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ORIGINAL ARTICLE

Dermoscopic features of benign sebaceous proliferations in dogs: Description, assessment and interobserver agreement

Scarpella Fabia¹  | Colombo Silvia¹  | Dehesa Alexandra¹ |
Godizzi Francesco² | Cavicchini Stefano³ | Fabbri Elisabetta⁴ |
Roccabianca Paola² 

¹Studio Dermatologico Veterinario, Milan, Italy

²Department of Veterinary Medicine and Animal Sciences (DIVAS), Università degli Studi di Milano, Lodi, Italy

³Dermatologist Private Practitioner, Milan, Italy

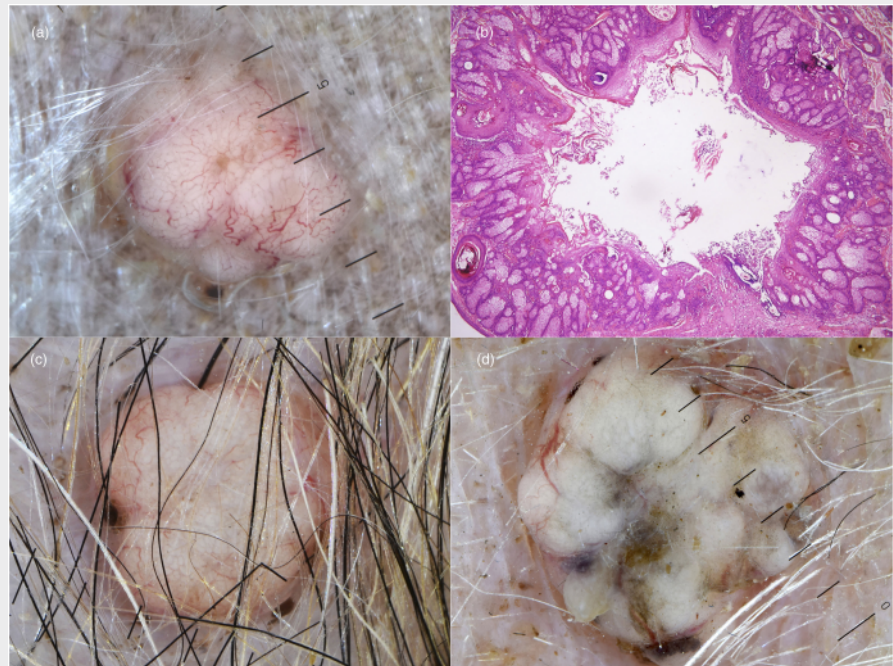
⁴U.O. Ricerca Valutativa e Policy dei Servizi Sanitari. Programma Unico per l'Innovazione e la Ricerca AUSL-IRST, Azienda USL della Romagna, Rimini, Italy

Correspondence

Scarpella Fabia, Studio Dermatologico Veterinario, via Giancarlo Sisoni 62, Milan 20133, Italy.
Email: fabia.scarpella@gmail.com

Graphical Abstract

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Background – Dermoscopy is a useful, noninvasive technique also used to assess sebaceous lesions in humans. Sebaceous hyperplasia, sebaceous adenoma and sebaceous epithelioma are common cutaneous lesions in dogs; however, their dermoscopic features have not been investigated.

Hypothesis/Objectives – The objectives of this study are to describe the dermoscopic features of canine sebaceous lesions and to assess the interobserver agreement on dermoscopic parameters. **Conclusions and**

Clinical Relevance – Dermoscopy represents a useful technique to assess sebaceous gland proliferations in dogs, as it is in humans.

ORIGINAL ARTICLE

Dermoscopic features of benign sebaceous proliferations in dogs: Description, assessment and interobserver

1 agreement

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Correspondence

Scarpella Fabia, Studio Dermatologico Veterinario, via Giancarlo Sismondi 62, Milan 20133, Italy.
Email: fabia.scarpella@gmail.com

Abstract

Background: Dermoscopy is a useful, noninvasive technique also used to assess sebaceous lesions in humans. Sebaceous hyperplasia, sebaceous adenoma and sebaceous epithelioma are common cutaneous lesions in dogs; however, their dermoscopic features have not been investigated.**Hypothesis/Objectives:** The objectives of this study are to describe the dermoscopic features of canine sebaceous lesions and to assess the interobserver agreement on dermoscopic parameters.**Animals:** Thirty-four lesions excised from 17 client-owned dogs, histologically confirmed as sebaceous proliferations, were included in this study.**Materials and Methods:** Sebaceous lesions were evaluated in vivo at ×10 magnification with a handheld dermoscope. Each dermoscopic image was assessed independently by two ECVD board-certified veterinary referral clinicians and an ECVD resident.**Results:** Thirty sebaceous hyperplasias, two sebaceous adenomas and two sebaceous epitheliomas were included. Dermoscopically, most lesions (91%) had single or multiple, well-defined, white-yellowish structures composed of grouped ovoid areas (clods). Irregular linear and, less commonly, arborising vessels were detected at the periphery of the yellow lobular-like structures in 93% of sebaceous hyperplasias and in 50% of neoplastic lesions. Erosions were seen in 6% of sebaceous hyperplasias and 50% of neoplastic lesions. Good interobserver agreement was found for white/yellowish clods ($k=0.75$), yellow scales ($k=0.83$), brown/grey dots ($k=0.80$), erosions ($k=0.82$) and red/brownish scales/crusts ($k=0.75$). There was moderate agreement for fissures ($k=0.48$) and vascular pattern ($k=0.51-0.53$).**Conclusions and Clinical Relevance:** Dermoscopy represents a useful technique to assess sebaceous gland proliferations in dogs, as it is in humans.

