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Incidence of clinically significant lymphoedema as a complication following surgery for primary operable breast cancer

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Abstract

There has recently been considerable interest for the need for specialist lymphoedema nurses to be appointed in the NHS. However, we had noticed in our cancer follow-up clinics that the incidence of lymphoedema appeared to be very low. Treatment for primary breast cancer (>5cm) has been surgery and low axillary sampling (ANS). Radiotherapy (RT) or axillary clearance is subsequently performed in patients found to be node positive. The patients are followed-up in the primary breast cancer (PBC) clinic weekly. Follow-up is initially at 3-month intervals up to 2 years and then 1 yearly indefinitely. We conducted a two phased study in patients being followed up in our post cancer clinic in order to identify the incidence of LE in these patients. Phase 1 involved symptomatic patients identified at routine follow up in a 15-week period and the number of patients reporting arm swelling was recorded. The aim of this was to provide an estimate to power a phase 2 study (prospective questionnaire based). Phase 2 was conducted over a 13-week period. All patients attending the clinic were administered modified FACT B4, EQ-50 and Speilberger questionnaires. A total of 1242 patients were examined and lymphoedema found in 5 (0.04%). Of these 5, 3 had undergone axillary clearance, 1 ANS plus radiotherapy and only 1 had ANS alone. A policy of ANS, with prophylactic treatment for lymph node positivity either by surgery or RT alone, gives a very low rate of lymphoedema.

Keywords: Breast cancer; Lymphoedema; Quality of life; Axillary clearance; Radiotherapy

1. Introduction

Improvements in the life expectancy of women diagnosed with breast cancer has led to a greater emphasis on the quality of life (QoL) of patients. Lymphoedema (LE) of the arm, secondary to axillary prophylaxis, can cause significant functional impairment, psychological morbidity and thereby decreased QoL. It has been shown that patients with LE develop anxiety, depression and emotional distress more commonly than those without the condition [1–3]. Velanovich and colleagues also showed that the psychological distress and pain experienced by these patients adversely affects their QoL [4].

Axillary lymph node status is an important factor in prognosis. Although lymph node sampling (ANS) may be used to determine this, surgical clearance of the axilla for both prognostic information and axillary prophylaxis remains the operative procedure of choice in many centres, especially in mainland Europe, even though ANS has been shown to be as effective as clearance in the determination of lymph node staging [5].

It is widely quoted that approximately one quarter of patients who have undergone clearance develop LE [6]. Especially high rates have been reported after clearance combined with radiotherapy [7,8]. Kissin and colleagues using limb volume measurements found LE present in 25% of a cohort of 200 patients overall and 38% in those who underwent an axillary dissection plus radiotherapy [7]. However, the use of physical measurements has some limitations; they are difficult to interpret as there are wide variations in study designs and endpoints and volume changes do not necessarily give rise to symptoms [9].

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Subjective assessments of pain, swelling and numbness are known to be more sensitive measures of functional outcomes and the impact of breast cancer treatments on QoL.

Over the last 10 years the protocol at Nottingham City Hospital, following mastectomy or wide local excision for primary operable breast cancer (<5 cm), has been to carry out an ANS with a four-node sample, at the primary surgery. Node-positive patients receive radiotherapy (or occasionally clearance, but not both) to the axilla unless their tumours are grade I. Node-negative patients do not receive axillary prophylactic therapy.

Prior to 1988, patients did not receive either axillary prophylaxis or adjuvant systemic therapy. Between 15 and 20% of the women in the follow-up clinic would have received prophylactic surgery or radiotherapy to the axilla.

We conducted a two part study to examine the incidence of symptomatic LE and arm problems in a cohort of patents in follow-up for primary breast cancer.

2. Patients and methods

Patients recruited to this study attended the Primary Breast Cancer (PBC) follow-up clinic at the Nottingham City Hospital. All were diagnosed with primary operable invasive breast between 1973 and 2000 and were interviewed at various times of follow-up. Patients with axillary recurrence uncontrolled by therapy do not continue to attend this clinic. The study was conducted in two parts as described below.

2.1. Part 1

Within a 15-week period, all patients attending the PBC clinic who self-reported a swelling of the arm were noted and studied for obvious oedema by the examining clinicians.

2.2. Part 2

This study was conducted over a 13-week period. All patients attending the PBC clinics were given a questionnaire combining an abbreviated form of FACT B+4 [9], EQ-50, and Speilberger questionnaires, similar to those in the MRC ALMANAC protocol [10].

The questions asked related to pain and numbness, ability to work, satisfaction–QoL, self-consciousness, arm movement and stiffness and arm swelling. All questions used a three-point answer system—'None', 'A little' or 'A Lot'. Data were recoded as 0='None' and 1='A little' or 'A Lot', for ease of analysis.

