

Case Report

Forensic Diagnostics of Cigarette Burns in a Case of Domestic Abuse: Clinical Evidence and Ex-Vivo Tests Using Porcine Skin

Matteo Antonio Sacco, Lucia Tarda, Saverio Gualtieri, Maria Cristina Verrina and Isabella Aquila * 

Institute of Legal Medicine, Department of Medical and Surgical Sciences, “Magna Graecia” University, 88100 Catanzaro, Italy; matteosacco@unicz.it (M.A.S.); lucia.tarda@studenti.unicz.it (L.T.); saverio.gualtieri@studenti.unicz.it (S.G.); mariacristina.verrina@studenti.unicz.it (M.C.V.)

* Correspondence: isabella.aquila@unicz.it

Abstract

Background: Cigarette burns represent a well-established forensic indicator of inflicted injury, frequently encountered in cases of domestic violence. **Clinical significance:** Their morphological consistency and anatomical distribution offer valuable elements for differentiating between intentional and accidental trauma. **Case Presentation:** In this study, we report the case of a 40-year-old woman who presented with multiple cutaneous lesions attributed to repeated assaults by her intimate partner. The forensic medical examination revealed five discrete scars characterized by sharply demarcated borders, circular to oval shapes, and dimensions ranging from 0.7 to 1.5 cm. These lesions were anatomically located in regions not typically accessible for self-infliction. To reinforce the diagnostic interpretation and assess reproducibility, a controlled experimental protocol was conducted using porcine skin matrices. Cigarette burns were recreated under variable conditions of contact pressure and exposure duration. The lesions produced on the biological substrate exhibited morphological features consistent with those observed in the patient, suggesting compatibility with cigarette-induced thermal injury. **Conclusions:** These findings provide circumstantial support for the forensic interpretation but must be considered within the limitations of the experimental model. This integrated approach underscores the relevance of combining clinical forensic documentation with experimental validation to support medico-legal conclusions in cases of suspected interpersonal violence.

Keywords: forensic science; cigarette burns; experimental model; interpersonal violence; domestic violence



Academic Editor: Teresa Magalhães

Received: 9 September 2025

Revised: 7 December 2025

Accepted: 15 January 2026

Published: 23 January 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

1. Introduction

Domestic violence, encompassing a spectrum of abusive behaviors perpetrated within intimate or familial relationships, remains a critical public health and forensic concern globally [1]. According to the World Health Organization, approximately one in three women worldwide has experienced physical or sexual violence in her lifetime, most often at the hands of a current or former intimate partner (WHO, 2021) [2]. Despite increasing societal and institutional awareness, underreporting, victim silencing, and sociocultural stigmas continue to obscure the true epidemiological magnitude of this phenomenon. From a forensic pathology standpoint, the evaluation of bodily injuries in the context of alleged domestic violence requires a nuanced and interdisciplinary approach [3]. Injuries inflicted during episodes of abuse are frequently characterized by their polymorphic nature, variation in healing stages, and anatomical distribution patterns that often defy

the biomechanics of accidental trauma [4]. Among these, thermal injuries, specifically cigarette burns, represent a distinctive form of inflicted trauma with both diagnostic and legal significance.

Cigarette burns, if inflicted, are typically part of a pattern of coercive control and physical domination [5]. Their forensic identification relies on specific morphological criteria, including the uniformity of shape (often circular or oval), sharply demarcated borders, central necrosis, and their frequent localization in areas not easily accessible for self-infliction [5]. In this context, the ability to distinguish between accidental, self-inflicted, and intentionally inflicted burns is critical for the integrity of medico-legal investigations. However, the interpretation of such lesions should be considered a diagnostic aid, to be integrated with the victim's history, contextual information, and complementary tests. It must also be acknowledged, however, that in certain consensual contexts, such as kink/BDSM practices, burns may be deliberately applied by others with the explicit consent of the individual, resulting in lesions that are morphologically indistinguishable from those produced in abusive scenarios. Therefore, forensic interpretation must go beyond physical indicators and integrate elements of behavioral analysis, victimology, and contextual investigation. It is not uncommon for perpetrators of domestic violence to utilize burns as a form of non-lethal punishment, psychological torture, or symbolic violence. Moreover, the identification of such injuries, especially when observed in clusters or in various stages of healing, may suggest chronic exposure to violence rather than an isolated event. The diagnostic process must, therefore, extend beyond the visible trauma and encompass the victim's narrative, medical history, and psychosocial context.

The scientific literature emphasizes that cigarette burns, due to their unique thermal profile, require a controlled and deliberate application [5–7]. Experimental evidence demonstrates that the temperature at the combustion tip of a lit cigarette can reach up to 600 °C during active inhalation, with a baseline of approximately 300–400 °C in passive burning [8]. These thermal dynamics, combined with the need for direct and sustained contact, render such lesions improbable as accidental injuries, thereby reinforcing their forensic value.

Despite this, there remains a paucity of systematic studies correlating lesion morphology with controlled experimental replication on biological substrates. This paper presents a medico-legal case in which suspected cigarette burns were observed in a female victim of domestic abuse, and describes an explorative *ex vivo* test using porcine skin to reproduce cigarette-related thermal lesions and to explore how contact time and applied force influence lesion morphology. The aim is to explore the relation of contact time and contact force with the morphology of cigarette burns on skin.