KEYWORDS

dermoscopic features, dermoscopy, dogs, sebaceous adenoma, sebaceous epithelioma, sebaceous hyperplasia

INTRODUCTION

Dermoscopy, also known as dermatoscopy or epiluminescence microscopy, is a noninvasive diagnostic technique allowing for prompt, magnified in vivo observation of the skin and the visualisation of pigmented, nonpigmented and vascular structures that are poorly visible

to the naked eye.¹ Dermoscopy can be performed with a nonpolarised (NPD) or polarised (PD) light source. Sequential use of PD and NPD often provides complementary information and reveals important diagnostic clues regarding skin lesions.²

In humans, dermoscopy is considered a relevant diagnostic aid mainly for the early detection of skin

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cancer,³ increasing the diagnostic accuracy for pigmented and nonpigmented skin neoplasms, thus reducing the number of unnecessary biopsies.^{3,4}

Sebaceous hyperplasia is the most common sebaceous gland proliferation in humans, characterised by white-yellowish umbilicated papules of 2–9 mm in diameter, mainly on the face of older adults; these feature, by dermoscopy, clusters of white-yellowish lobular-like structures (clods) surrounded by fine, linear, sometimes irregular, vessels at the periphery (crown pattern).^{5–7}

Nodular sebaceous hyperplasia is a common skin lesion comprising 23% of all non-neoplastic canine skin masses,⁹ observed mainly in older dogs and accounting for the majority of canine sebaceous gland lesions.^{9,10} These lesions are generally single or multiple, <1 cm in diameter, yellowish, wart- or cauliflower-like and occurring anywhere on the body.^{10,11}

Sebaceous skin tumours are more frequently benign in dogs and have recently been reported to represent 5.3%–6% of all canine skin tumours, with adenomas (3.3%) and epitheliomas (1.7%) being more common than carcinomas (0.7%).^{9,10,12}

Of note, sebaceous hyperplasia is often found peripheral to and phasing into sebaceous adenoma, epithelioma or, more rarely, adenocarcinoma, and it is likely to be a precursor to their development.¹¹

The clinical appearance of sebaceous hyperplasia in dogs is considered characteristic, yet histopathological examination is deemed necessary to confirm the diagnosis and to differentiate it from neoplastic lesions.

To date, dermoscopy has been used in veterinary dermatological practice to describe normal feline and equine skin,^{13,14} and hair follicle parameters in healthy dogs.^{15,16} Furthermore, dermoscopic features in dogs with pattern alopecia,¹⁶ alopecia areata¹⁷ and diverse infectious (feline^{18,19} and canine dermatophytosis²⁰), parasitic (canine demodicosis¹⁵ and sarcoptic mange²¹) and congenital diseases (acral congenital superficial dermal lymphatic malformation in two cats²²) have been reported. To the best of the authors' knowledge, no information on dermoscopy of canine sebaceous gland hyperplasia and other sebaceous skin tumours is currently available.

The aims of this study were to describe the dermoscopic features of canine sebaceous hyperplasia, sebaceous adenoma and sebaceous epithelioma that were subsequently excised and examined histologically, and to assess the interobserver agreement of dermoscopic parameters, with histopathological diagnosis as the gold standard.

MATERIALS AND METHODS

Study population

Cases were referred to the dermatology service for the evaluation of cutaneous nodules. Thirty-four lesions excised from 17 client-owned dogs, histologically diagnosed as sebaceous proliferations, were included

in this study. There were 30 sebaceous hyperplasias, two sebaceous adenomas and two sebaceous epitheliomas. Lesions came from five intact males, two castrated males, two intact females and eight spayed females, ranging in age from 2 to 13 years old (mean age 6.4 years). Informed owner consent was obtained before any clinical, surgical or diagnostic procedure, following the good clinical practices in accordance with ethics guidance (published in GURI [Gazzetta Ufficiale della Repubblica Italiana] 1996;289:47–53).

Dermoscopic definitions

Morphological analysis was performed in line with the descriptive terminology proposed by Rosendahl et al.²³ According to this paper, anatomical structures, lesions and vessels are described in simple geometric terms that are applicable regardless of the definitive diagnosis (Figure 1).

In detail, Rosendahl reports five basic elements typically used to describe pigmented structures³ that are objectively defined using the following terms (Figure 1):

- line: a 2D continuous object with length greatly exceeding width;
- pseudopod: a line with a bulbous end;
- dot: an object too small to have a discernable shape;
- circle: a curved line equidistant from a central point; and
- clod: any well-circumscribed, solid object larger than a dot; clods may take any shape.

Lines are further classified into five types related to their architectural pattern: reticular, branched, parallel, radial and curved.²³

The terms dots, clods and lines also are applied to vessels and to vascular arrangements relating to their specific patterns. Vessels appearing as lines (linear vessels) may take different forms (Figure 1).

In order to better characterise the lesions, additional descriptive terms were added by the authors: fissures (long, narrow folds on the surface of the nodule), scales (white to yellow, small dry clods lying on the skin surface), scales/crusts (red/brownish, medium-sized and thick clods attached to the skin surface) and erosions (loss of epidermal layers with basement membrane sparing) (Figure 2).

Dermoscopic examination

Cutaneous lesions were evaluated in vivo at ×10 magnification on the same day as the surgical excision with a contact nonpolarised light dermoscope (Heine Delta 20 Plus; Intermed SRL). A gel interface (Ultrasound gel transparent; GIMA SpA) was applied to the lesion before dermoscopic examination in order to reduce the pressure on blood vessels. The dermoscope was connected to a digital camera (D3100; Nikon Europe BV), and all digitised images were captured in JPEG format.

