Focal cutaneous telangiectasia in a young dog of probable congenital origin

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Abstract  
Background: Idiopathic cutaneous telangiectasia has been rarely described in the dog.  
Objectives: We present the first case of idiopathic focal cutaneous telangiectasia in a young dog of probable congenital origin.  
Methods: An 18-month-old spayed female Maltese dog presented with demarcated erythema of the skin on the right thorax. The lesion consisted of scattered, florid, ramified macules with mild dermatrophia and desquamation. The lesion was examined with histopathology and immunohistochemistry using antibodies for alfa-SMA.  
Results: Diascopy revealed a blanchable lesion. Tortuous capillary expansion was observed by dermoscopy. The histopathological examination revealed dilated but otherwise unremarkable capillaries in the superficial dermis compatible with cutaneous telangiectasia. The lesion was followed up over a 3-year period and had essentially remained stable. Other vascular anomalies displaying similarities with telangiectasia are discussed.  
Conclusions: In human vascular anomalies, this case would be presumably classified as ‘telangiectasia’ by the International Society for the Study of Vascular Anomalies. We propose that primary cutaneous telangiectasia should be included in the list of differential diagnoses for this type of lesions in dogs. We also suggest that dermoscopy would be a valuable tool for the identification of vascular anomalies in dogs.

KEYWORDS  
capillary, congenital disorder, dermatology, dermoscopy, dog, skin, vascular anomaly

1 | INTRODUCTION

Cutaneous vascular anomalies form a heterogeneous disease group that would be categorised into tumours and malformations in human medicine according to clinical and biological criteria (Calonje et al., 2015; Dompmartin et al., 2015; Goldsmith et al., 2015; ISSVA, 2018).

A new classification (International Society for the Study of Vascular Anomalies [ISSVA], 2018) for human vascular anomalies has been proposed in 2018 by the ISSVA. The ISSVA ontology has been created to represent a sharable semantic data model of the ISSVA classification. Cutaneous vascular anomalies in dogs include cutaneous haemangiomas, haemangiosarcomas, lymphangiomas, lymphangiomatosis,
lymphangiosarcomas, angiomatosis, telangiectasias and vascular naevi or hamartomas (Gross et al., 2005). Telangiectasia is defined as permanent dilation of pre-existing blood vessels, creating small focal lesions, usually in the skin or mucous membranes. In the dog, telangiectasia may appear as a cutaneous feature of canine hyperadrenocorticism. Additionally, Demanuelle et al. (1999) described chronic cutaneous telangiectasia in an old dog without an apparent underlying cause. Herein we present the first case of a young dog with idiopathic cutaneous telangiectasia. The nomenclature and classification for cutaneous telangiectasia in dogs were reviewed, and the case was discussed in relation to the classification for human vascular anomalies.

2 | CASE REPORT

2.1 | Case history

An 18-month-old spayed female Maltese dog presented with demarcated erythema of the skin on the right thorax (Figure 1a). The lesion was first noticed 2 months prior to presentation and remained stable throughout the follow-up period. The owner was unsure when the lesion appeared because they had not paid careful attention to see the skin under the hair coat. The lesion consisted of scattered, florid, ramified macules (Figure 1b), with mild dermatrophia and desquamation. The dog was otherwise healthy and there was no history of using drugs including flea and tick prevention treatments.