2. Detailed Case Description

2.1. Forensic Medical Examination

A 40-year-old woman was referred for forensic evaluation following a formal complaint of prolonged physical abuse by her cohabiting partner. The patient, alert and cooperative during the examination, reported specific episodes of assault involving thermal injury by contact with a lit cigarette, and provided written informed consent for the documentation and use of her anonymized clinical data and photographs for medico-legal purposes.

The physical examination documented five cicatricial skin lesions, all displaying uniform morphological characteristics. These included circular to oval shapes, sharply defined margins, and dimensions consistent with small-area burns (Figure 1a–e).

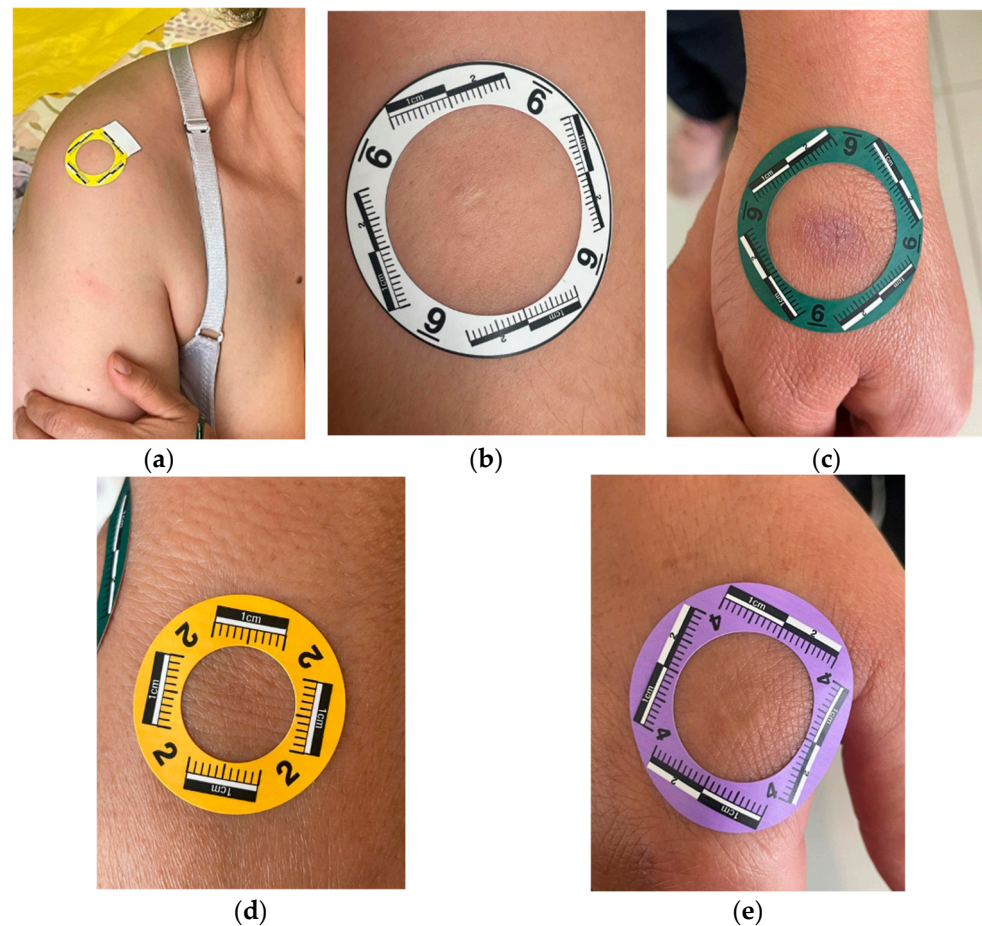


Figure 1. (a–e): Injuries evaluated at the clinical and forensic examination of the woman.

The lesions were distributed across the upper limbs and dorsal surfaces of both hands. Notably, they were located on anatomical sites that typically require assisted application, raising suspicion of third-party infliction. In addition to these scars, multiple traumatic findings were identified, including mucosal and dental injuries, ecchymoses, abrasions, and evidence of previously sutured wounds. All lesions were recorded using calibrated forensic photography and mapped according to standard topographic anatomical charts.

No signs of active infection or recent surgical intervention were observed. The patient did not report self-inflicted injuries, and during the medico-legal interview, she explicitly denied that the burns could have occurred in a consensual or sexualized context. Her account was coherent with the temporal and spatial distribution of the physical findings. A forensic psychological consultation suggested that tendencies toward simulation or self-harm were unlikely. The collected data were submitted to the judicial authority in a formal medico-legal report and served as the foundation for subsequent experimental reproduction of comparable injuries using porcine skin models.

The forensic medical evaluation was conducted in a controlled environment, following standard procedures for the documentation of physical injuries in victims of alleged interpersonal violence. A full-body inspection was performed under uniform LED lighting (5600 K, CRI > 95). The camera was set to a fixed daylight white balance (5600 K) to ensure color consistency, and all images were captured in RAW format. Files were minimally post-processed using Adobe Lightroom, applying only standardized adjustments for exposure and white balance without any alteration of color rendering or image content. Exposure parameters (ISO 200, f/11, 1/125 s) and white balance (fixed at 5600 K) were kept constant for all photographs. Calibrated metric scales were included in each frame. Anatomical

localization, morphological features, and dimensional parameters of each lesion were systematically annotated in the medico-legal report. Dental inspection was carried out with intraoral mirrors and retractors, while mucosal injuries were documented using an intraoral photographic system with LED illumination.

