

## Life after Breast Cancer: Dealing with Lymphoedema

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### Abstract

**Background:** In recent years, breast cancer (BC) mortality rates have declined, reflecting advances in early detection. Prevention and management of treatment sequelae that could impair function or quality of life have increased in relevance. Lymphoedema after BC treatment is one of these sequelae. It is caused by an acquired interruption or damage to the axillary lymphatic system and it is characterized by an abnormal accumulation of fluids and other substances in the tissue.

**Purpose:** We observed a group of patients with incidents of BC aiming to estimate the lymphoedema incidence, degree, time course, symptoms and treatment they received.

**Methods and results:** We evaluated 127 women. Median age was 58 years. 66% were postmenopausal. The median number of axillary nodes was 9. Over the first five years of follow-up we were informed about hand/arm swelling, thickness or tiredness by 37% of this group. The median of axillary nodes affected by metastatic cells in our patients with lymphoedema was 6. The symptoms they referred to us as the most relevant were heaviness (33%), tiredness (27%), jewelry or clothing too tight (25%), swelling and indentations (9%) and difficulty writing (6%). Several of them had psychological problems.

**Conclusion:** We know of the relevance of lymphoedema in BC patients but its natural history and most effective therapies are poorly understood. Self-reported symptoms are relevant to promptly start therapy.

**Keywords:** lymphoedema, breast cancer survivors, arm oedema, breast cancer surgery, axillary dissection

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## Introduction

In recent years, breast cancer (BC) mortality rates have declined,<sup>1</sup> reflecting advances in early detection. Recently, the proportion of newly diagnosed women who have stage 0 or very favorable stage I BC have increased. Consequently many women diagnosed with BC can expect survival that is similar to age-matched women without BC as a result of improvements in diagnosis methods and effective adjuvant therapies.<sup>2</sup> The number of BC survivors has also substantially increased.<sup>3</sup>

As a result of these two points, prevention and management of treatment sequelae that could impair function or quality of life have acquired increased relevance.

Upper limb edema after BC surgery or radiation therapy is one of these sequelae,<sup>1,4,5</sup> and is one of the most feared long-term complications. This is called lymphoedema and is due to an acquired interruption or damage to the axillary lymphatic system after locoregional treatment for BC<sup>6</sup> and is characterized by an abnormal accumulation of fluids and other substances in the tissue.<sup>7</sup>

Lymphoedema can cause profound adverse effects on BC survivors' quality of life.<sup>8</sup>

It causes physical discomfort, disfigurement, swelling, pain, loss of sensation and functional impairment.<sup>6</sup> It can also cause anxiety, depression and emotional distress affecting social relationships and undermining body image.<sup>1</sup>

The reported incidence rates of this complication range from 0% to 70% according to several series depending on how the condition was defined and measured and also how long the patients were followed and observed.<sup>9,10</sup>

These inconsistencies in measuring and defining the complication remain barriers to research and documentation.

After axillary lymph node dissection the incidence of lymphoedema is about 23%–38% if the criterion used to identify it is a greater than 2 cm increase in upper arm circumference measured at two adjacent points compared with the circumferences of the other arm.<sup>11–13</sup> But professionals have highlighted the relevance of patient self-reporting which is a parameter increasingly used alone or combined with arm measurement to study lymphoedema.<sup>11</sup>

Usually there is a substantial delay between the initial treatment of BC and clinical appearance of

lymphoedema,<sup>12</sup> although its physiopathological onset is quick after treatment, but without clinical translation. Thereafter the chronically swollen limb may remain relatively stable for several years.<sup>12</sup> In most cases it develops to be clinically visible within 3 years after treatment<sup>11</sup> although most occur within the first 2 years.

There are consistent risk factors for the development of this complication such as obesity, lack of mobility, post-operative wound infection, radiotherapy to the axilla, full axillary nodes dissection, post-surgical drainage time and chemotherapy.<sup>13–20</sup>

One of the most important points to note is the lack of awareness of the condition by women at risk. A number of efforts have to be made to reduce the risk of secondary lymphoedema by pre-operative and post-operative counseling and education and by early detection.<sup>21,22</sup>

A randomised clinical trial on the prevention of secondary lymphoedema through exercises and an educational strategy, however lacked sufficient evidence to support use of this strategy.<sup>23</sup>

The study by Lacomba et al showed that early physiotherapy could be an effective intervention to prevent secondary lymphoedema in women for at least one year after surgery for BC and dissection of axillary lymph nodes.<sup>6</sup>

Lymphoedema remains a problem even with modern treatment modalities.<sup>24,25</sup> With the introduction of sentinel lymph node biopsy for axillary staging, it was assumed that this procedure would be associated with minimal morbidity as compared with full axillary node dissection.<sup>26</sup> But several studies have indicated that sentinel lymph node dissection does indeed reduce but not eliminate the risk of lymphoedema.<sup>27,28</sup>

With this controversial topic we decided to observe a group of patients with incident BC diagnosed in the second half of 2004 and in 2005 at our institution and followed over 5 years. We attempted to estimate the subjective incidence of lymphoedema, its degree, time course, symptoms and treatment our patients received.

