CASE REPORT

Livedoid eruption in a patient affected by T- $\gamma\delta$ large granular lymphocyte leukaemia

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SUMMARY

Livedo is an ischaemic dermopathy characterised by a reddish-blue to violaceous mottling of the skin with a net-like reticular appearance. Livedo has been described in association with several medical conditions including lymphoproliferative disorders. Here, we describe the case of a 60-year-old woman who was presented with asymptomatic and persistent livedoid eruption on her trunk, lower and upper extremities as manifestation of an indolent form of T- $\gamma\delta$ large granular lymphocyte leukaemia. To the best of our knowledge, this is the first report describing the association between livedo reticularis and T- $\gamma\delta$ large granular lymphocyte leukaemia. It is plausible that a pathogenetic role of the neoplastic process is based on a cytotoxic antiendothelial activity.

BACKGROUND

Livedo is an ischaemic dermopathy characterised by a reddish-blue to violaceous mottling of the skin with a net-like reticular appearance.^{1,2} This condition may result from any process that causes venodilatation of vessels and deoxygenation of venous blood, thus increasing the visibility of the dermal venous plexus.¹ Main causes of venodilatation include local hypoxia, altered autonomic nervous system function and circulating venodilators.

Deoxygenation is mainly caused by reduced cutaneous perfusion, which can arise from decreased arteriolar inflow (vasospasm caused by cold, increased blood viscosity, autonomic input or arterial thrombosis) or increased resistance to venous outflow (venous thrombosis and increased blood viscosity).³

Livedo has already been described in association with several medical conditions including lymphoproliferative disorders.^{1,3}

Here, we describe the case of a 60-year-old woman who presented with livedoid eruption as manifestation of an indolent form of T- $\gamma\delta$ large granular lymphocyte leukaemia (T- $\gamma\delta$ LGLL).

CASE PRESENTATION

A 60-year-old woman affected by an indolent form of T- $\gamma\delta$ LGLL was referred to our Dermatology Unit for a violaceous reticular mottling involving almost all the entire cutaneous surface (figures 1–3). Physical examination showed regular and relatively uniform violaceous

conical rings symmetrically distributed on her trunk, lower and upper extremities. The patient reported that skin lesions were asymptomatic and had been present for 3 months, with no modification due to temperature or posture changes. No other cutaneous abnormalities, such as nodules, macules, ulcerations or atrophic blanche type scarring, were detected. Furthermore, oral and genital mucosa and cutaneous annexes showed no involvement. The patient denied any traumatism or topical drugs application on the involved areas. Thus, clinical presentation suggested a diagnosis of livedo reticularis (LR). Her medical history revealed concurrent rheumatoid arthritis, neutropenia and severe haemolytic anaemia.

INVESTIGATIONS

Laboratory tests showed negative antiphospholipid antibody panel and cryoglobulins. Upper and lower extremity Doppler ultrasound and a cardiac echo were performed to exclude the presence of venous thromboembolic diseases as a cause of LR. Although skin biopsies from both the peripheral erythematous and central whitish areas are useful in determining the various causes of LR, notably a vasculitis, a vasculopathy or a normal tissue, a skin biopsy was not performed since the patient denied her consent.

DIFFERENTIAL DIAGNOSIS

The differential diagnoses of LR includes erythema ab igne, cutis marmorata telangiectatica congenital, reticulated erythematous mucinosis and poikiloderma with a reticulate pattern associated with mycosis fungoides, dermatomyositis, or graft versus host disease. An accurate history and specific clinical features may suggest the diagnosis.

TREATMENT

The undergoing therapy included filgrastim, prednisone, sulfamethoxazole/trimethoprim, deferasirox, pantoprazole and valganciclovir.

We adopted no specific dermatologic therapy, as a medical treatment for primary LR is not necessary and treatment should be directed towards the underlying disorder.

OUTCOME AND FOLLOW-UP

At 3-month follow-up visit, cutaneous lesions remained unchanged despite variation in some

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Figure 1 Reticular lesions of erythematous-bluish colour and lacy aspect on lower limbs.

haematological parameters (ie, decreased platelets, erythrocytes and lymphocytes).

DISCUSSION

LR has already been described in association with several medical conditions: autoimmune diseases, vessel wall diseases and vasculitis, infections, neurological disorders, endocrinological disorders, solid neoplasms and haematological disorders.^{1,3} Haematological conditions associated with a livedoid pattern include cryopathies, myeloproliferative syndromes, pernicious anaemia, disseminated intravascular coagulation, multiple myeloma, lymphoma and leukaemia.¹

Few cases of lymphoproliferative disorders associated with LR have been reported, notably one case of acute lymphocytic leukaemia and some cases of chronic natural killer (NK) cell lymphocytosis.³⁻⁵ Chronic NK cell lymphocytosis is included in the group of large granular lymphocytes (LGL) diseases, which indicate a spectrum of clonal expansions of LGL that can arise either from T cell or NK cell lineages, delineating,

Figure 2 Livedo reticularis at the upper back.

Figure 3 Livedo reticularis at the neck/upper chest as well as the upper limbs.

therefore, two different families of LGL leukaemia (LGL): T-LGL and NK-LGL.⁶ The T-subtype is further divided into $\alpha\beta$ (mainly CD4–CD8+) and $\gamma\delta$ (mainly CD4–CD8– or CD4–CD8+) T-LGL.⁴ The biological behaviour of both T-LGL and NK-LGL forms can range from indolent courses with a good prognosis to aggressive forms with a lower survival rate.⁷

The association between LR and LGL has already been described for the indolent chronic form of NK-LGL,^{4,5} and it is plausible that the pathogenetic mechanism behind the development of LR could be similar for the two subtypes. To this regard, both T and NK forms of LGL present an abnormal expression of NK activation receptors that could be responsible for the vascular damage underlying the development of LR.⁴ Furthermore, both these lymphoproliferative disorders secrete cytokines and growth factors, such as tumour necrosis factor alpha and gamma interferon, interfering with endothelial proliferation and adhesion and showing a cytotoxic activity against endothelial cells.⁶ Although venous thrombosis is considered among the main causes of LR, in our case this mechanism seems less realistic because the livedoid cutaneous pattern of our patient was homogeneously diffused on all her skin surface.³ In addition, since the cutaneous situation was stable and presented no modifications according to haematological variations (decreased platelets, erythrocytes and lymphocytes), we may exclude the hypothesis of an increased blood viscosity as LR etiopathogenetic factor. Finally, considering that this livedoid eruption appeared only after the onset of the LGL and considering the physiopathology of this skin disorder, we suggest that this case of LR was not incidental or idiopathic but was strictly associated with the concomitant hematologic disorder.

In conclusion, this is the first report of association between LR and T- $\gamma\delta$ -LGL. We propose a pathogenetic explanation based on a cytotoxic antiendothelial activity which deserves further substantiation.

Learning points

- Livedo is an ischaemic dermatopathy characterised by a reddish-blue to violaceous mottling of the skin with a net-like reticular appearance.
- Livedo has been described in association with several systemic diseases including lymphoproliferative disorders.
- This is the first report of livedo associated with T- large granular lymphocyte leukaemia.

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Competing interests None declared.

Patient consent Obtained.

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