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Co-Existence of Chronic Venous Insufficiency in Patients with Lymphedema – an Under Diagnosed Entity

KEYWORDS: chronic venous insufficiency, lymphedema, phlebolymphedema

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ABSTRACT *Objective: The aim of this study is to understand the prevalence of venous disorders in patients who present with lymphedema and comment on the pattern of venous insufficiency.*
Methods: Between March 2012 to December 2015, all patients with a clinical diagnosis of lymphedema underwent a confirmatory lymphoscintigram followed by a venous duplex of the affected limb. The presence or absence of venous disease was confirmed. Standard statistical methods were used in the analysis.
Results: During the study period, 106 patients underwent lymphoscintigraphy. 54 of these patients had concomitant venous pathology as confirmed by duplex. Of these, the most common type of venous abnormality seen was perforator incompetence (76%). Junctional incompetence was seen in 50% and deep vein reflux [DVR] in 16%..
Conclusions: There is significant presence of concomitant venous disease in patients with primary lymphedema. The question of whether to treat the venous pathology needs more evidence.

Introduction
The swollen leg is a common problem in a wound clinic. The treatment and management of lymphedema and its associated complications including ulceration is an essential part of any good wound care service.

Lymphedema is usually classified into primary and secondary types. Primary lymphatic dysfunction is both idiopathic and congenital in origin. These patients can present with lymphedema at any age. Most commonly, we see young middle aged men or women with leg swelling which are frequently diagnosed as lymphedema. Infection leading to cellulitis, parasites, surgery or radiation may damage lymphatic structures leading to secondary lymphedema. In India, filariasis is the most common cause of secondary lymphedema[1].

It is well known that in patients with advanced chronic venous disease (CVD), almost 20% to 30% will have lymphatic dysfunction. This is attributed to overload or as a result of secondary cellulitis. This form of lymphedema is called phlebolymphedema [2]. On the contrary, very little is known of the prevalance of venous disorders in patients with primary lymphedema. We have tried to answer this question and also describe the pattern of venous insufficiency present in these patients

Nucleotide scintigraphy is often used for diagnosis in patients with lymphedema. However, this method of diagnosis does not differentiate between primary and secondary lymphedema as delayed uptake and absence of node visualisation can happen in either case [3, 4, 5]. Duplex imaging is the most common method used to evaluate venous disease but it is insensitive to iliac vein lesion with routine techniques [6]. Intravenous ultrasound is more definitive but because of costs involved, it is not a part of our routine practise. As a result of the present practices and lack of treatment options, a large number of young patients, in the prime of their life, are confined to lifelong compression therapy and physiotherapy [7].

Materials and Methods
During a 3 year period (2012-2015), patients with symptoms and signs suggestive of lymphedema first underwent isotope lymphoscintigraphy to confirm the diagnosis. Standard protocol was followed on our institution. Technetium 99 M sulfur colloid was injected intra dermally and subcutaneously into the first web space. Images of the lower limb and pelvis were acquired with a gamma camera at 5, 10, 20, 30, and 60 minutes. Patients were asked to walk before the injection and between the images. The temporal progression of activity up the limb and the appearance of isotope activity in the inguinal and pelvic nodes at these time intervals were the basis for interpreting abnormal lymph activity. Other abnormalities of local lymph flow, such as pooling, were also recorded. The images were interpreted as normal when rapid flow progressed up the limb symmetrically with the opposite limb and nodes were rapidly visualized. When normal, nodal activity was visible as early as 10 minutes and well developed by 20 minutes. When nodal visualization was faint or delayed beyond 30 minutes, lymphatic activity was considered abnormal and reduced. When nodal visualization failed to occur at 60 minutes, lymphatic activity was interpreted as being absent. However, both reduced and absent node visualization was interpreted as abnormal lymphoscintigraphy. The lymphoscintigraphic data were collected from reports by the interpreting radiologist not involved in the study.

These patients were also subjected to duplex imaging of the superficial and deep venous system. All duplex examinations were done with a 7 – 12 hz probe by trained radiologists, with adequate experience who were not a part of the study. In the duplex ultrasound, deep veins were assessed for patency and reflux in the common femoral

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vein and popliteal vein. The junctions were assessed for reflux (terminal valve/ pre-terminal valve) in the sapheno femoral junction (SFJ) and sapheno popliteal junction (SPJ). The main trunks were assessed for diameter and reflux (in the saphenous compartment) in the great saphenous vein (GSV), anterior accessory saphenous vein (AASV), posterior accessory saphenous vein (PASV) small saphenous vein (SSV) and thigh extension of SSV/Giacomini vein. The tributaries if incompetent were documented. The perforating veins were assessed for diameter and reflux.