2.2. Experimental Reproduction of Cigarette Burns

To investigate the morphological characteristics of cigarette-induced burns and their diagnostic relevance, a controlled experimental model was implemented using porcine skin matrices as biological substrates. Porcine skin is widely recognized as a valid surrogate for human skin in forensic and dermatological research due to its comparable epidermal and dermal architecture, vascularization, and conductivity [9,10]. Nevertheless, it must be acknowledged that porcine skin is generally thicker and mechanically tougher than human skin, and should therefore be considered when interpreting experimental findings. Also, it does not reproduce vital phenomena such as blood perfusion or inflammatory response.

Fresh porcine skin was obtained from commercially processed swine carcasses within the food supply chain, ensuring compliance with ethical and sanitary regulations. The animal materials referenced in the manuscript are post-mortem specimens purchased from a retail food market (already in commerce and not obtained from living animals or experimental procedures). Therefore, no animal experimentation was performed, and no owner-informed consent is required. Specimens were harvested from the dorsal thoracic region to maintain consistency in dermal thickness and were cut into standardized segments measuring 18.0×12.5 cm with an approximate thickness of 0.5 cm. Porcine dorsal skin has epidermal and dermal thickness values (≈ 50 – 90 μm and 2.0 – 2.5 mm) that closely approximate those of human skin in the deltoid, arm and dorsal hand regions (≈ 40 – 80 μm and 1.5 – 2.0 mm), corresponding to the sites where the patient's injuries were located. The skin was thoroughly cleaned with sterile saline solution and stored at 4°C until use, with a maximum storage time of 6 h prior to experimentation.

2.3. Burning Instrument and Protocol

A commercially available tobacco cigarette (Marlboro Red, Philip Morris International (Philip Morris International, New York, NY, USA); diameter 0.7 cm, length 8.5 cm, filter-tipped) was used as the burn-inducing agent (Figure 2a,b).

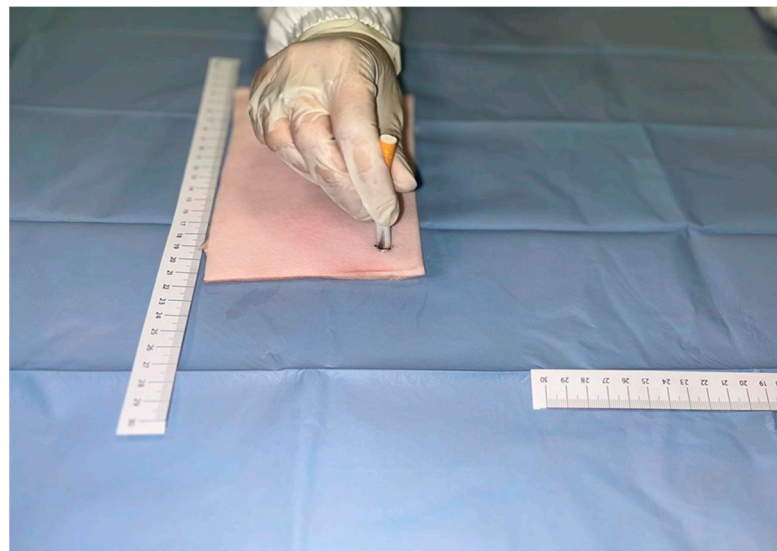


(a)

Figure 2. Cont.



(b)



(c)

Figure 2. (a). Experimental setup for cigarette burn reproduction. Detail of the tip of the tobacco cylinder (industrial cigarette). The diameter of the cigarette is approximately 0.7–0.8 cm, corresponding to the contact surface relevant for evaluating the thermal imprint produced in the experimental model. (b). Preparation of the experimental setup for the production of cigarette-induced thermal alterations on fresh porcine skin. The configuration includes: skin of standardized dimensions, millimetric rulers for lesion measurement, and a commercial cigarette with a filter. Porcine skin samples were equilibrated to room temperature before testing, although the lack of active thermal regulation remains a limitation compared with *in vivo* conditions. (c). Controlled application of a lit cigarette butt on non-living porcine skin. Image documenting the initial moment of thermal contact under standardized conditions for each trial.

Each cigarette was ignited and allowed to reach a steady combustion phase prior to contact. The tip temperature was maintained passively, without puffing, in order to approximate a common real-life assault scenario where the cigarette is directly applied to the skin without active inhalation. Four discrete burns were induced on each skin sample, spaced at least 3 cm apart to avoid thermal overlap. This spacing was selected to avoid thermal overlap between burns. Experimental studies on localized heat transfer from small-area thermal sources have shown that the effective lateral heat-diffusion zone in porcine skin is generally confined to approximately 1 cm under controlled conditions [9].