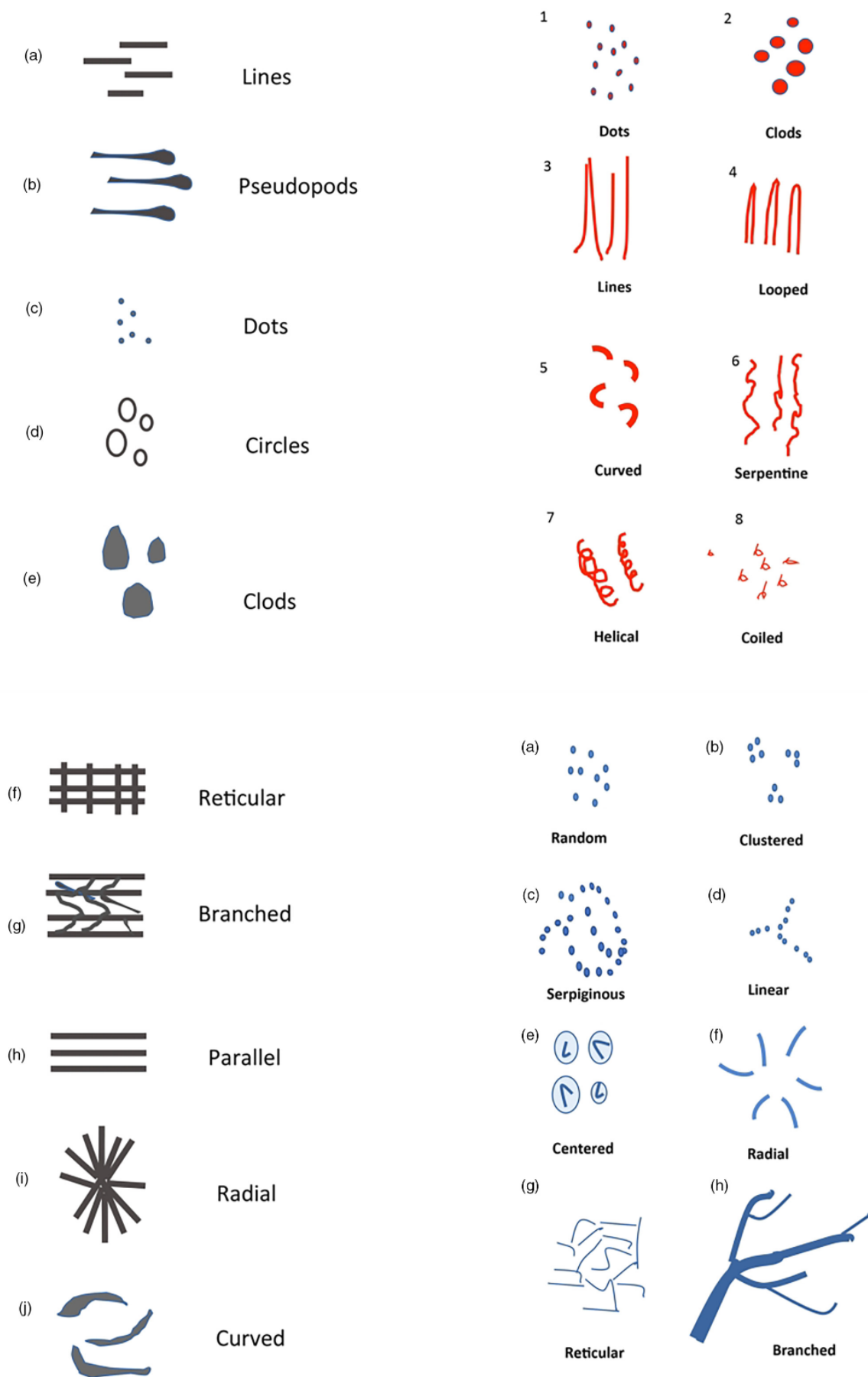


FIGURE 1 Structures and vessel patterns seen with a dermatoscope. Structures (left): lines (A), pseudopods (B), dots (C), circles (D), clods (E). Lines can be reticular (F), branched (G), parallel (H), radial (I), or curved (J). Vessel patterns (right): vessel structure: dots (1), clods (2), lines (3), looped (4), curved (5), serpentine (6), helical (7), coiled (8). Vessel arrangement: random (a), clustered (b), serpiginous (c), linear (d), centred (e), radial (f), reticular (g), branched (h). Modified and adapted from Rosendahl et al. Dermoscopy in routine practice – ‘chaos and clues’. Aust Fam Physician 2012;41:482–7. Drawings made by the first author.

Basic elements

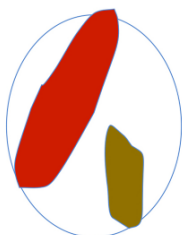


Dots: an object too small to have a discernable shape



Clods: any well circumscribed, solid object larger than a dot; clods may take any shape

Descriptive terms



Scales/crusts: red/brownish, medium-sized, and thick clods attached to the skin surface



Scales: white to yellow, dry small clods layed on the skin surface

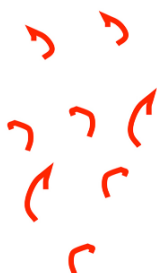


Erosions/ulcers: loss of epidermal layers/including the basement membrane in case of ulcers

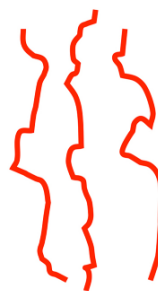


Fissures: grooves in the epidermis; corresponds to surface invaginations

Vessel structure



Curved



Serpentine/ irregular

Vessel arrangement



Linear



Branched/ Arborizing

FIGURE 2 Basic elements, descriptive terms and vessel patterns observed in neoplastic and non-neoplastic sebaceous lesions in dogs. Drawings made by the first author.

Image evaluation

A board-certified veterinary referral clinician under the supervision of a dermatological expert in dermoscopy reviewed all dermoscopic images and, applying the specific descriptive terminology and the additional descriptive terms, listed the dermoscopic features (10) variably observed in each of the sebaceous lesions (Figure 2).

Two board-certified veterinary referral clinicians and an ECVD resident independently examined all of the images and reported their evaluations in an Excel file that included a list of the 10 features. The three evaluators were asked to indicate the presence (1) or absence (0) of each of the 10 features for every image, and the completed forms were sent for statistical analysis.

