

## CASE REPORT

# Concurrent pulmonary embolism in female monozygotic twins affected by Dercum's disease

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## Abstract

We describe a pair of female monozygotic twins with Dercum's disease (DD) who presented simultaneously with unprovoked pulmonary emboli. Several genetic determinants have been associated with venous thromboembolism (VTE) but the overall influence of genetic factors is unknown. As yet there is no published evidence to support an increase in the risk of VTE in female monozygotic twins. DD is a rare condition characterized by multiple, painful lipomas. The underlying pathology of it is poorly understood. To date, there has been no recorded association with an increased risk of VTE but there have been reports of stroke-like events. It is unclear if these are caused by the condition itself or are co-incidental. We acknowledge the possibility of a coincidence but the two cases raise the question of an association between VTE and DD. This report should encourage further studies into the risk of VTE in female monozygotic twins and DD.

## INTRODUCTION

Venous thromboembolism (VTE) encompasses a group of conditions that, amongst others, include deep vein thrombosis (DVT) and pulmonary embolism (PE). It is a multifactorial disease, the result of interactions between environmental and hereditary factors [1, 2]. Although it has been demonstrated that several genes are involved in this condition, their full impact on the risk to develop VTE has as yet not been fully understood [3].

Male monozygous twins have an increased risk of VTE if the other twin had suffered such an event. No such correlation has so far been found in female identical twins [4].

DD (also known as Adipositas dolorosa) is a rare condition that is characterized by obesity and painful adipose deposits in the

subcutaneous tissue of the extremities and other parts of the body. Whilst numerous rare clinical conditions are known to be associated with an increased risk of VTE, such as Prader–Willi syndrome [5], DD, has never been reported as being one of those conditions [6].

We report a case of two female monozygotic twins, both affected by DD, presenting at the same time with multiple unprovoked pulmonary emboli.

## CASE REPORT

### TWIN 1

A 67-year-old woman presented with shortness of breath on exertion of 4 months duration. No other symptoms were

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revealed by direct questioning. There had been no recent travelling, immobility or other intercurrent illness. She gave a past history of rheumatic fever in childhood and of Dercum's disease (DD). The latter was diagnosed more than a decade earlier after she had presented over years with recurrent painful lipomas, based on her personal and family history and after surgical excision and histological examination of one. Clinical examination revealed multiple lipomas consistent with her underlying chronic condition. The cardiovascular, respiratory, gastrointestinal and neurological examination was otherwise normal. CXR was unremarkable. D-Dimer was elevated at 3100 ng/mL and VQ SPECT scanning revealed multiple pulmonary emboli (Fig. 1). Outpatient investigations looking to identify an underlying cause were unyielding (see Table 1 for a summary of results).

**TWIN 2**

Three weeks later, the patient's identical twin was admitted with a 6-month history of gradually worsening shortness of breath on exertion. The recent admission of her sister with symptoms which mirrored her own had prompted the patient to seek medical advice. The patient was otherwise well but also had a diagnosis of Dercum's disease which was made after her twin had been diagnosed. Again, there was no recent travelling, immobility or intercurrent acute illness. Aside from multiple lipomas in line with her past medical history, the physical examination was unremarkable. Again, her CXR was normal and D-Dimer was elevated. VQ SPECT scanning demonstrated multiple pulmonary emboli (Fig. 2). Further investigations were

performed as an outpatient which also were unyielding (see Table 1). The patient herself had identified a lipoma in the right groin and had raised the suspicion of a pressure effect on the underlying vasculature in this area. In an ultrasound scan, the abdominal and pelvic organs appeared normal with no evidence of lesions at any site. No lipoma was identified in the right groin at the site indicated by the patient. The right femoral vein appeared normal.

**DISCUSSION**

VTE is a spectrum of diseases that include DVT and PE. In case of a DVT, a venous thrombus forms, most frequently in the deep veins of the lower limbs. If a piece of clot breaks off and circulates through the bloodstream, it can reach the lungs and provoke an occlusion of the pulmonary circulation. This event, referred to as PE, may be fatal if a massive occlusion of the pulmonary artery occurs [2].