However, this diffusion range is strongly influenced by tissue thickness and substrate properties; therefore, thinner excised samples placed on an insulating support may exhibit a broader heat-diffusion profile compared with full-thickness *in vivo* tissue. The cigarette was applied perpendicularly to the skin surface with the glowing tip oriented downward. It must be noted, however, that the experimental skin segments were relatively thin and positioned on a rigid, insulated support, which may have influenced heat flux patterns compared to the continuous soft tissue depth present *in vivo*, where no edge effect occurs. The pressure applied and contact duration were varied across trials to simulate different intensities of injury:

1. Trial 1: Minimal contact force, <1 N, for ~1 s.
2. Trial 2: Moderate contact force, ~2 N, for 2 s.
3. Trial 3: The cigarette tip was allowed to accumulate approximately 3–4 mm of ash by maintaining combustion for about 60–70 s without puffing before contact. This condition was intended to enhance tip heat retention and surface temperature stability. This condition was applied only in Trial 3 because each trial was designed to test a different real-life scenario: Trials 1 and 2 replicated immediate contact after ignition, whereas Trial 3 specifically explored the effect of accumulated ash on heat transfer. The burn was then applied with ~2 N force for 2 s.
4. Trial 4: Maximal pressure (~4 N), contact time > 3 s, until cessation of visible smoke emission.

In this experimental design, contact pressure and exposure time varied simultaneously across the trials, and no condition was implemented in which only one variable was isolated (for example, applying 2 N for 1 s, or 1 N for 2 s). As a result, the model cannot support any independent inference regarding the specific contribution of pressure versus time to burn morphology. Each trial, therefore, represents a composite scenario illustrating how different real-life conditions might qualitatively influence lesion appearance, without implying a parametric or quantifiable causal effect for either variable alone.

Each application was performed manually by a single operator to reduce inter-operator variability. Force estimation was calibrated in preliminary trials using a load cell to simulate manual application, although the absence of real-time force control represents a methodological limitation.

2.4. Documentation and Analysis

Post-burn, all lesions were photographed with the same high-resolution system used in the clinical examination. A sterilizable measurement grid with 0.5 cm intervals was gently placed in direct contact with the skin surface (without marking or drawing on the tissue) to allow precise dimensional analysis while avoiding any alteration of the lesion morphology. Macroscopic features such as shape, border definition, central discoloration and peripheral chromatic alteration were recorded for each injury under fixed exposure settings and a constant daylight white balance (5600 K), and uniform lighting conditions provided by two continuous LED light sources (CRI > 95, 5600 K), ensuring consistent color rendering across all images. Lesion dimensions were recorded using a calibrated metric ruler and a 0.5 cm measurement grid placed adjacent to each lesion. For each lesion, three independent measurements of maximum and minimum diameter were taken, and the mean value was calculated. Variability was expressed as standard deviation (SD), which did not exceed ± 0.1 cm. Optical resolution of the photographic system was 6000×4000 pixels (24.2 MP), corresponding to a spatial resolution of ~0.1 mm at the working distance. All images included a standardized metric scale to ensure reproducibility and allow post hoc verification of measurements. The experimental lesions were then directly compared to the patient's injuries in terms of morphology, size, and anatomical plausibility. Particular

attention was given to the assessment of lesion shape, the presence of concentric burn zones, and the depth of apparent thermal damage that was assessed macroscopically based on surface texture changes, loss of epidermal continuity, and depressed central areas. The model was implemented on cadaveric tissue and did not involve experimentation on living animals, in accordance with applicable ethical guidelines.

3. Results

3.1. Clinical Observations

The forensic examination of the patient revealed a total of five cutaneous cicatricial lesions consistent with healed thermal injuries. All lesions exhibited well-defined morphological features and were located on the upper limbs and shoulders. Specifically, a hypopigmented, circular scar measuring 0.7 cm in diameter was observed on the right deltoid region (Figure 1a). On the mid-third of the left arm, over the lateral surface, there was a circular scar measuring 1.5 cm, surrounded by a peripheral hyperchromic halo (Figure 1b). The dorsum of the left hand, over the first metacarpal, showed a violaceous lesion with a central rose-colored atrophic scar measuring 1.5 cm in diameter (Figure 1c). Another scar was located on the dorsum of the left hand, over the third metacarpal; it was oval, hypopigmented, and measured 0.8 cm (Figure 1d). Finally, the intermetacarpal region between the first and second digits of the right hand presented a slightly elevated, hypopigmented lesion with a diameter of 1.0 cm (Figure 1e).

Overall, scar size ranged from 0.7 to 1.5 cm, with a median diameter of approximately 1.0 cm. All lesions were photographed under fixed exposure settings and constant daylight white balance (5600 K), with a calibrated metric scale included in each image.

In addition to these five lesions, other trauma-related findings were observed. These included a rectangular hyperpigmented scar measuring 2.5 cm in the left supraorbital region with features suggestive of prior suturing, and multiple mucosal lacerations approximately 3.5 cm in length on the lower buccal mucosa. There was also evidence of mobility and chipping of the central maxillary incisors. A violaceous ecchymotic patch measuring 1.5×0.9 cm was noted on the left lateral neck, and an ecchymotic and excoriated area measuring 2.5×2.5 cm was documented on the right scapular surface. Linear excoriations of first and second degree were present on the volar surface of the left forearm, extending 10.3 cm in length. Finally, a rectangular hypopigmented and mildly elevated scar measuring 2×1.5 cm was noted on the left patellar surface.

The presence of lesions in multiple anatomical regions, in differing stages of healing and with variable morphologies, was systematically documented using high-resolution photography and morphometric analysis. Morphological differences among the scars were consistent with variable healing stages: some scars showed hypopigmented, flattened morphology suggestive of older injuries, while others exhibited more recent hyperchromic borders and slight elevation compatible with subacute healing (weeks to months). These findings, combined with the patient's history, support the hypothesis of repeated application rather than a single traumatic episode.