The evaluations of the board-certified veterinary referral clinician with the most experience in dermoscopy, verified by a dermatological expert in dermoscopy, were used for correlation analysis to measure the strength of association of each parameter and type of sebaceous proliferation.

Histological examination

After dermoscopic examination and image acquisition, lesions were surgically excised and immediately fixed in 10% buffered formalin for 48–72 h. Samples were trimmed and routinely processed, embedded in paraffin, cut at 4 µm, stained with haematoxylin and eosin, and assessed independently by one ECVP board-certified pathologist and one ECVP third-year resident. Histopathological diagnoses were made following the morphological guidelines of Goldschmidt et al.,²⁴ and were considered as the gold standard diagnostic technique. Epidermal and dermal changes including hyperpigmentation of the epidermis and pigmentary incontinence in the dermis also were assessed. These parameters were scored as 0—absent, 1—minimal, 2—mild, 3—moderate and 4—severe. These lesions also were classified as focal, multifocal or diffuse.

Statistical analysis

Analysis of the agreement was made with the Cohen's Kappa calculation.

The agreement between the three evaluators was considered modest for kappa values k between 0.21 and 0.40, moderate for k between 0.41 and 0.60, and good for k between 0.61 and 0.80. For k -values >0.8 , there was a near-perfect degree of agreement between the evaluators.

The association between the type of sebaceous proliferation (histological diagnosis) and each dermoscopic feature considered was investigated with the Pearson's chi-squared test. The significance threshold was 0.05.

All analyses were performed with the software STATA 14.2. (Appendix S1).

RESULTS

A total of 34 lesions, 30 sebaceous hyperplasias (Figure 3), two sebaceous adenoma and two sebaceous epitheliomas were examined. Three of those lesions were mixed forms and were classified according to the main type of lesion found in percentage. Particularly, one sebaceous hyperplasia (composed of 70% sebaceous hyperplastic lobules and 30% adenoma), one sebaceous adenoma (composed of 80% adenoma and 20% sebaceous hyperplasia) and one sebaceous epithelioma (composed of epithelioma 65% and sebaceous hyperplasia 35% (Figure 4).

Dermoscopic features found in the lesions and the interobserver agreement are reported in Table 1. All additional descriptive terms proposed by the authors were variably present in the lesions.

In the majority of the lesions (91%), single or multiple, well-defined, white-yellowish, grouped ovoid clods were observed (Figures 3 and 5). Irregular linear and less commonly branching vessels were seen at the periphery of the clods in 93% of sebaceous hyperplasias (Figures 3 and 5) and in 50% of neoplastic lesions. Curved vessels were seen in only two sebaceous hyperplasias. Erosions were seen in 6.6% of sebaceous hyperplasias and in 50% of mixed forms (Figure 5). Brown/grey dots were present in 29.4% of the lesions.

Good interobserver agreement was found for white/yellowish clods ($k=0.75$), yellow scales ($k=0.83$), brown/grey dots ($k=0.80$), erosions ($k=0.82$) and red/brownish scales/crusts ($k=0.75$). Moderate agreement was achieved for fissures ($k=0.48$) and vessel-type arborising vessels ($k=0.51$) and irregular linear vessels ($k=0.53$).

Association between the dermoscopic parameters and type of sebaceous lesions was found for erosions and neoplastic lesions, and for blue/grey clods and multifocal hyperpigmentation.

DISCUSSION

To the best of the authors' knowledge, this is the first study describing dermoscopic findings of canine sebaceous hyperplasia and sebaceous skin neoplasias. We selected sebaceous lesions, in particular sebaceous hyperplasia, because these are common lesions in dogs that must be differentiated from other neoplasms particularly to warrant a conservative approach avoiding surgery. Thus, dermoscopic findings were assessed utilising histopathological examination as the gold standard diagnostic technique.

The descriptive terminology as reported by Rosendhal²³ was chosen as a reference for morphological analysis to establish the basis for sebaceous lesion description in dogs as well. Both metaphoric and descriptive language has been used in human dermoscopy. Metaphors are a special form of analogy, widely used in the human dermatology lexicon, that have been developed to aid the recognition and description of clinical and dermoscopic criteria. The term 'chrysalis structures' for example refer to shiny, bright white,