Hereditary and environmental risk factors, classified by Virchow into three categories in 1856, the Virchow's triad, (alterations in the blood flow, changes in the constitution of blood and changes in the vessel wall) [7], contribute to the VTE pathogenesis [1, 2]. Several genes are involved in this condition, but their overall influence on VTE remains unknown. A retrospective study conducted on 26 982 patients of the Danish Twin Registry demonstrated differences in genetic susceptibility to VTE between the sexes. According to their results, genetic factors seem to play a substantially stronger role in males than in females, being responsible for an increased risk of VTE in male monozygotic twins but not in females [4].

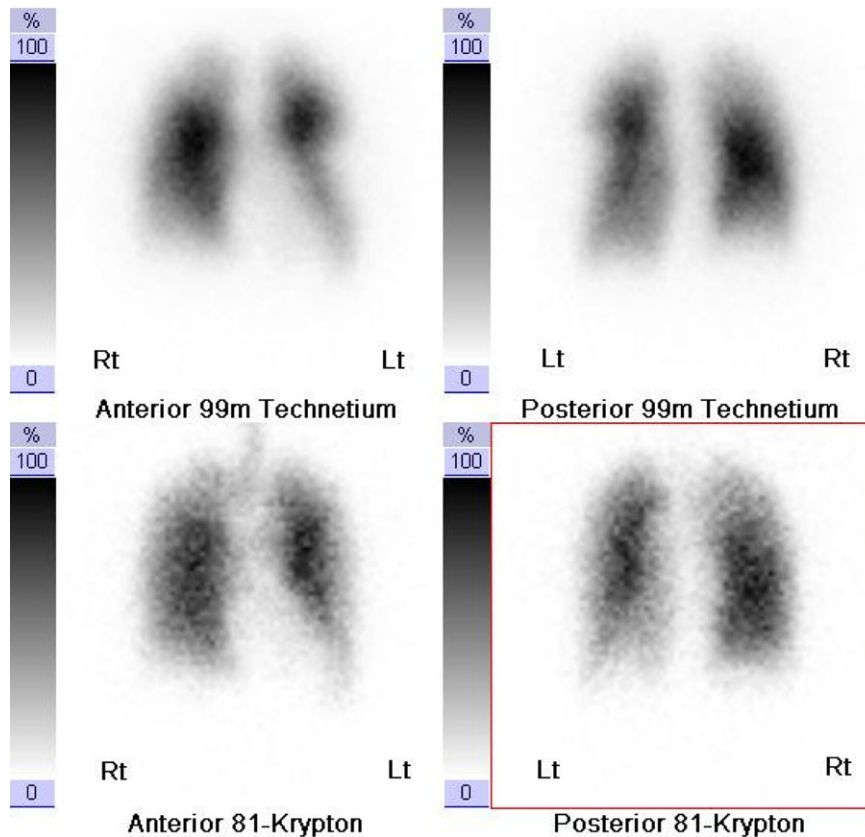


Figure 1: VQ SPECT Twin 1.

Table 1: Summary of results

	Twin 1	Twin 2
Symptoms	Shortness of breath on exertion	Shortness of breath on exertion
Duration of symptoms at presentation	4 months	6 months (5 weeks prior to twin 1)
D-Dimer	3100 ng/mL	985 ng/mL
Troponin T	Negative	Negative
Transthoracic Echo	Good LV systolic contractility with mild diastolic dysfunction Mild/Mod TR RVSP 66–70 mmHg No cardiac lipomas Repeat scan 3 months later showed normal RVSP	Good LV function Mild MR Mild TR Normal RVSP No cardiac lipomas
VQ SPECT	Multiple focal perfusion defects reflecting multiple pulmonary emboli (Fig. 1)	Large mismatched defect in left mid-zone and multiple pulmonary emboli (Fig. 2)
Full Thrombophilia Screen		Normal (done in primary care prior to diagnosis after her sister was diagnosed)
Anti-cardiolipin antibodies	Not detected	See above
Lupus anticoagulant	Not detected	See above
APCR	Normal	See above
CEA, CA19.9, CA125, AFP	Normal	
Ultrasound scan	Normal abdominal and pelvic scan, normal lower limb venous doppler	Normal abdominal and pelvic scan, normal lower limb venous Doppler

TR, tricuspid regurgitation; MR, mitral regurgitation; RVSP, right ventricular systolic pressure.