2.2 | Diagnostic procedure

Clinical differential diagnoses included capillary haemangiomas, cutaneous vascular naevi, telangiectasia, cutaneous angiomatosis and secondary phenomena related to circulatory, coagulation, and endocrine disorders. Diascopy revealed a blanchable lesion. Dermoscopy was performed with Derma 9500 (Derma Medical Inc., Yokohama, Japan) combined with a PowerShot A630 camera (Canon Inc., Tokyo, Japan). The capillaries demonstrated a reticular appearance, and those in the superficial dermis showed dilation, different sizes and irregular linear or tortuous patterns in magnified views (Figure 2). In contrast, the healthy skin did not show an erythematous colour change, and the capillaries appeared as thin red lines. Skin biopsy was performed with a 6-mm biopsy punch under local anaesthesia; bleeding and purpura were not observed at either site after biopsy. Histopathological examination of the lesion revealed focal moderate dilation of the congested capillaries at the superficial dermis (Figure 3a). In addition, some of the vessels in the lower dermis and subcutaneous adipose tissue were mildly dilated. The dilated capillaries were lined by a single layer of uniform endothelial cells (Figure 3b). There were no obvious morphological abnormalities such as atypia or mitoses. In a biopsy of the healthy skin from over the left shoulder, capillary dilation was not observed. We performed Elastica van Gieson (EVG) staining, which showed as expected that the small, dilated capillaries lacked intimal elastic membrane (Figure 3c). Immunohistochemical staining using antibodies for alfa-SMA (Mouse Monoclonal Antibody, Clone
FIGURE 3  Histopathological features of the lesion. (a) Note focal, moderate dilation of the congested capillaries within the superficial dermis, and some of the capillaries in the lower dermis and subcutaneous adipose tissue are also dilated. Haematoxylin-eosin staining, 4x magnification. Bar = 500 μm. (b) The dilated capillaries in the superficial dermis are lined by a single layer of uniform endothelial cells, and there are no obvious morphological abnormalities such as atypia or mitoses. Haematoxylin-eosin staining, 100x magnification. Bar = 100 μm. (c) The small, dilated capillaries within the dermis lack intimal elastic membrane. Elastica van Gieson staining, 100x magnification. (d) Immunohistochemical staining of the lesional skin using antibodies for alfa-SMA. The dilated vessels were surrounded by few positive cells (100x magnification).

1A4, 1:5000, SIGMA, USA) was also performed. It was shown that the dilated vessels, similar to the normal ones in the not affected skin, were surrounded by few positive cells interpreted as the pericytes (Figure 3d) (Alarcon-Martinez et al. 2018; Nehls V et al, 1993). Based on the clinical and histopathological findings, an idiopathic cutaneous telangiectasia was diagnosed.

2.3 | Treatment and outcome
The lesion was followed up over 3 years by regular medical checks without any treatments. The margin of the lesion expanded slightly, and the vasodilation appeared to be mildly accentuated (Figure 4). However, the morphological pattern and distribution of lesions remained essentially the same as that of the original presentation, and the general condition was good during the follow-up period.

3 | DISCUSSION
We present a young dog with focal cutaneous telangiectasia based on clinical (including dermatoscopy) and histological features. Telangiectasia is defined as the permanent dilatation of pre-existing blood vessels, creating small focal lesions, usually in the skin or mucous membranes (Demauel et al., 1999; Goldsmith et al., 2015). In this case, capillary haemangiomas, cutaneous vascular naevi, cutaneous angiomatosis and telangiectasias were clinically considered as the major clinical differential diagnosis. Capillary haemangiomas are typically blue to purple elevated lesions, characterised by the proliferation of blood-filled vascular spaces lined with a single layer of well-differentiated endothelial cells (Dompmartin et al. 2015; Gross et al. 2005). Cutaneous vascular naevi occur on the scrotum (synonyms: scrotal vascular hamartomas) and occasionally elsewhere in dogs (Muller et al., 2012; Sugai et al., 1998; Trappler et al., 2014). The
lesions at the scrotum are characterised by single or multiple, slowly
enlarging, hyperpigmented plaques (Trappler et al., 2014). Another
report revealed a pink, red or purple flat lesion of variable size at
the shoulder (Sugai et al., 1998). Histopathologically, the naevus
and hamartoma are characterised by cavernous dilation and proliferation
of blood vessels without atypia in the endothelial cells (Müller et al.,
2012; Sugai et al., 1998; Trappler et al., 2014). Cutaneous angiomato-
sis manifests as dark red macules and patches, or may present as
multiple plaques and nodules, and a tendency towards progression,
including enlargement and invasion of the lesions (Affolter et al., 2004;
Gross et al., 2005; Ide et al., 2013; Kim et al., 2005; Kuroki et al.,
2010; Laganga et al., 2018; Olivieri et al., 2010; Peavy et al., 2001;
Sluiter et al., 2013; Yager et al., 2010). Histopathologically, an infla-
tation pattern with well-differentiated blood vessels extending into
the underlying subcutaneous layers, can be observed. Two dogs with
early age of onset angiomatosis, which did not show significant pro-
gression, were observed (Kim et al., 2005; Olivieri et al., 2010); both
cases showed swelling or expanding lesions, and the histopathologi-
cal examinations revealed an infiltrative pattern of well-differentiated
blood vessels in the superficial and deep dermis extending to the under-
lying subcutis. This case demonstrated non-progressive focal dilation
of capillaries at the superficial dermis, with lack of proliferation, inflam-
mation and bleeding. The case is not suggestive of haemangioma,
aeves and/or angiomatosis, as there was no apparent proliferation or
malformation of the affected capillaries.

