European Journal of Surgical Oncology 1998; **24**: 280–282

Staging the axilla in breast cancer: an audit of lymph-node retrieval in one U.K. regional centre

M. A. Kutiyanawala, M. Sayed, A. Stotter, R. Windle and D. Rew

Leicestershire Breast Unit, Glenfield General Hospital, Leicester, U.K.

Aims: Many surgeons undertake a level 1 axillary dissection in patients with invasive breast cancer. This dissection yields a variable number of lymph nodes for histological study. In this study, we report the consequences of this policy for staging of the axilla.

Methods: Between January 1995 and December 1995, 236 patients with a diagnosis of invasive breast cancer underwent axillary surgery.

Results: A median of eight nodes was identified (range 0–30). In only 11 patients less than four nodes were identified. An increase in the number of nodes harvested was associated with a higher proportion of node-positive patients and a higher number of metastatic nodes identified.

Conclusions: We concluded that a standardized approach to axillary dissection consistently yields an adequate sample of lymph nodes for staging purposes. Most importantly, larger node samples yield higher detection rates for metastasis. This has a significant bearing on patient selection for adjuvant chemotherapy when compared with more limited sampling practices, including solitary sentinel node detection and biopsy.

Key words: **breast cancer; lymph nodes; axilla.**

Introduction

The optimal policy for axillary surgery in staging and therapy of breast cancer remains controversial. Various procedures have been described for axillary surgery from axillary node biopsy to complete axillary clearance. There are various views on the extent of surgery necessary for accurate nodal staging. Many surgeons consider that a minimum of four lymph nodes is required for staging.[1,2] A more recent approach is to focus on the sentinel node as identified by radiolabelling.

A limited sampling policy runs the risk of underestimating the stage of the tumour.[3] Node positivity is one indicator for the use of adjuvant chemotherapy and appropriate treatment may not be recommended if staging is inadequate and nodal metastasis is not diagnosed.[4] Complete clearance is arguably the best treatment if axillary nodes are involved. If undertaken as an initial staging procedure, it would not benefit the patients who do not have metastatic disease in the axilla and also has a significant morbidity.

At the Leicestershire Breast Unit, patients with operable invasive breast cancer undergo a level 1 axillary node dissection for staging purposes. The aims of this study were to assess the number of nodes removed with this standard axillary dissection policy and to study the consequences for referral rates for chemotherapy in a cohort of patients presenting to the unit in 1995.

Correspondence to: M. A. Kutiyanawala, Department of General Surgery, Glenfield General Hospital, Groby Road, Leicester, LE3 9QP, U.K.

Patients and methods

During a 12-month period from 1 January 1995 to December 1995, 256 patients were treated in the Leicester Breast Unit for operable invasive breast cancer under the care of three consultant surgeons with a specialist interest. These included 73 patients referred from the National Breast Screening Program. Of the 256 patients, 236 underwent an axillary dissection. They were identified using the surgical unit computer database and cross-checked using the pathology department database. Parameters recorded included age, the procedure undertaken, tumour pathology, the number of nodes harvested from each specimen and the number of positive nodes.

Surgical technique

The axillary vein was identified and all lymphatic tissue harvested inferior to the vein. The lateral boundary of the dissection was the outer border of the latissimus dorsi muscle. The dissection extended along the axillary vein medially to the outer border of the pectoralis minor. The thoracodorsal neurovascular bundle and the long thoracic nerve were identified and preserved. The intercostobrachial nerve was identified and preserved if possible. There were

0748-7983/98/040280+03 $12.00/0

Table 1. Relationship of the number of lymph nodes harvested to the proportion of node-positive patients and the degree of nodal involvement

Nodes harvested	Node-positive patients	Number of patients	Patients with positive nodes (%)	Histologically positive nodes (%)		
				=1	1–3	>4
0–3	3	11	27.3	66.6	33.3	0
4–6	16	50	32.0	43.8	43.8	12.5
7–9	39	96	40.6	53.8	23.1	23.1
10–12	20	51	39.2	25.0	40.0	40.0
13–14	9	14	64.3	22.2	33.3	44.4
15+	10	14	71.4	40.0	20.0	40.0
Total	97	236		41.9	32.2	26.7

minimal variations in technique and extent according to each individual surgeon and to the anatomy of individual patients.