3.2. Experimental Findings

The reproduction of cigarette burns on porcine skin yielded four distinct lesions, each corresponding to a specific variation in pressure and contact time. In the first trial (Figure 3a,b), minimal pressure (<1 N) and a brief exposure time (approximately 1 s) generated a superficial, circular alteration measuring 0.7 cm in diameter, with defined margins and a central pale zone surrounded by a chromatically altered periphery.

In the second trial (Figure 3c), moderate contact pressure (~ 2 N) and 2 s exposure produced an oval lesion measuring 0.8 cm in diameter, with a darkened center and diffuse peripheral pigmentation.

In the third trial (Figure 3d), a lesion measuring ~ 1.0 cm was observed, characterized by a depressed center and broader chromatic diffusion due to retained hot ash at the tip.

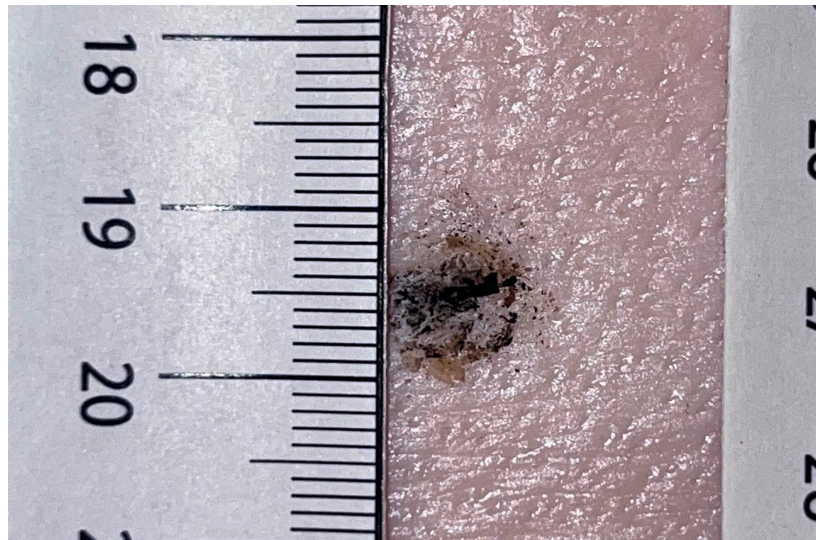
In the fourth trial (Figure 3e), maximum pressure (>4 N), prolonged contact time (>3 s) resulted in a lesion of 1.4 cm, with sharply demarcated edges, surface disruption, and intense central pigmentation.

A comparative overview (Figure 3f) illustrates the progressive increase in lesion size (0.7–1.4 cm) and severity as a function of applied pressure and exposure time.

Overall, experimental lesion size ranged from 0.7 to 1.4 cm, with a median of ~ 1.0 cm. All experimental images included calibrated metric rulers to ensure standardized magnification and reproducibility.



(a)

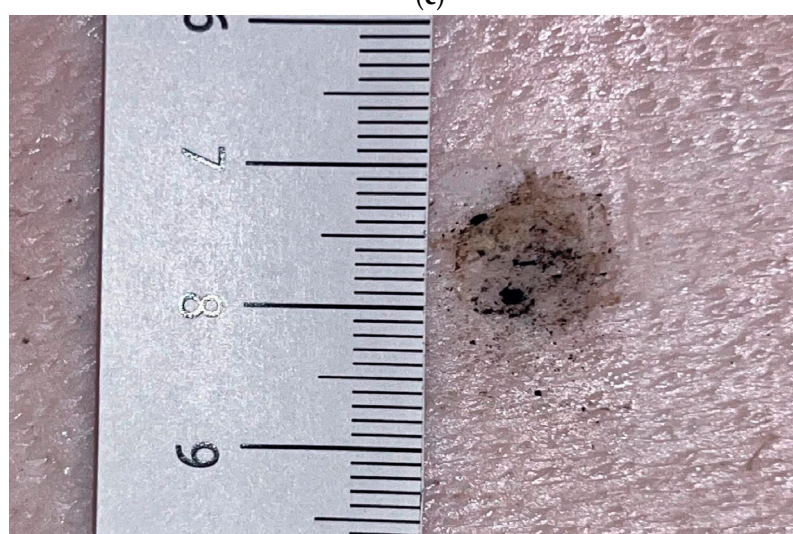


(b)

Figure 3. Cont.



