions unresponsive to topical therapy, using a superficial technique to minimize the risk of scarring and accompanied by education on preventing transmission. For Seborrheic Keratosis, electrocautery can be applied as a mild ablation procedure, particularly for cosmetic or diagnostic indications, using low energy and combined with curettage if necessary.

Conclusion

Electrocautery procedures were used in the management of three main dermatological conditions at the Dermatology Outpatient Clinic of Bali Mandara Hospital during the 2022–2025 period, namely Condyloma Acuminata, Verruca Vulgaris, and Seborrheic Keratosis. Based on medical record data, a total of 322 cases were identified, consisting of 78 cases of Condyloma Acuminata (24.22%), 138 cases of Verruca Vulgaris (42.86%), and 106 cases of Seborrheic Keratosis (32.92%). Verruca Vulgaris was the most frequently treated condition during the study period. The findings indicate that electrocautery is a suitable procedure for these dermatological cases; however, its application should be adjusted to the clinical characteristics of each condition. Superficial electrocautery is more appropriate for Condyloma Acuminata to minimize scarring in sensitive mucosal areas, while Verruca Vulgaris requires deeper destruction to reduce the viral reservoir. In Seborrheic Keratosis, low-energy electrocautery, with curettage when necessary, is recommended because the lesion is benign and non-infectious. Therefore, appropriate case-based technique selection is essential to optimize treatment outcomes and maintain patient safety.

References

- Abbas, S., & Watters, D. (2026). The History of Anatomy: How We Learned About the Body's Structure. In *The Road to Modern Surgery: A Historical Journey Through Surgical Landmarks* (pp. 71-90). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-4337-0_4
- Al Rudaisat, M., & Cheng, H. (2021). Dermoscopy features of cutaneous warts. *International Journal of General Medicine*, 14, 9903–9912. <https://doi.org/10.2147/IJGM.S335276>
- Ammad, S., Licata, G., Brancaccio, G., Moscarella, E., & Argenziano, G. (2023). Clinical and dermatoscopic features of seborrheic keratoses according to skin types: A retrospective study. *Dermatology Practical & Conceptual*, e2023253.

<https://doi.org/10.5826/dpc.1304a253>

- Armini, N. P. A., Wijaya, E., & Mahadewi, P. S. P. (2024). Efektivitas kauterisasi kimia dan bedah listrik pada kutil anogenital: Sebuah tinjauan literatur. *Medicina*, 55(3), 160–163. <https://doi.org/10.15562/MEDICINA.V55I3.1360>
- Barthelmann, S., Butsch, F., Lang, B. M., Stege, H., Großmann, B., Schepler, H., & Grabbe, S. (2023). Seborrheic keratosis. *JDDG: Journal der Deutschen Dermatologischen Gesellschaft*, 21(3), 265–277. <https://doi.org/10.1111/ddg.14984>
- Chakraborty, S., Deka, A., Shunyu, B. N., Raphael, V., & Das, S. (2026). A Clinico-Pathological Study of Epistaxis and Its Management. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 1-8. <https://doi.org/10.1007/s12070-026-06518-4>
- Dayeh, S., Abu Ghedda, S., Aljundi, R., & Ishkhanian, S. (2026). Microneedling with bleomycin for treating plantar warts: A prospective cohort study. *Dermatologic Therapy*, 2026(1). <https://doi.org/10.1155/dth/8841176>
- Fu, Y., He, Y., Wang, Z., & Sun, J. (2025). Strategies, barriers, and facilitators for healthcare professionals to recommend HPV vaccination: A systematic review. *Vaccines*, 13(4), 402. <https://doi.org/10.3390/vaccines13040402>
- Guerrini, F., Viglio, A., Zoia, C., Musella, V., Serinelli, P., Klersy, C., ... & Spena, G. (2026). A Novel Plasma Microscalpel Based on Airplasma® Technology. A Histological Analysis of Brain Tissue Damage. *Surgical Innovation*, 15533506261437503.
- Hajilo, P., Imani, B., Zandi, S., & Mehrafshan, A. (2023). Comparing the intraoperative and postoperative complications of the scalpel and electrocautery techniques for severing the inner layers of the lumbar disc during discectomy surgery. *Frontiers in Surgery*, 10, 1264519. <https://doi.org/10.3389/fsurg.2023.1264519>
- Havill, S. (2023). *Kuretase dan kauterisasi (elektrosurgi)*. DermNet. <https://dermnetnz.org/topics/curtette-and-cautery>
- Kalyenci, B., Benlioglu, C., Ölçücü, M. T., Teke, K., Sever, S., Çift, A., & Yücel, M. Ö. (2025). Retrospective analysis of clinical outcomes and early complications of conventional circumcision techniques and thermocautery-assisted circumcision. *Scientific Reports*, 15(1), 7139. <https://doi.org/10.1038/s41598-025-91730-5>
- Kalyenci, B., Benlioglu, C., Ölçücü, M. T., Teke, K., Sever, S., Çift, A., & Yücel, M. Ö. (2025). Retrospective analysis of clinical outcomes and early complications of conventional circumcision techniques and thermocautery-assisted circumcision. *Scientific Reports*, 15(1), 7139.
- Kamilah, L., Adjie, S. P., & Dharmawan, N. (2025). Systematic review of the advantages of trichloroacetic acid and electrocautery therapy in verruca vulgaris. *JKKI: Jurnal Kedokteran dan Kesehatan Indonesia*, 410-422. <https://doi.org/10.20885/JKKI.Vol16.Iss3.art8>
- Kasgriah, A., Adjie, T., & Babaei, N. (2026). Comparative Efficacy and Safety of Trichloroacetic Acid and Electrocautery in the Treatment of Verruca Vulgaris: A Systematic Review. *Journal of the Clinical Ascent*, 1(1), 27-34. <https://doi.org/10.22475/jca.v1i1.29>
- Lian, P., Xu, H., Liu, S., & Qian, H. (2025). Effectiveness of levonorgestrel-based intrauterine insemination system therapy combined with hysteroscopic electrosurgery and radiotherapy in the treatment of highly differentiated endometrial cancer. *International Journal of Radiation Research*, 23(2), 329-334.