## Methods

### Study population

After institutional review board approvals, we prospectively recruited patients with first diagnosis of histologically confirmed invasive primary BC.



All eligible women were older than 18 years and physically and mentally capable of taking a clinical interview and reporting symptoms by themselves. All of them have undergone an axillary dissection as a part of their initial treatment.

We excluded patients with stage IV disease. All these women had been previously informed about the risk of lymphoedema and they were advised to consult in case of any symptoms on their upper limbs even if they were not related to swelling. All of them were informed before surgery by a surgeon and an oncologist. They received information about every symptom they could present and about the impact these symptoms could have in their lives. The severity of this condition was identified by the patients in a subjective manner, according to the impact it had in their lives as mild, moderate or severe.

We aimed to record the first symptom they complained about and the rest of parameters presented above.

With this objective we considered lymphoedema in every case the patient reported of heaviness, swelling or tiredness that appeared after surgery. The inconsistencies in defining this complication remain a barrier to increasing the knowledge we have about lymphoedema after BC, so we tried to identify and measure the incidence of the symptomatic condition as they were referred subjectively by our patients.

This cohort of patients were visited by a doctor every six months and if they referred symptoms they were visited whenever they needed.

## Data analysis

Each woman's follow-up period started on the date they underwent surgery with axillary dissection and we considered the date in which they complained as the moment of first event appearance.

We have presented the data in a descriptive way. The data were collected by a doctor.

## Results

We evaluated 127 women diagnosed with BC in our institution over the second half of 2004 and the whole year 2005. Median age was 58 years old (range between 28 to 79 years) being 66% postmenopausal.

The median number of axillary nodes analysed was 9 (ranging between 4 and 17). 62% of them received

adjuvant chemotherapy and 72% were treated with radiotherapy.

Over the first five years of follow-up we were informed about hand/arm swelling, thickness or tiredness by 37% of the group. 13% noticed it after the surgery was performed and the rest recognized it after the second or third year.

The majority of patients with lymphoedema according our definition noticed changes in their symptoms and signs throughout the day reporting more intense swelling or disturbances at night. Exclusively in eight cases we were informed about this complication once they presented the whole arm with oedema without fluctuation throughout the day.

The median quantity of axillary nodes affected by metastatic cells in our patients with lymphoedema was 6 (ranging between 0–10).

The symptoms they referred to us as the most relevant were heaviness (33%), tiredness (27%), jewelry or clothing too tight (25%), swelling and indentations (9%) and difficulty writing (6%).

For each symptom noticed, patients subjectively indicated the severity and level of associated distress and functional impairment.

67% of women reported symptoms as mild, 25% as moderate and the rest as very severe. On the other hand, most of these patients had some kind of depression or discouragement, mainly patients with severe lymphoedema and arm function impairment with difficulties to perform daily activities or in case of cosmetic deterioration.

After being informed about the appearance of this complication we sent the patients for evaluation by an occupational therapist. Women experiencing moderate or severe lymphoedema were more likely to be treated than those with only mild lymphoedema. Among treated patients the majority received graded compression garments to deliver pressures to the affected arm. Others were advised to perform some form of exercise, to receive massages or to elevate the arm.

All of them were taught to protect their arms to avoid cuts, burns, bites and cannulae, to treat minor wounds promptly to avoid infection and to avoid pressure around the arm from blood pressure tourniquets and tight clothing and to avoid carrying heavy loads.

Patients who reported some degree of discouragement were advised to visit a psychologist. In three



cases the patients needed to visit a psychiatric clinic for anti-depressive treatment.

After the treatment commenced all of them reported clinical improvement in their physical changes, locoregional symptoms and emotional or distress problems.