(c)

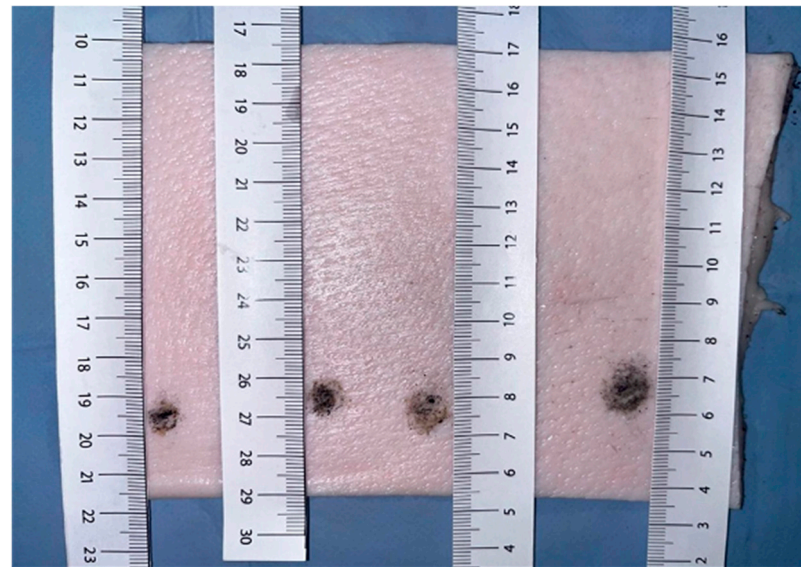


(d)

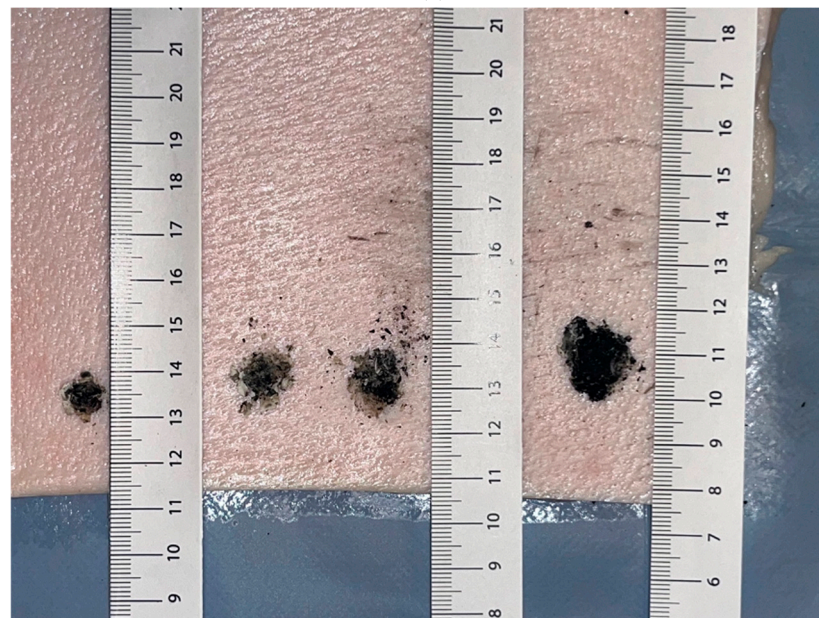


(e)

Figure 3. *Cont.*



(f)



(g)

Figure 3. (a) Result of first experimental trial: minimal contact force (~ 1 N) and exposure duration of 1 s. The lesion appears circular (0.7 cm diameter), with defined borders, a central pale zone, and peripheral chromatic alteration. (b) Experimental thermal alteration produced by contact with a lit cigarette. A central area of surface darkening with peripheral discoloration is visible. This image refers to Trial 1, which involved both minimal contact force (≈ 1 N) and a brief exposure time (≈ 1 s); therefore, the resulting morphology reflects the combined effect of these parameters rather than the influence of time alone. A calibrated metric ruler is included for standardized magnification. (c) Result of second trial: moderate contact force (~ 2 N), 2 s exposure. This image refers to Trial 2 and was taken after the gentle removal of superficial ash deposits. Small residual particles remained visible because the ash layer was fragile and loosely adherent, and more aggressive cleaning would have risked altering the surface morphology of the burn. Oval alteration (~ 0.8 cm diameter), showing a darkened center and diffuse peripheral pigmentation. The lesion measured approximately 0.8×0.7 cm. The slight oval appearance was due to a minimal asymmetry of the burn margins (~ 1 mm) and not to ash deposition. Morphology aligns with the shape of the cigarette tip. A calibrated metric ruler is included for standardized magnification. (d) Result of Trial 3. The

lesion shows a more pronounced central depression compared with the superficial contour observed in Trials 1 and 2. The lesion measures approximately 1.0 cm, with a depressed center and broader chromatic diffusion. The lesion exhibited a deeper central depression visible macroscopically; depth was evaluated solely through macroscopic surface contour assessment. Because this method cannot provide reliable or reproducible depth measurements across specimens, lesion depth was not systematically quantified for all samples. A calibrated metric ruler is included for standardized magnification. (e) Result of fourth trial: maximum contact pressure (>4 N) and prolonged exposure (>3 s). The resulting area (~ 1.4 cm diameter) exhibits sharply demarcated edges, surface disruption, and intense central pigmentation. After gentle removal of the residual ash, a true central pigmentation was clearly visible. A calibrated metric ruler is included for standardized magnification. (f) Overview of the four experimental lesions (left to right: Trials 1–4). Images were taken after the gentle removal of superficial ash deposits. Small residual particles remained visible because more aggressive cleaning would have risked altering the surface texture and margin definition of the burns, thereby compromising the integrity of the lesions. The photographic documentation was performed under uniform LED lighting, fixed exposure settings, and calibrated metric scales to ensure consistency. The purpose of this comparative overview is to illustrate the qualitative progression in size, pigment alteration, and surface disruption across the four trials. (g) Burn surface immediately after cigarette-tip contact, before ash removal, left to right: Trials 1–4). Residual ash is visible as granular material on the surface.