- Mawardi, P., Kamilah, L., Fauziyyah Heryadi, F., & Arrosyid, A. (2023). The effectiveness of chemical cautery and electrosurgery on anogenital wart: Systematic review. *Clinical, Cosmetic and Investigational Dermatology*, 16, 2773–2780. <https://doi.org/10.2147/CCID.S426851>
- Mazzoni, D., & Muir, J. (2021). A guide to curettage and cautery in the management of skin lesions. *Australian Journal of General Practice*, 50(12), 893–897. <https://doi.org/10.31128/AJGP-10-20-5695>
- Meghe, S., Ramapure, R., Jaiswal, S., Jawade, S., Singh, S., & Meghe, S. R. (2024). A comprehensive review of minimally invasive dermatosurgical procedures. *Cureus*, 16(3).
- Miyazaki, A., Hamada, S., Okabayashi, H., Akaike, K., Masunaga, A., Okamoto, S., ... & Sakagami, T. (2026). Clinical Significance of Serum (1→3)-β-D-Glucan Positivity in Cryptococcosis: A Retrospective Cohort Study. *Journal of Fungi*, 12(6), 427. <https://doi.org/10.3390/jof12060427>
- Muscoli, S., Cammalleri, V., Marsili, G., Manni, G., Marchei, M., Idone, G., ... & Barillà, F. (2026). Antithrombotic strategies after transcatheter edge-to-edge repair: clinical implications from the MitraSafe study. *Journal of Cardiovascular Medicine*, 27(1), 4-12.
- Nadagouda, S., Madhukumar, H. V., & Chaitra, D. Y. (2026). A Comparative Study of Seroma Formation and Wound Complications in Electrocautery vs. Scalpel Dissection during Modified Radical Mastectomy. *International Journal of Medical and Pharmaceutical Research*, 7, 234-239. <https://zenodo.org/records/19327461>
- Naveed, M., Iqbal, T., Rumman, S., & Dastageer, G. (2026). Comparison of Outcome with Ultrasonic Dissector Versus Electrocautery in Modified Radical Mastectomy: Ultrasonic Dissector vs Electrocautery in MRM Outcomes. *Pakistan Journal of Health Sciences*, 71-75. <https://doi.org/10.54393/pjhs.v7i1.3387>
- Nolin-Lapalme, A., Sowa, A., Delfrate, J., Tastet, O., Corbin, D., Kulbay, M., ... & Avram, R. (2026). Foundation models for electrocardiogram interpretation: clinical implications. *European Heart Journal*, ehaf1119.
- Rahayu, D. A. P. M. P., Grady, G., & Pemayun, T. D. (2025). Studi retrospektif karakteristik subjek pasien kutil anogenital di Poliklinik Kulit dan Kelamin RSUD Wangaya Denpasar periode November 2023–2024. *Media Dermato-Venereologica Indonesiana*, 52(4), 188–191. <https://doi.org/10.33820/MDVI.V52I4.585>
- Saidu, A. M., Noah, C. C., Idrisa, J. A., Zarma, A. S., Girgiri, I. A., Yusuf, A. K., & Bukbuk, D. N. (2026). Differential Modulation of IL-6 and IL-1β by Scalpel versus Electrocautery Excision Influences Wound Healing with Topical Metronidazole in Mice. *Sahel Journal of Veterinary Sciences*, 23(1), 16-22.
- Salma, D. P., MYH, E., & Nurhayati, N. (2025). Gambaran penyembuhan luka sirkumsisi dengan kontrol pendaharan electrocauter menggunakan Southhampton Wound Grading System. *SINERGI: Jurnal Riset Ilmiah*, 2(3), 1605–1612. <https://doi.org/10.62335/sinergi.v2i3.966>
- Sang, K., Kong, Y., Lee, J. K., Na, H. Y., Yu, H. W., & Choi, J. Y. (2026). Performance evaluation of electrosurgical pencils: insights into surgical smoke mitigation and thermal damage reduction. *International Journal of Surgery (London, England)*, 112(6), 12702. <https://doi.org/10.1097/JS9.0000000000005093>