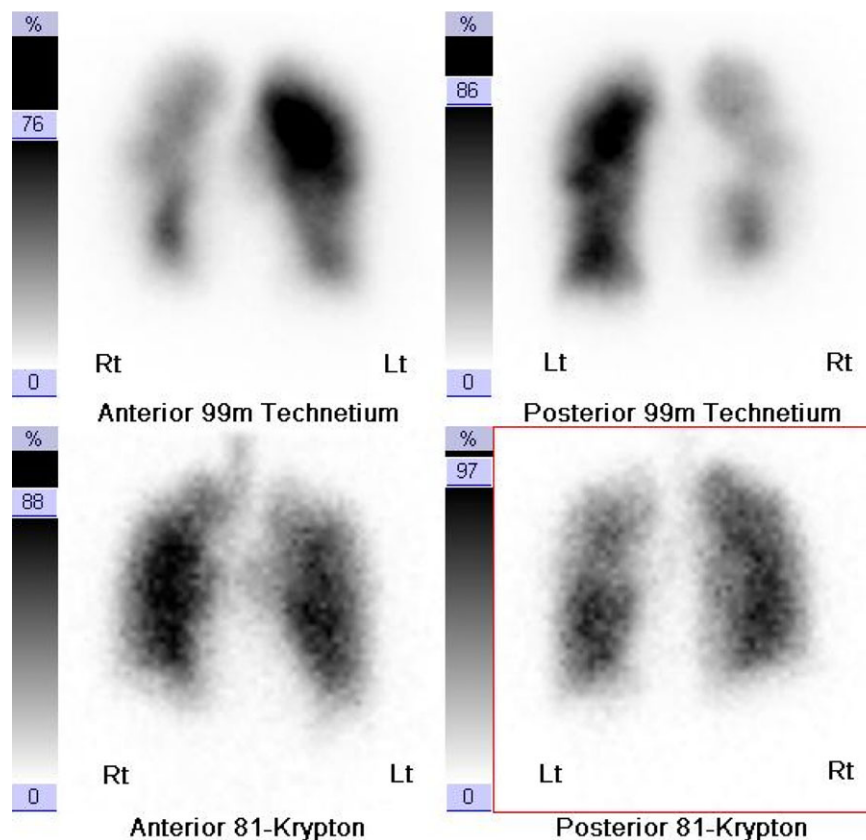


Figure 2: VQ SPECT Twin 2.

In this context, a case of female twins who develop symptoms of an unprovoked VTE concurrently represents an extremely rare event. Investigations including blood tests for

thrombophilia and underlying malignancy, along with radiological imaging looking for evidence of a mechanical cause of DVT secondary to venous compression revealed no underlying

cause. The twins were both affected by DD which is a rare disorder resulting in painful fatty deposits around the upper legs, trunk and upper arms. Little is known about the pathological mechanisms of this condition, although it is suspected that there is either a metabolic or autoimmune component involved [8]. An increased risk amongst family members has been described [9]. There is no proven association of the disease with an increased risk of VTE or with a thrombophilic status. Few reports, however, have described stroke-like events in DD with no evidence of ischaemic lesions on MRI scan of the brain [10, 11]. We questioned whether the multiple lipomas seen in DD could increase the likelihood of DVT formation through a direct mechanical effect causing deep venous compression, which was not confirmed on ultrasound scans in our patients, or whether a possible cause of DVT has to be attributed to an inflammatory aetiology of the disease proposed by some authors [6]. Inflammation and consequent necrosis of adipocytes could be a predisposing factor for lipohyalinotic and microatheromatous degeneration of the small cerebral vessels, responsible for the stroke-like events but may also be involved in the DVT formation.

In conclusion, this case is of clinical interest due to the improbability of a pair of two female monozygous twins presenting at the same time with unprovoked pulmonary emboli. To our knowledge, no such case has been described in the literature before. We strongly believe that our experience should raise questions of associations between VTE and DD but also encourage further studies amongst female monozygous twins into the risk of VTE.

## ACKNOWLEDGEMENTS

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## CONFLICT OF INTEREST STATEMENT

None declared.

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