4. Discussion

The forensic assessment of thermal injuries, particularly those attributed to cigarette burns, remains a fundamental aspect of medico-legal investigation in suspected cases of domestic violence. In the present case, the experimental model can only illustrate a qualitative trend in which burns produced under conditions of greater force combined with longer contact appear larger within this specific substrate. The similar circularity and size observed between the scars and the experimentally induced lesions support the plausibility of cigarette burns as the underlying mechanism of injury, reinforcing their diagnostic value in forensic practice.

Cigarette burns are widely recognized as characteristic indicators of inflicted trauma [5]. Their distinctive morphology—circular or oval configuration, sharply demarcated borders, and a central depressed or darkened zone—makes them highly specific compared to other types of thermal injury. The underlying mechanism is related to the localized transfer of high temperature, which in the case of cigarettes can exceed 300 – 600 °C depending on the combustion phase [9–11]. While previous studies have established the typical contact duration and lesion diameter of cigarette burns [12,13], the present *ex vivo* observations serve to illustrate, rather than redefine, these parameters and to show how varying pressure and time qualitatively influence lesion size.

In the present case, the distribution of lesions across the upper limbs and dorsal hands is noted for documentation purposes. The concern does not relate to reachability but to pattern: the lateral and dorsal arm surfaces are classic sites for inflicted cigarette burns, whereas self-inflicted thermal injuries typically cluster on visible anterior areas such as the volar forearms. Patterns involving mixed healing stages and lesions on the dorsal hands and upper limbs have been described in the forensic literature as commonly associated with inflicted burns [5,13,14]. In the present report, this observation is descriptive only and does not imply diagnostic certainty. Furthermore, the presence of multiple scars in different healing phases is a well-established marker of repeated episodes of violence [11]. Nevertheless, it must be acknowledged that in some contexts, such as consensual BDSM practices and certain Asian healing practices, similar lesions may be observed. For this reason, a comprehensive medico-legal evaluation must always integrate not only the morphology of the lesions but also the victim's narrative, psychological assessment, and contextual data [15].

The experimental test on porcine skin demonstrated how variations in contact duration and applied force modulate the severity of thermal injury.

Accidental burns, such as those sustained during sleep while smoking, typically result in superficial and irregular lesions, lacking the symmetry and borders seen in this case [6]. Self-inflicted burns are often found in anatomically accessible regions and generally display less distributional variability [5]. Other thermal sources, such as lighters or heated metallic tools, generate distinct morphologies that can be distinguished by careful analysis [8,12]. Dermatological conditions, including impetigo, staphylococcal scalded skin syndrome, or post-inflammatory pigmentary alterations, can mimic burn scars, but they lack the geometrical precision and uniformity associated with cigarette burns [14–19].

This study has limitations that should be acknowledged. Porcine skin, although widely accepted as a surrogate for human skin in forensic and dermatological research due to its structural similarities, is generally thicker and tougher, which may influence burn depth and morphology. Moreover, although skin samples were equilibrated to room temperature, the lack of active regulation of tissue and substrate temperature means that heat flux dynamics may not fully replicate *in vivo* conditions. For this reason, the present model can illustrate how a brief and gentle contact produces a less marked thermal effect than a longer and more forceful one, and it cannot replicate the full thermodynamic response of warm, perfused *in vivo* tissue. Also, the finite thickness of the excised skin may have introduced edge effects and the transverse heat distribution absent in living tissue. In addition, burns were applied manually, with force benchmarked only in pre-tests, and not monitored in real time, which may reduce reproducibility. Morphological similarity was assessed directly by the study authors with macroscopic evaluation, without independent raters and without any predefined comparison criteria or inter-rater reliability testing and controls. Despite these methodological constraints, the combined clinical and empirical approach adopted in this study provides forensic insight, and the recognition of the experimental limitations ensures that the results are interpreted cautiously and transparently. Future work should include thermodynamically controlled setups, real-time monitoring of applied force, and substrates with greater physiological fidelity. Larger patient cohorts and multicenter validation studies are needed to confirm the reproducibility, specificity, and generalizability of these observations.

Author Contributions: Conceptualization, I.A. and M.A.S.; formal analysis, L.T. and M.C.V.; data curation, S.G.; writing—original draft preparation, I.A. and M.A.S.; supervision, I.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This is a clinical case report carried out within ordinary medico-legal activity. In Italy and in the European Union, case reports that do not involve experimental procedures do not require ethics committee approval, as established by the EU General Data Protection Regulation (EU Regulation 2016/679, Articles 6 and 9) and by the Italian Data Protection Code (Legislative Decree 196/2003 as amended by Legislative Decree 101/2018). These regulations allow the scientific use of anonymized clinical information when written informed consent is obtained.

Informed Consent Statement: Written informed consent for the use of anonymized clinical data and images was obtained from the patient.