3. Results

3.1. Part 1

1242 patients were interviewed for symptoms of arm swelling and examined for obvious arm swelling. Of these, only 5 (0.4%) reported problematic symptoms affecting their QoL (Table 1). Of these 5, 3 underwent mastectomy (of which 2 had clearance) and 2 had breast-conserving surgery (1 with a four-node sampling and radiotherapy). All 5 had therefore received prophylactic therapy to the axilla. There were no cases with symptoms following axillary sampling only. No other patient had an obvious arm swelling in the absence of symptoms.

3.2. Part 2

Six hundred and seventy-seven questionnaires ($n=677$) were completed for analysis. 31 patients (6.2%) reported arm swelling and of these 5 (0.7%) complained of bilateral swelling (although they had only received unilateral surgery). Other (cosmetic) problems were significantly more commonly reported in the mastectomy group ($P=0.002$) compared with the wide local excision (WLE) group. Interestingly, there was no significant difference between the cosmetic issues or arm problems (including swelling) in the mastectomy group, but in those who underwent WLE and complained of arm problems, there was a significant difference ($P=0.002$). Additional complaints such as pain or stiffness was rarely seen without symptomatic swelling (Table 2).

Significant differences between the mastectomy and WLE group for pain ($P<0.005$) and swelling ($P<0.02$) were seen, but not for numbness or stiffness.

4. Discussion

Several studies have attempted to quantify the functional impairment of LE using subjective (self-reporting) tools. Tobin and colleagues [11] used the Karnofsky

Table 1
Patients who reported arm swelling ($n=5$) from a cohort of 1242 patients in follow-up

Patients	Surgery	Axilla	R/T	Node sampling at presentation
1	WLE	ANS	Yes	+3
2	WLE	ANC	No	+7
3	Mx	ANS	Yes	+1
4	Mx	ANC	No	+1
5	Mx	ANC	No	+10

R/T, radiotherapy; WLE, wide local excision; Mx, mastectomy; ANC, axillary lymph node clearance; ANS, lymph node sampling.

Table 2
Data from 677 patients on the prevalence of symptoms in swollen or non-swollen arms

	No swelling	Swelling	Fisher's exact test	Relative Risk (RR) (95% CI)
Pain				
No	541	21	$P<0.0001$	1.93 (1.38–2.70)
Yes	17	17		
Tender				
No	521	19	$P<0.0001$	1.42 (1.17–1.72)
Yes	34	16		
Cosmetic				
No	499	24	$P=0.0005$	1.14 (1.03- 1.27)
Yes	61	12		
Stiffness				
No	536	30	$P=0.0007$	1.28 (1.02–1.60)
Yes	20	7		

95% CI, 95% Confidence Interval.

performance scale and reported 46% of 50 patients with LE possessed some degree of functional impairment. Segerstrom and colleagues studied 93 patients treated with mastectomy, clearance and radiotherapy. 40 patients (43%) had LE; 90% of these had functional impairment (shoulder or hand symptoms) [12].

Psychological morbidity, has also been assessed using questionnaire-based tools. Although these studies may provide some insight into the scope of LE as a potential problem, many of these have limitations in their interpretations. Fallowfield alluded to this: "Cross-sectional study designs have limited many assessments to merely symptom frequency counts at particular time points after surgery". Driven by the paucity of research that is able to rigorously assess the impact of breast cancer treatments on patients' QoL, Fallowfield and colleagues have developed and validated the FACT-B + 4 subscale, which we used in this study [9].

This study has not included women with uncontrolled axillary recurrence causing arm oedema. However, other follow-up studies of this population have shown that only around 2% of the women in follow-up for primary breast cancer develop uncontrolled axillary recurrence. Our study has shown that clinically relevant oedema caused by treatment is very uncommon in a clinic where standard surgery includes a four-node sampling of the low axilla and in which less than 20% of patients have received axillary irradiation or clearance.

In our second study, only 6% of patients reported 'A Lot' of arm swelling and most reported 'None at all'.

The National Institute for Clinical Excellence (NICE) guidelines in the United Kingdom (UK) on the follow-up of breast cancer patients [13] states that "lymphoedema prevalence among women treated for breast cancer is in the region of 25–28%" and recommends lymphoedema rates are measured 1 and 3 years after treatment. However, recent evidence and our data show that girth measurements do not correlate with symptoms or QoL and are thus not a useful measurement. These guidelines further recommend that "a lymphoedema service staffed by nurses and physiotherapists should be available for all patients who experience arm swelling or discomfort" yet provides no estimate on the cost of the implementation of such service networks. In a centre such as ours, where clinically problematic LE rates are exceedingly low, such measures could be a waste of time and resources.

We conclude that LE can be kept to very low levels by protocols that select a minority of patients for prophylactic axillary therapy based upon proof of nodal positivity and do not use both treatment modalities for such prophylaxis.

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