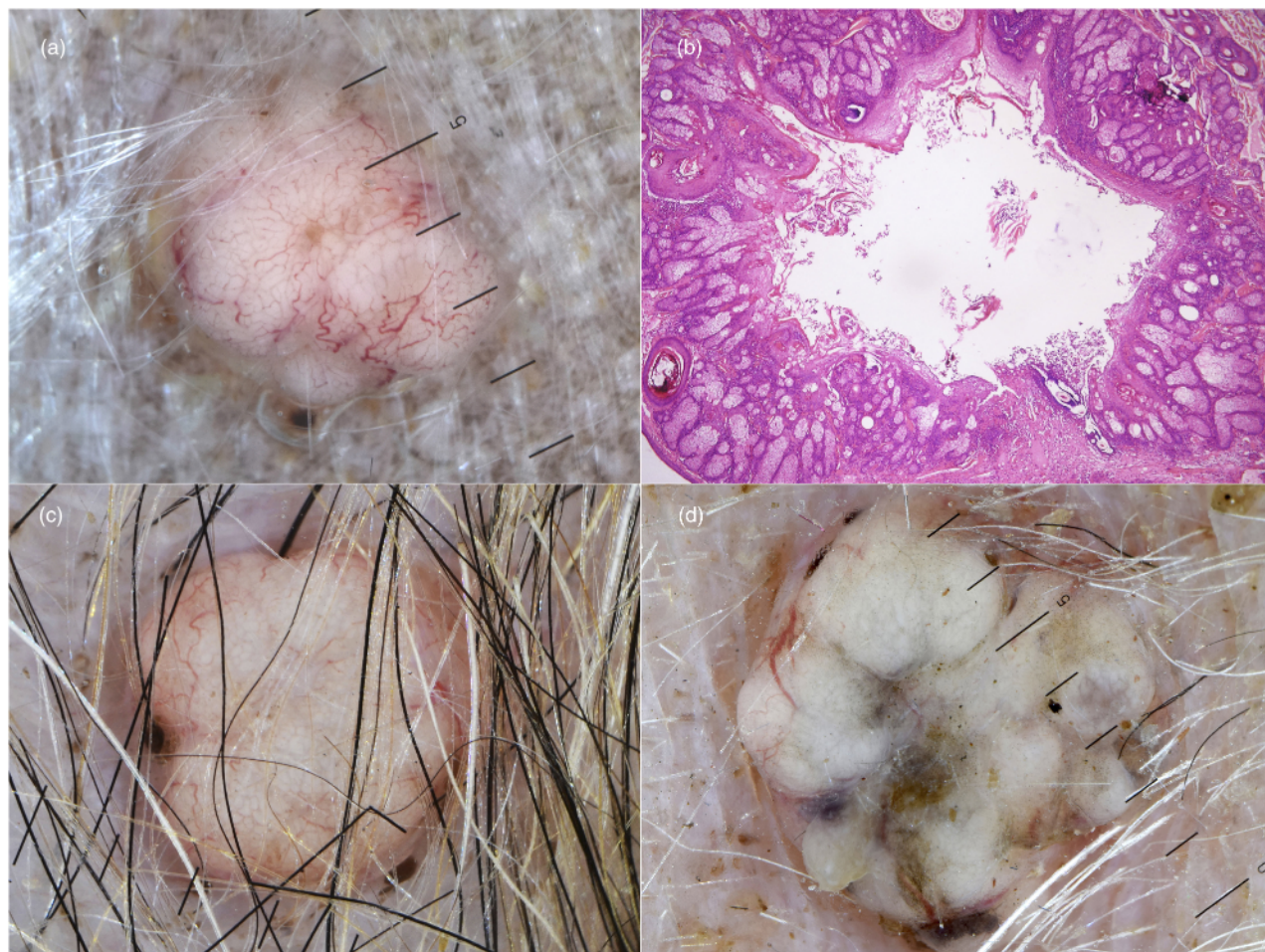


FIGURE 3 Dermoscopic findings in three cases of sebaceous hyperplasia. (a, c, d) Multiple, well-defined, white-yellowish, grouped, ovoid clods covering the entire surface are surrounded by irregular linear vessels at the periphery. (b) Histological findings for the lesion presented in (a); transversal section shows multiple enlarged sebaceous lobules corresponding to multiple grouped clods. Haematoxylin & eosin, $\times 10$.

orthogonal linear streaks observed with polarised-light dermoscopy in skin lesions with an increased amount of collagen. We opted for the descriptive terminology because it represents a more objective method of description and assessment of lesions, compared with the metaphoric language that lacks clear definitions, which might hinder the diagnostic repeatability of dermoscopy.

The main dermoscopic features observed in 91% of the lesions were white/yellowish clods and irregular linear vessels at the periphery of the lesions. These features are similar to those reported in humans^{5,6} and correspond to grouped dermal sebaceous lobules. In humans, the dermoscopic finding of yellow lobular-like structures has been described in sebaceous hyperplasia, sebaceous adenoma and nevus sebaceous of Jadassohn.⁵ Clusters of white-yellowish globules in the centre of the lesions and fine, nonarborising vessels (crown pattern) at the periphery are the hallmarks of these lesions.^{5,6}

Brown/grey dots and blue/grey clods (10 and two respectively) were observed in 12 lesions, all diagnosed as sebaceous hyperplasia. The association was found between blue/grey clods on dermoscopy and multifocal epidermal hyperpigmentation on histological examination. This might suggest that these features correspond

to melanin deposition in the skin, yet as the numbers are very small and this finding was very infrequent, we are unable to draw conclusions from these data.

Erosions and ulcerations were observed in four of 34 lesions; notably, two were sebaceous hyperplasia and two were mixed forms that, for analysis, were classified according to the predominant histopathological features and, thus, identified as one sebaceous epithelioma (65%) and one sebaceous adenoma (80%). Unlike what is reported in humans, where erosions and ulcerations are usually a sign of invasive growth and malignancy,²⁵ self-trauma is a common cause of erosion and ulcerations in dogs and thus, it should not be considered as significant in veterinary medicine.

The evaluation of vessels through dermoscopy plays a key role in the correct recognition of skin tumours, infections and inflammatory diseases in humans, and the correct interpretation of the features of vascular structures is among the most important steps in the diagnostic pathway.²⁶

Dermoscopic features of skin vessels in normal dogs have been reported by Zanna and co-workers.¹⁶ Authors described thin, arborising, red lines corresponding to vessels between follicular units visible at $\times 70$ magnification. In our study, irregular linear vessels, some of them arborising, representing dermal vessels