It is suspected that the lesion appeared during the neonatal peri-
dods due to a non-progressive nature in the dog. Primary telangiectasias
have a good prognosis, with the exception of aesthetic considera-
tions (Goldsmith et al., 2015; Kucuk et al., 2021; Villela-Segura, 2019).
Cutaneous telangiectasia in dogs has been associated with Cushing’s
syndrome (Gross et al., 2005). As far as we know, there is only one
published case with two areas of telangiectasia involving the right and
left antebrachia in dogs (Demanuelle et al., 1999). The dog received
anti-inflammatory dosed glucocorticoids due to an allergic dermatitis
only in the summer months for 7 years, but did not have them since a
year before the skin lesion appeared. The cause of the telangiectasia
in this dog could not be determined. There were no clinical or clini-
copathological findings suggesting Cushing’s syndrome in the present
dog.

Primary telangiectasia is included in the capillary malformation
I category of simple human vascular malformations in the ISSVA
(2018). Several subtypes of telangiectasia have been discussed, and
some of them may be reclassified in the future. Congenital unilat-
eral naevoid telangiectasia (UNT) is presumably involved in the ISSVA
(2018) (Calonje et al., 2015; Goldsmith et al., 2015; Cossio et al.,
2018; Kucuk et al., 2021). It presents at birth or shortly after neonatal
periods and is characterised by clustered telangiectasia with a reticular
appearance that blanches with diascopy. Histopathologically, numer-
ous dilated vessels are observed in the upper and middle dermis and,
to a lesser extent, in the deeper part of the dermis in UNT. In our case,
the rather young age of presentation of the lesion in our case
may suggest a congenital disorder, and the clinical and histopatho-
logical findings were similar to those of UNT. Dermoscopy showed a
reticulated appearance with tortuous vessels, which suggested dilated
capillaries in the superficial layer of the dermis; these findings were
also similar to the dermoscopic findings of UNT (Kucuk et al., 2021;
Villela-Segura, 2019). Although dermoscopy is a useful non-invasive
tool for the examination of vascular lesions in humans, there are no
reports on its use in animals for examining vascular lesions (Dong et al.,
2016; Genovese et al., 2014; Scarampella et al., 2015, 2017; Tomich
et al., 2018; Zanna et al., 2015, 2017). Despite anatomical differences
in blood vessels of the skin between humans and dogs, we speculate
that dermoscopy could be a valuable diagnostic tool for the identifica-
tion and examination of vascular anomalies in dogs. Further studies are
warranted to evaluate the usefulness of dermoscopic findings and the
similarities of vascular anomalies including telangiectasia in humans
and dogs; its utility in the development of a classification for canine
vascular anomalies also requires further investigation.

4 | CONCLUSION

This report describes the first young dog with idiopathic cutaneous
telangiectasia that may resemble UNT in humans and may have a con-
genital origin. Dermoscopy was found to be a valuable tool for the ex-
amination of the vascular lesions in this case, and it may be applied
for other vascular anomalies in dogs in the future.

AUTHOR CONTRIBUTIONS

Ueyama, Akira: data curation; formal analysis; writing – original draft.
Hoshino, Tomoya: formal analysis; supervision; writing – review &
editing. Asakawa, Midori Goto: formal analysis; supervision; visualisa-
tion; writing – review & editing. Shimada, Toshio: resources; writing –
review & editing. Nagata, Masahiko: conceptualisation; data curation;
formal analysis; methodology; resources; supervision; validation;
visualisation; writing – original draft; writing – review & editing.
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CONFLICT OF INTEREST
The authors have no conflicts of interest to declare.

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DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ETHICAL STATEMENT
The authors confirm that the ethical policies of the journal, as noted on the journal’s author guidelines page, have been adhered to. No ethical approval was required as this is a retrospective case report with no original research data.

STUDY PRESENTATION
This case report was presented at the 2019 meeting of the Japanese Society of Veterinary Dermatology.

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