Results

A total of 236 patients underwent axillary surgery. Of these, 94 patients underwent a mastectomy and 142 had a wide local excision. The mean age of the patients was 55 years (range 26–84).

In 225 (95%) patients, four or more lymph nodes were identified on standard pathology examination. The median number of nodes harvested was 8 (SD 3.3). In one patient no nodes were identified and 11 patients had less than four nodes identified. There were 20 'elderly' women, above 70 years of age, who had a surgical procedure as a second line treatment after having failed to respond to hormonal treatment, for whom axillary sampling was less extensive than in younger women.

Of the 236 patients, 97 (41%) were node positive. It was observed that with an increase in the number of nodes harvested there was a proportionate increase in the percentage of patients identified with lymph-node metastases in the axilla. Less than one-third had disease spread identified in the axilla when six or fewer nodes were identified, compared to over two-fifths when more than six nodes had been excised (Table 1).

In patients with axillary lymph-node metastases identified at the initial staging procedure, 42% had a single metastatic node, 32% had between one and three nodes, and 26% had four or more positive nodes on histology. An increase in the degree of nodal involvement was associated with a larger number of nodes examined (Fig. 1).

The procedures were either performed directly by consultant surgeons or by higher surgical trainees under consultant supervision. There was no significant difference in the mean yield of nodes between each surgeon and there was no significant correlation between grade of cancer (Table 2), age (Table 3) and size of tumour (Table 4), and the number of nodes removed.

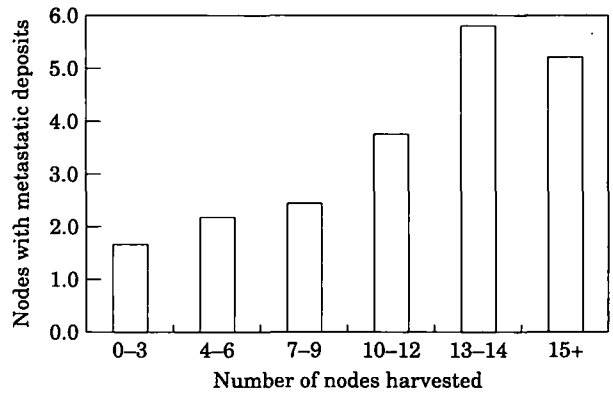

Fig. 1. Relationship between the number of nodes examined and the degree of nodal involvement.

Table 2. Relationship between grade/size of cancer and number of nodes removed

Tumour grade	Number of patients	Nodes harvested (mean)	Average tumour size (mm)
0	8	8.1	23.9
1	48	7.2	17.0
2	94	9.2	22.6
3	86	8.7	27.9

Table 3. Relationship of age of patients to number of nodes harvested

Age (years)	Number of patients	Nodes harvested (mean)
<40	25	8.7
40–55	98	8.8
55–70	93	8.6
>70	20	7.3

Discussion

Assessment of axillary lymph-node status in patients with operable invasive breast cancer is important for prognostic purposes and therefore in treatment planning. It identifies women with 'early' breast cancer who would benefit from adjuvant cytotoxic chemotherapy.[4,5] Steele *et al.* concluded that careful sampling of the 'lower' axillary nodes may provide adequate qualitative information on axillary node status.[1] Histological examination of a (three- or) four-node