Data Availability Statement: Data are contained within the article or. The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Sacco, M.A.; Caputo, F.; Ricci, P.; Sicilia, F.; De Aloe, L.; Bonetta, C.F.; Cordasco, F.; Scalise, C.; Cacciatore, G.; Zibetti, A.; et al. The impact of the COVID-19 pandemic on domestic violence: The dark side of home isolation during quarantine. *Med. Leg. J.* **2020**, *88*, 71–73. [\[CrossRef\]](#) [\[PubMed\]](#)
2. World Health Organization (WHO). *Violence Against Women Prevalence Estimates, 2018: Global, Regional and National Prevalence Estimates for Intimate Partner Violence and Non-Partner Sexual Violence*; WHO: Geneva, Switzerland, 2021.
3. Feki, N.; Soiniya, R.; Ouni, M.; Siala, H.; Karray, N.; Bardaa, S.; Hammami, Z.; Ben Amar, W.; Zribi, M. Intimate partner violence in southern Tunisia: A retrospective study of the sociodemographic and medicolegal clinical profile. *J. Forensic Leg. Med.* **2025**, *112*, 102855. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Borsay, B.Á.; Halasi, B.D.; Pórszász, R.K.; Gergely, P.A. Homicide-suicide as domestic violence: A case report with a little literature review. *Leg. Med.* **2025**, *72*, 102557. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Faller-Marquardt, M.; Pollak, S.; Schmidt, U. Cigarette burns in forensic medicine. *Forensic Sci. Int.* **2008**, *176*, 200–208. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Amadasi, A.; Schönfeld, C.; Etzold, S. Accident or abuse? Differential diagnosis of contact burns from radiators/heaters in children. *Forensic Sci. Med. Pathol.* **2025**, *21*, 773–778. [\[CrossRef\]](#) [\[PubMed\]](#) [\[PubMed Central\]](#)
7. Amadasi, A.; Schwarz, F.; Berti, L.; Oesterhelweg, L. Hair straightener burns in children: An experimental study originating from 2 cases. *Forensic Sci. Int.* **2024**, *365*, 112270. [\[CrossRef\]](#) [\[PubMed\]](#)
8. Holmes, A.L.; Bugeja, L.; Young, C.; Ibrahim, J.E. Deaths due to thermal injury from cigarette smoking in a 13-year national cohort of nursing home residents. *Int. J. Older People Nurs.* **2019**, *14*, e12233. [\[CrossRef\]](#) [\[PubMed\]](#)
9. Harel, S.; Burkey, B.; Nanassy, A.D.; Marcolongo, M.; Phillips, E.; Campbell, C.; McColgan, M.D. Flame time of a cigarette lighter to achieve temperature capable of inflicting a burn. *Burns* **2017**, *43*, 1227–1232. [\[CrossRef\]](#) [\[PubMed\]](#)
10. Sullivan, T.P.; Eaglstein, W.H.; Davis, S.C.; Mertz, P. The pig as a model for human wound healing. *Wound Repair Regen.* **2001**, *9*, 66–76. [\[CrossRef\]](#) [\[PubMed\]](#)
11. Tanaka, T.; Kasai, K.; Yoshida, K.; Sato, H. Butane detection after long-term treatment of burns in two autopsy cases. *Leg. Med.* **2021**, *49*, 101847. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Tambuzzi, S.; Gentile, G.; Primavera, R.; Muccino, E.; Zoja, R. Pilot Application of SEM/EDX Analysis on Suspected Cigarette Burns in a Forensic Autopsy Case of Child Abuse. *Am. J. Forensic Med. Pathol.* **2024**, *45*, 135–143. [\[CrossRef\]](#) [\[PubMed\]](#)
13. Shavit, I.; Knaani-Levin, H. Images in emergency medicine. Child abuse caused by cigarette burns. *Ann. Emerg. Med.* **2008**, *51*, 579–582. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Porzionato, A.; Aprile, A. Staphylococcal scalded skin syndrome mimicking child abuse by burning. *Forensic Sci. Int.* **2007**, *168*, e1–e4. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Grellner, W.; Metzner, G. Kindesmisshandlung durch thermische Gewalt—Abgrenzung und Rekonstruktion [Child abuse caused by thermal violence—determination and reconstruction]. *Arch. Kriminol.* **1995**, *195*, 38–46. (In German) [\[PubMed\]](#)
16. Bista, S.; Duffy, B.; Michaels, N.L. Characterising fire or burn-related fatalities in the USA using the National Violent Death Reporting System, 2003–2020. *Inj. Prev.* **2024**, online ahead of print. [\[CrossRef\]](#)
17. Kroll, M.W.; Ritter, M.B.; Williams, H.E. Fatal and non-fatal burn injuries with electrical weapons and explosive fumes. *J. Forensic Leg. Med.* **2017**, *50*, 6–11. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Sardinha, L.; Maheu-Giroux, M.; Stöckl, H.; Meyer, S.R.; García-Moreno, C. Global, regional, and national prevalence estimates of physical or sexual, or both, intimate partner violence against women in 2018. *Lancet* **2022**, *399*, 803–813. [\[CrossRef\]](#) [\[PubMed\]](#) [\[PubMed Central\]](#)
19. Rodríguez-Bolaños, R.; Díaz-Andrade, E.; Ramírez-Palacios, P.; Rojas-Carmona, A.; Gallegos-Carrillo, K.; Barrientos-Gutiérrez, I.; Cruz-Jiménez, L.; Vidaña-Pérez, D.; Arillo-Santillán, E.; Thrasher, J.F. Associations between interpersonal violence and cigarette smoking, e-cigarette use, and dual use among Mexican adolescent students. *Front. Public Health* **2025**, *13*, 1516135. [\[CrossRef\]](#) [\[PubMed\]](#) [\[PubMed Central\]](#)

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.