## Discussion

Lymphoedema represents potentially the most debilitating complication after nodal axillary surgical dissection in patients diagnosed with BC.<sup>29</sup>

Due to the lack of a standardized definition of lymphoedema, we do not know its true incidence and it can be difficult to determine.<sup>30</sup> Previous studies have found rates of lymphoedema of 0% to 70% depending on how the condition was defined or how long the sample was followed.<sup>9,10,31</sup> Although volume displacement techniques are recognized as the gold standard in assessing this complication, this technique can be cumbersome in a busy clinical setting. This is the reason why the majority of clinical series have used circumferential measurements of the upper arm and forearm as surrogate markers for volume change.<sup>32–34</sup> However those measurements may be unrealistic for all studies evaluating lymphoedema rates after BC treatment, and therefore a common agreement on terminology is relevant. Many authors have developed a validated self-administered questionnaire that correlates well with these measurements.<sup>35</sup> But others have found different definitions and measurements of lymphoedema which were not equivalent.<sup>36</sup> On the other hand they have suggested that self-reporting of signs and symptoms might not be as good as using an objective definition of a 2 cm increase in arm circumference<sup>37</sup> as the contrary has been demonstrated by another study.<sup>38</sup> A recent study also demonstrated that differences in self-reported arm size and symptoms can be early signs of progressing lymphoedema.<sup>39</sup> This is the reason for our use of self-reported symptoms to evaluate the symptoms reported by patients who underwent BC surgery.

As a conclusion, the problem associated with the objective measurements has been the necessity of baseline data to precisely determine changes in arm size which is not always possible in a clinical setting. In such cases the patients who referred subjective limb symptoms must be referred to a physical therapist.<sup>40</sup>

As we have shown above, in our study the majority of symptomatic patients after BC therapy reported a feeling of arm heaviness followed by arm tiredness and jewelry or clothing being too tight. These symptoms have to be considered as the early manifestation of subtle lymphoedema and they lead us to send these patients to a physical therapist to begin a fluid management treatment quickly.

The importance of mild lymphoedema is becoming clearer.<sup>41,42</sup> Although lymphoedema is a common sequelae of BC, most lymphoedemas are mild. The wide range of reported incidences reflects the difference among studies' end-points measured.

Recent prospective studies have shown 3-year rates of lymphoedema varying from 15% to 54%.<sup>41,43</sup> The first two studies<sup>43,44</sup> used circumferential measurements and the third and fourth studies assessed arm swelling by self-report.<sup>41,45</sup> Our finding of a 37% incidence of this complication after 3 years falls within this range of estimates.

Our results confirm the finding that most of the cases with lymphoedema are mild, and also demonstrate that multiple symptoms are associated with subtle lymphoedema, such as jewelry being too tight.

Only by observing a well-described and enumerated group of women over time we can obtain accurate estimates of cumulative incidence or risk as well as progression and regression of this condition.

This prospective population-based study has addressed incidence, degree, and time course of lymphoedema in BC survivors who report symptoms by themselves.

Subtle differences in self-reported arm/hand size can be early signs of progressing lymphoedema. Whether prompt treatment when symptoms appear might help to avoid any kind of objective lymphoedema and whether progression from mild to moderate/severe lymphoedema could be slowed with earlier detection and treatment merit further investigation.

Although we know several risk factors which influence the development of lymphoedema we have not evaluated these in our study.

In the study by Yen et al they have found that removal of more than five lymph nodes and presence of lymph node metastases were independent predictors of developing lymphoedema. Our study showed that the median number of lymph nodes examined was 9, meanwhile the median number of nodes





affected among patients with lymphoedema was 6 being similar to the ones indicated above.

Recently, the sentinel lymph node biopsy have resulted in significantly less frequent lymphoedema than axillary lymph node dissection.<sup>46</sup> At a median of 5 years after this procedure, 5% of women will develop lymphoedema although this proportion will continue to increase with time because data related to lymphoedema after axillary dissection suggest that the large majority of those who will ultimately develop it have done so by 5 years.<sup>21</sup> As a conclusion, although this technique has certainly reduced the morbidity associated with axillary staging for BC, there remains a small but significant risk of lymphoedema.

Finally, and due to psychological morbidity associated with lymphoedema, psychosocial issues should be promptly recognized and addressed. Women with lymphoedema have shown to have greater psychiatric morbidity and functional disability and so they will experience a deterioration in their quality of life.<sup>46</sup> Our study has shown that patients who reported some kind of discouragement were encouraged to promptly visit a psychologist and in three cases the patients visited a psychiatric clinic to start an anti-depressive treatment. All these case showed an improvement in their anxiety problems.

Although we know the relevance of lymphoedema in BC patients, its natural history and most effective therapies have been poorly understood and need further study. Accurate assessment requires agreement on a standardized and reliable system of measurement. Randomized controlled trials to answer these questions should be encouraged.

## Disclosure

This manuscript has been read and approved by all authors. This paper is unique and is not under consideration by any other publication and has not been published elsewhere. The authors and peer reviewers of this paper report no conflicts of interest. The authors confirm that they have permission to reproduce any copyrighted material.

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