- Sansanwal, G., Srivastava, R. R., & Muduli, B. B. (2026). Automated Surgery: Innovations and Development of Robotics. *Wearable Technologies for Digital Medicine: Advancement, Models, and Applications*, 207-232.
- Siregar, A. M. N., & Hamdani, I. (2026). Comparison of Wound Healing Time in Circumcision Patients with the Finesealer Method and the Electrical Cauter Method. *Buletin Farmatera*, 11(3), 208-218. <https://doi.org/10.30596/bf.v11i3.27148.g14560>
- SNIGDHA, N., LAKSHMANA, R., DEBARATH, D., SOORYA, N., PRAVINDHAS, A., & MANNAN, M. (2025). Comparison of Intraoperative and Postoperative Outcomes of Sleeve and Dorsal Slit Technique of Circumcision: A Prospective Interventional Study. *Journal of Clinical & Diagnostic Research*, 19(1). <https://doi.org/10.7860/JCDR/2025/74061.20550>
- Spiera, R. F., Unizony, S., Warrington, K. J., Sloane, J., Giannelou, A., Nivens, M. C., ... & Dasgupta, B. (2023). Sarilumab for relapse of polymyalgia rheumatica during glucocorticoid taper. *New England Journal of Medicine*, 389(14), 1263-1272. <https://doi.org/10.1056/NEJMoa2303452>
- Workowski, K. A., Bachmann, L. H., Chan, P. A., Johnston, C. M., Muzny, C. A., Park, I., Reno, H., Zenilman, J. M., & Bolan, G. A. (2021). Sexually transmitted infections treatment guidelines, 2021. *MMWR Recommendations and Reports*, 70(4), 1–187. <https://doi.org/10.15585/MMWR.RR7004A1>
- Zhu, P., Qi, R., Yang, Y., Huo, W., Zhang, Y., He, L., Wang, G., Xu, J., Zhang, F., Yang, R., Tu, P., Ma, L., Liu, Q., Li, Y., Gu, H., Cheng, B., Chen, X., Chen, A., Xiao, S., ... Gao, X. (2022). Clinical guideline for the diagnosis and treatment of cutaneous warts (2022). *Journal of Evidence-Based Medicine*, 15(3), 284–301. <https://doi.org/10.1111/jebm.12494>
- Zu, N., Jing, X., Zhou, X. Y., Ma, B. B., Wang, S. J., Qi, X. S., & Liu, L. B. (2026). Endoscopic rubber band ligation, injection sclerotherapy, and sclerobanding for the treatment of internal hemorrhoids. *World Journal of Gastroenterology*, 32(5).