Table 4. Relationship of tumour size to number of nodes harvested

Tumour size (mm)	Number of patients	Nodes harvested (SD) mean
<10	28	8 (33.5)
10–25	141	8.4 (3.1)
25–50	56	9.4 (4.0)
>50	11	7.7 (4.1)

sample is deemed adequate for staging purposes.[1,2,6,7] Forrest *et al.* during axillary sampling, reported a median yield of four nodes in their patients, 25% of whom had less than four nodes identified.[2] Christensen *et al.* reported that in one-third of their axillary biopsy group, four or less nodes were identified at histopathological examination.[8] To quantify node involvement, a more extensive axillary dissection is necessary; degree of nodal involvement is directly related to the prognosis.[5] Axelsson *et al.* recommended that at least 10 nodes should be removed from the axilla for staging purposes.[3] Axillary clearance (level 3) is the most reliable method for staging the axilla and is also widely accepted as providing the best means of treating the axilla in node-positive patients.[7] Used as a primary staging procedure this would, however, expose over half the patients in this series, who had no axillary node spread, to a more radical procedure with its attendant morbidity. Staging the axilla by identifying the sentinel node using radiolabelling and dye techniques has been reported but these techniques have yet to be widely implemented.[9,10]

General use of the level 1 dissection in our unit yields a median of eight lymph nodes for analysis. Our study shows that this standard method of axillary node dissection consistently yields a larger number of lymph nodes for staging purposes than more selective sampling procedures and that there is a risk of underestimating the stage when fewer nodes are removed. This has implications in planning adjuvant therapy, particularly in pre-menopausal women where the presence of any positive nodes is usually an indication for adjuvant chemotherapy. We also observed that as more nodes were harvested, there was an increase in the number of the lymph nodes containing metastatic tumour deposits. Involved nodes may be more easily identified by the pathologist and this may contribute to a higher nodal count.

We conclude that a policy of level 1 axillary dissection for invasive breast cancer increases the identification of metastatic nodal disease. The policy thus affects the staging of patients and consequently their referral for adjuvant chemotherapy.

References

1. Steele RJC, Forrest APM, Gibson T, Stewart HJ, Chetty U. The efficacy of lower axillary sampling in obtaining lymph node status in breast cancer: a controlled randomized trial. *Br J Surg* 1985; **72:** 368–9.
2. Forrest APM, Evirington D, McDonald CC, Steel RJC, Chetty U, Stewart HJ. The Edinburgh randomized trial of axillary sampling or clearance after mastectomy. *Br J Surg* 1995; **82:** 1504–8.
3. Axelsson CK, Mouridsen HT, Zedeler K. Axillary dissection of level 1 and 2 lymph nodes is important in breast cancer classification. *Eur J Cancer* 1992; **28A(8/9):** 1415–8.
4. Fentiman IS, Mansel RE. The axilla: not a no go zone. *Lancet* 1991; **337:** 221–3.
5. Fisher B, Wolmark N, Bauer M, Redmond C, Gebhardt M. The accuracy of clinical node staging and of limited axillary dissection as a determinant of histological nodal status in carcinoma of the breast. *Surg Gynecol Obstet* 1981; **152:** 764–72.
6. Forrest APM, Stewart HJ, Roberts MM, Steele RJC. Simple mastectomy and axillary node sampling (pectoral node biopsy) in the management of primary breast cancer. *Ann Surg* 1982; **196(3):** 371–8.
7. O'Dwyer P. Axillary dissection in primary breast cancer. *Br Med J* 1991; **302:** 360–1.
8. Christensen SB, Jansson C. Axillary biopsy compared with dissection in the staging of lymph nodes in operable breast cancer. *Eur J Surg* 1993 **159:** 159–62.
9. Veronesi U, Paganelli G, Galemberti V, *et al.* Sentinel node biopsy to avoid axillary dissection in breast cancer with clinically negative nodes. *Lancet* 1997; **349(9069):** 1864–7.
10. Albertini JJ, Lyman GH, Cox C, *et al.* Lymphatic mapping and sentinel node biopsy in the patient with breast cancer. *JAMA* 1996; **272(2):** 1818–22.

Accepted for publication 2 April 1998