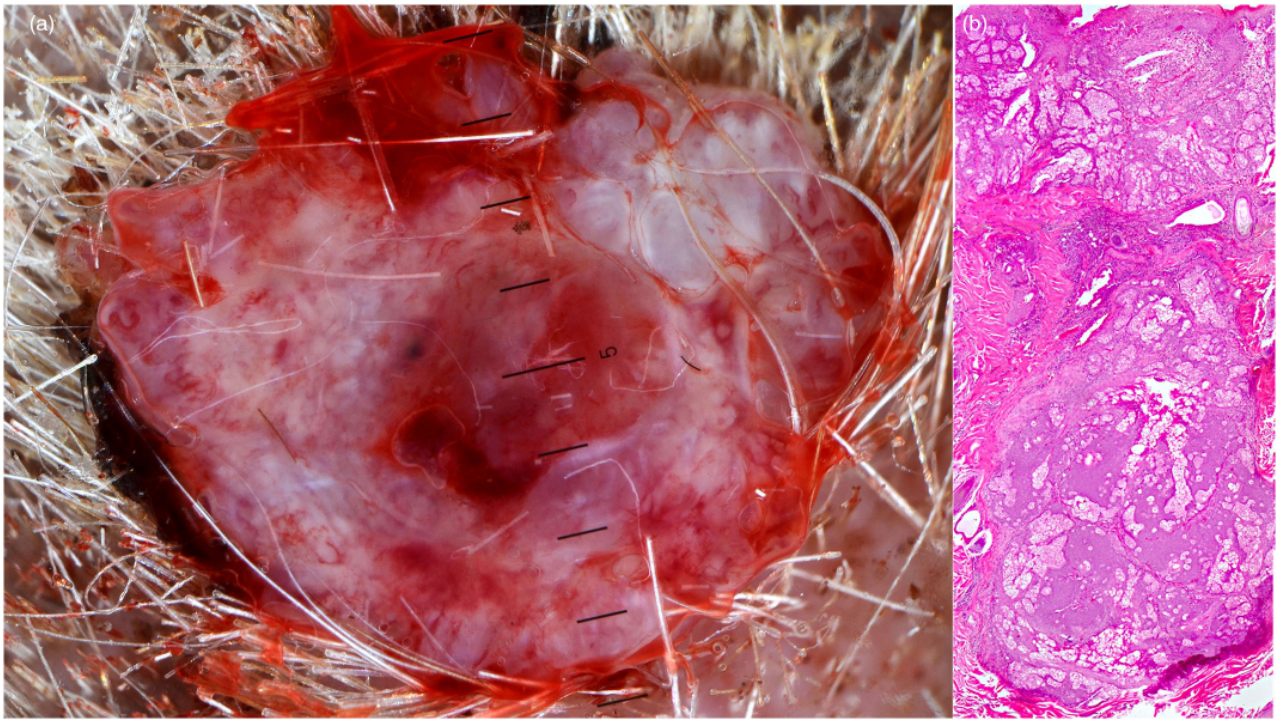


FIGURE 4 Dermoscopic findings in a mixed form (65% sebaceous epithelioma and 35% sebaceous hyperplasia). (a) Extensive ulceration and multiple, poorly defined white clods. (b) Histological findings for the lesion; transversal section shows multiple enlarged sebaceous lobules and a multiple, large irregular island of epithelial reserve cells. Haematoxylin & eosin, $\times 10$.

TABLE 1 List of dermoscopic features observed in the 34 neoplastic and non-neoplastic sebaceous lesions, with their presence expressed as percentages in lesions and agreement among the three observers on each dermoscopic feature.

Dermoscopic features	Sebaceous hyperplasia	Sebaceous adenoma	Sebaceous epithelioma	Total lesions	Agreement $k =$
White/yellowish clods	27 of 30 (90%)	2 of 2 (100%)	2 of 2 (100%)	31 of 34 (91.18%)	0.75
Fissures	13 of 30 (43.33%)	1 of 2 (50%)	1 of 2 (50%)	15 of 34 (44.12%)	0.48
Yellow scales	7 of 30 (23.33%)	–	1 of 2 (50%)	8 of 34 (23.53%)	0.83
Curved vessels	2 of 30 (6.66%)	–	–	2 of 34 (5.88%)	1.00
Linear irregular vessels	25 of 30 (83.33%)	1 of 2 (50%)	1 of 2 (50%)	27 of 34 (79.41%)	0.53
Arborising vessels	3 of 30 (10%)	–	–	3 of 34 (8.82%)	0.51
Brown/grey dots	10 of 30 (33.33%)	–	–	10 of 34 (29.41%)	0.80
Blue/grey clods	2 of 30 (6.66%)	–	–	2 of 34 (5.88%)	0.59
Erosions	2 of 30 (6.66%)	1 of 2 (50%)	1 of 2 (50%)	4 of 34 (11.76%)	0.82
Red/brownish scales/crusts	6 of 30 (20%)	1 of 2 (50%)	1 of 2 (50%)	8 of 34 (23.53%)	0.75

Cohen's kappa statistics: $k=0.41-0.61$ moderate agreement; $k=0.61-0.80$ good agreement; $k>0.80$ excellent agreement.

displaced by lobular-like structures, were clearly visible at $\times 10$ magnification.

This finding suggested that in dogs and humans, handheld dermoscopy allows visualisation of the type and architecture of vessels in the lesion, adding unique information that cannot be obtained by histological examination.

Good interobserver agreement was found for more than one dermoscopic feature. Regardless of their degree of experience, all observers recognised white/yellowish clods, yellow scales, brown/grey dots, erosions and red/brownish scales/crusts. Importantly, white/yellowish clods are features present in 91% of sebaceous lesions, suggesting that these also represent a useful and well-defined dermoscopic parameter in dogs.

Moderate agreement was found for vessel type. This finding is likely to have been related to the less experienced observers not being able to clearly identify vessel type and arrangement and suggests that specific training is needed to reach a good level of competence in dermoscopic evaluation.

We tried to determine whether dermoscopic features could suggest the nature of the sebaceous lesion. Unfortunately, no association between dermoscopic parameters and type of lesions was found except for the correlation between erosions and the diagnosis of neoplastic lesions. However, ulceration in dogs may be caused, as observed previously, by self-trauma and thus was not considered a finding as significant as it is in humans.