Results

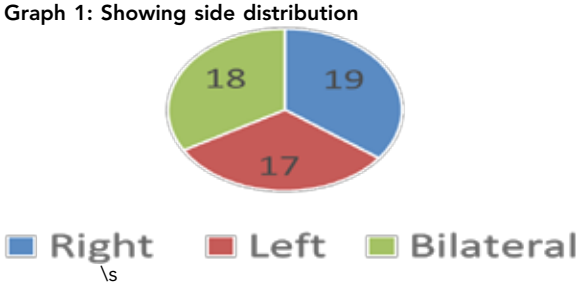
There were a total number of 106 patients who had undergone evaluation with lymphoscintigraphy for lymphedema in the study period (2012 – 2015). In this group, there were 100 patients who had abnormal scintigraphy and diagnosed to have lymphedema. All of these patients underwent a duplex ultrasound. Of these, 54 patients had associated venous disease. The demography and pattern of venous disease in these 54 patients was studied in greater detail.

There were 31 men and 23 women in the study population. Almost half the patients were in the middle age group (Table 1). Majority of these patients were diagnosed to have primary lymphedema.. One third of the patients have involvement of both lower limbs (Graph 1)

Table 1: Age distribution

Age	18-30 yrs	30-50 yrs	>50 yrs
No.	10 (18%)	25 (46%)	19 (35%)

Graph 1: Showing side distribution



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Across all age groups, the most common duplex abnormality found was perforator incompetence (76%, Table 2). However, there were a significant number of patients with junctional incompetence (50%). Most of these patients were middle aged (Table 3).The prevalence of DVR was 16%. The most common side to be affected with perforator incompetence was the right however SFJ incompetence was almost equally distributed between the right, left and bilateral (Table 4).

Table 2: Type of duplex abnormality

Type of duplex abnormality	Number	Percentage
Perforator	41	76%
SFJ	21	39%
SPJ	6	11%
DVR	9	16%

Table 3: Age distribution with associated duplex abnormality

	Perforator	SFJ	SPJ	DVR
18-30 yrs	6	4	3	3
30-50yrs	19	8	3	5
>50 yrs	16	9	0	1

Table 4: Side association with type of duplex abnormality

	Perforator	SFJ	SPJ	DVR
Bilateral	13	6	3	2
Right	16	7	0	3
Left	12	8	3	4

Discussion

Limb swelling, although common, can be a diagnostic dilemma. One of the commonest causes of unilateral limb swelling in India is lymphedema. In India, filariasis is often the diagnosis made for secondary lymphedema. However, we see a good number of young men and women who present with lymphedema of unknown etiology. This type of lymphedema is referred to as lymphedema praecox. Many of these patients have co-existing venous insufficiency that is often undiagnosed.

In our study we observed that the co existence of venous disease in patients diagnosed to have primary lymphedema was around 54%. Majority of the patients who presented with lymphedema were in the 30-50 yrs age group. The prevalence of phlebolymphedema in western literature in around 20 -30% [6]. The higher percentage of venous disease seen in our study group is probably related to the high percentage of perforator incompetence. This age group lies within the limits of the productive working age group as described by the World Bank [8]. . Living with lymphedema at this age may prove to be a significant disability and pursuing treatment options may prove to be a debilitating expense.

The presence of perforator incompetence has been shown to increase the clinical severity of chronic venous insufficiency [9]. However, its role in the pathogenesis of lymphedema has not been studied. We suggest that the transport failure that occurs in lymphatic disease builds up a back pressure which is reflected at the capillary level and also mostly at the perforator level. The perforators play an important role in reduction of ambulatory venous pressure and more often the first line of defence. The loss of perforator competence is followed by junctional valvular incompetence.

The presence of DVR in a 9 patients suggests the deep veins may also be involved in the pathogenesis of lymphedema. The presence of deep vein reflux may not be secondary to transport failure at a micro lymphatic level. A non-thrombotic iliac vein lesion (NIVL) may be permissive under such circumstances and aggravate symptoms. However, duplex assessment is insensitive to iliac vein lesions and ascending phlebography is poorly sensitive [10]. Intravenous ultrasound has been proven to be a valuable tool in the diagnosis and management of iliac vein lesions and has been described to reverse the abnormal scintigraphy following stent placement across the offending lesion [11].

In conclusion, as the options in the treatment of primary lymphedema are limited, modern endovascular and minimally invasive methods of treatment of venous insufficiency make it prudent to look closely at the presence of venous insufficiency in these patients. Investigating the venous system in patients diagnosed to have primary lymphedema offers a novel option in the treatment of lymphedema.

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