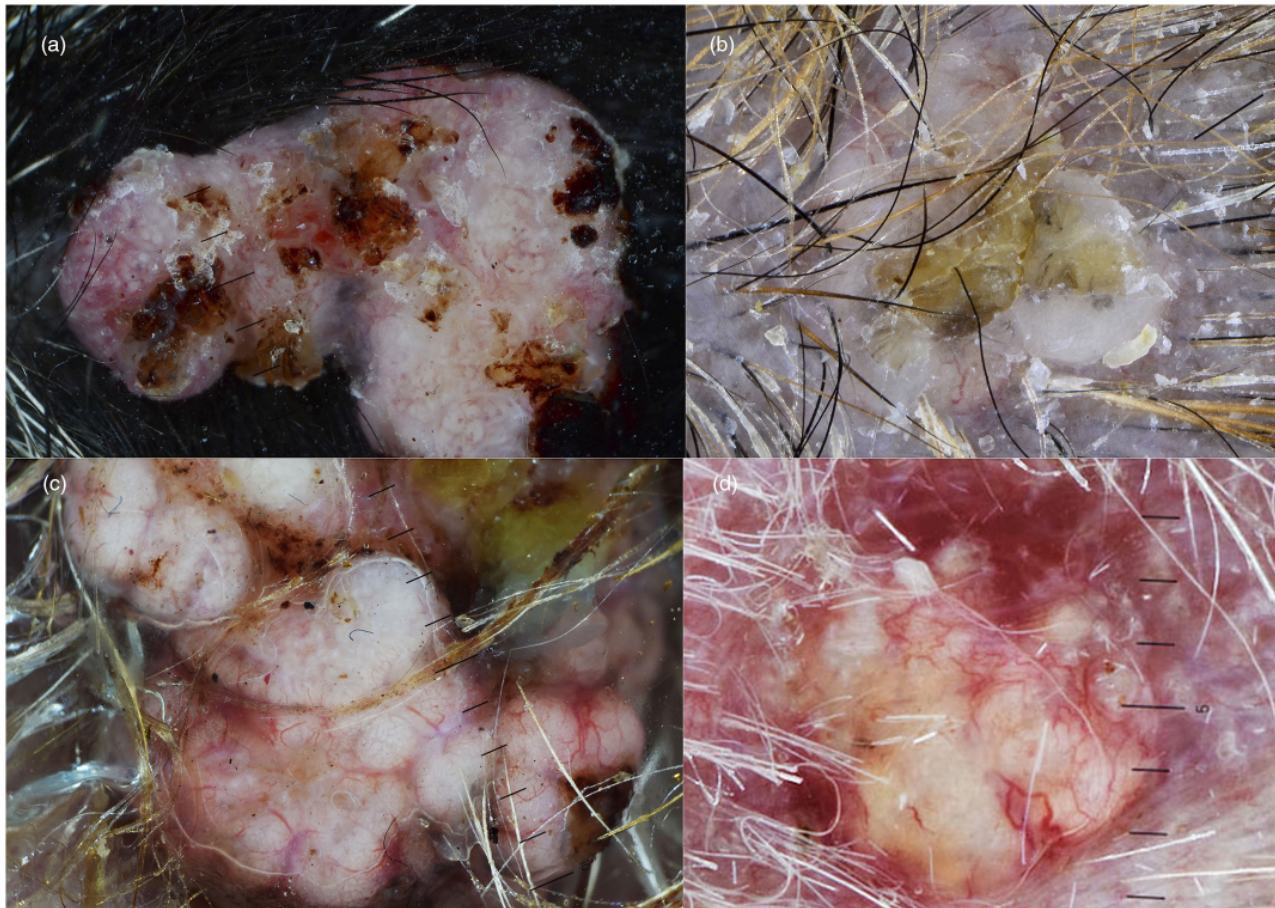


FIGURE 5 Dermoscopic findings in a mixed form (a) (80% sebaceous adenoma and 20% sebaceous hyperplasia) and three sebaceous hyperplasias (b–d). (a) Ulceration and red/brownish scales/crusts, (b,c) yellow scales, white-yellowish clods, and irregular linear vessels at the periphery of the lesions and (d) ulceration, white-yellowish clods and irregular linear vessels at the periphery.

It would be of interest in future to compare the dermoscopic features, particularly vessel type, and arrangement, of benign and malignant sebaceous neoplasms.

Cases included in the study were collected at one institution over a period of 5 years. Diagnoses were representative and mirrored the prevalence of canine cutaneous sebaceous lesions, with no sebaceous carcinomas included in the study, further highlighting how rare malignant forms are compared with benign forms.

Three mixed forms (two sebaceous hyperplasia and adenoma, and one sebaceous hyperplasia and epithelioma) were diagnosed. This suggests that, unlike in humans, sebaceous hyperplasia in dogs might be a precursor of sebaceous neoplasia such as adenoma, epithelioma or, more rarely, adenocarcinoma.

Notably, the larger and multilobular nodules included in this study were sebaceous epithelioma. Studies with a higher number of lesions are needed to assess whether tumour size is a helpful element in discriminating between sebaceous hyperplasia and neoplasia, and between benign and malignant forms.

CONCLUSIONS

To summarise, the most consistent dermoscopic features observed in canine benign sebaceous lesions

included single or multiple, well-defined, white-yellowish, grouped, ovoid clods and irregular linear vessels at the periphery of the lesion. Our results suggest that dermoscopy represents a useful and reproducible technique for diagnosing benign sebaceous proliferations, thereby reducing the need for biopsies.

AUTHOR CONTRIBUTIONS

Fabia Scarpella was involved in conceptualisation, investigation, writing—original draft, writing—review & editing and methodology. **Silvia Colombo** was involved in investigation and writing—original draft. **Alexandra Dehesa** was involved in investigation and conceptualisation. **Francesco Godizzi** was involved in investigation. **Stefano Cavicchini** was involved in conceptualisation and supervision. **Elisabetta Fabbri** was involved in methodology, software and data curation. **Paola Roccabianca** was involved in investigation, writing—original draft and writing—review & editing.

FUNDING INFORMATION

This study was self-funded.

CONFLICT OF INTEREST STATEMENT

No conflicts of interest have been declared.

ORCID

Scarampella Fabia  <https://orcid.org/0000-0002-4581-7263>

Colombo Silvia  <https://orcid.org/0000-0003-1138-4364>

Roccabianca Paola  <https://orcid.org/0000-0002-3672-4612>

REFERENCES

- Micali G, Lacarrubba F, Massimino D, Schwartz RA. Dermoscopy: alternative uses in daily clinical practice. *J Am Acad Dermatol*. 2011;64:1135–46.
- Braun RP, Scape A, Marghoob AA. The “blink sign” in dermoscopy. *Arch Dermatol*. 2011;147:520.
- Zalaudek I, Argenziano G, Di Stefani A, Ferrara G, Marghoob AA, Hofmann-Wellenhof R, et al. Dermatoscopy in general dermatology. *Dermatology*. 2006;212:7–18.
- Wolner ZJ, Yélamos O, Liopyris K, Rogers T, Marchetti MA, Marghoob AA. Enhancing skin cancer diagnosis with dermoscopy. *Dermatol Clin*. 2017;35:417–37.
- Zaballos P, Ara M, Puig S, Malvey J. Dermoscopy of sebaceous hyperplasia. *Arch Dermatol*. 2005;141:808.
- Zaballos P, Gómez-Martín I, Martín JM, Bañuls J. Dermoscopy of adnexal tumors. *Dermatol Clin*. 2018;36:397–412.
- Oztas P, Polat M, Oztas M, Alli N, Ustun H. Bonbon toffee sign: a new dermoscopic feature for sebaceous hyperplasia. *J Eur Acad Dermatol Venereol*. 2008;22:1200–2.
- Kim NH, Zell DS, Kolm IK, Olivero M, Rabinovitz HS. The dermoscopic differential diagnosis of yellow lobular like structures. *Arch Dermatol*. 2008;144:962.
- Goldschmidt MH, Shofer FS. Skin tumors of the dog and cat. Oxford: Pergamon Press; 1992. p. 3–62.
- Withrow SJ, Vail DM. Surgical oncology. Withrow and MacEwen's small animal clinical oncology. 4th ed. St Louis, MO: Saunders Elsevier; 2007. p. 386–7.
- Gross TL, Ihrke PJ, Walder EJ, et al. Sebaceous tumors. Skin diseases of the dog and cat, clinical and histopathologic diagnosis. 2nd ed. Oxford: Blackwell Publishing; 2005. p. 641–50.
- Graf R, Pospischil A, Guscetti F, Meier D, Welle M, Dettwiler M. Cutaneous tumors in Swiss dogs: retrospective data from the Swiss canine cancer registry, 2008–2013. *Vet Pathol*. 2018;55:809–20.
- Zanna G, Auriemma E, Arrighi S, Attanasi A, Zini E, Scarampella F. Dermoscopic evaluation of skin in healthy cats. *Vet Dermatol*. 2015;26(14–7):e3–e4.
- Legnani S, Zini E, Roccabianca P, Funicello B, Zanna G. Dermoscopic analysis of the skin of healthy warmblood horses: a descriptive study of 34 cases in Italy. *Vet Dermatol*. 2018;29:165–e61.
- Scarampella F, Fabbri E, Zanna G. Dermoscopic features in 35 dogs with juvenile-onset demodicosis and 35 breed- and age-matched dogs: an observational descriptive study. *Vet Dermatol*. 2014;25:385.
- Zanna G, Roccabianca P, Zini E, Legnani S, Scarampella F, Arrighi S, et al. The usefulness of dermoscopy in canine pattern alopecia: a descriptive study. *Vet Dermatol*. 2017;28:161–e34.
- Scarampella F, Roccabianca P. Alopecia areata in a dog: clinical, dermoscopic and histological features. *Skin Appendage Disord*. 2018;4:112–7.
- Scarampella F, Zanna G, Peano A, Fabbri E, Tosti A. Dermoscopic features in 12 cats with dermatophytosis and in 12 cats with self-induced alopecia due to other causes: an observational descriptive study. *Vet Dermatol*. 2015;26:282–e63.
- Dong C, Angus J, Scarampella F, Neradilek M. Evaluation of dermoscopy in the diagnosis of naturally occurring dermatophytosis in cats. *Vet Dermatol*. 2016;27:275–e65.
- Scarampella F, Zanna G, Peano A. Dermoscopic features in canine dermatophytosis: some preliminary observations. *Vet Dermatol*. 2017;28:255–6.
- Legnani S, Buckley L. The use of dermoscopy to support the diagnosis of sarcoptic mange in two dogs. *Vet Dermatol*. 2022;33:255–e67.
- Legnani S, Abramo F, Zanna G, Graziano L, Corneigliani L, Roccabianca P. Acral congenital superficial dermal lymphatic malformations in two unrelated cats: clinicopathological, dermoscopic and ultrastructural findings. *Vet Dermatol*. 2020;31:309–e77.
- Rosendahl C, Cameron A, McColl I, Wilkinson D. Dermatoscopy in routine practice—‘chaos and clues’. *Aust Fam Physician*. 2012;41:482–7.
- Goldschmidt MH, Munday JS, Scruggs JL, Klopffleisch R, Kiupel M. Sebaceous and modified sebaceous gland tumors. In: Kuppel M, editor. Surgical pathology of domestic animals. volume 1: Epithelial tumors of the skin. Gurnee, IL: Davis-Thompson Foundation; 2018. p. 125–49.
- Rosendahl C, Cameron A, Tschandl P, Bulinska A, Zalaudek I, Kittler H. Prediction without pigment: a decision algorithm for non-pigmented skin malignancy. *Dermatol Pract Concept*. 2014;4:59–66.
- Argenziano G, Zalaudek I, Corona R, Sera F, Cicale L, Petrillo G, et al. Vascular structures in skin tumors: a dermoscopic study. *Arch Dermatol*. 2004;140:1485–9.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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Résumé

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Resumen

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Zusammenfassung

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