

# Audit of Complete Axillary Dissection in Early Breast Cancer

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The role of complete axillary dissection (CAD) in the management of breast cancer is controversial and largely unresolved. Acceptance of the results of trials incorporating CAD assumes that the axillary dissection is truly complete. To address this point, and also to define quality control criteria for this operation within our unit, we audited 100 consecutive axillary dissections as follows: the primary surgeon performed what he/she felt to be a thorough CAD and submitted separately the contents of level I, II and III for pathological evaluation; a second surgeon then independently assessed the dissection and arbitrarily labelled any further excised tissue as level IV. Level IV nodes were retrieved in 38% of cases. Tumour involvement of level IV nodes was noted in 5% (2/38) of dissections where lymph nodes were retrieved, but in neither instance was pathological staging altered. There was a significant decrease in the incidence of level IV node retrieval from 47% (28/60) in the first 6 months of audit to 20% (8/40) subsequently. This novel approach to our continuing audit identified quality control criteria for this procedure in our unit and suggested that audit of this kind benefits training.

**Key words:** complete axillary dissection, audit  
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## INTRODUCTION

AUDIT HAS been defined as "the systematic, critical analysis of the quality of medical care, including the use of resources, the procedures used for diagnosis and treatment, the resulting outcome, and the quality of life for the patient" [1]. Surgical audit programs focus predominantly on the outcome with relatively little attention on the procedure or process of the surgical intervention [2]. Audit of the process of surgery has particular relevance in cancer surgery, where surgical quality control criteria must be fulfilled to give optimal, reproducible treatment results, and to render adjuvant studies more consistent, meaningful and valid. In our unit, we chose to internally audit the operation of axillary dissection as a component of breast cancer surgery, as technically the goal of this anatomical operation is to remove all axillary nodes. We report here on our evolving experience with this novel approach to audit.

## PATIENTS AND METHODS

An audit of 100 consecutive axillary dissections was performed over a 2-year period from January 1991. Six surgeons attached to the Breast Unit participated: a consultant, three senior registrars and two lecturers. The process of audit was as follows: the primary surgeon performed what he/she felt to be a complete axillary dissection, which included division of the pectoralis minor muscle, close to its coracoid insertion, to facilitate level II and III dissection; the contents of levels I, II and III (Table 1) were submitted separately for pathological evaluation. A second surgeon then independently assessed the dissection and arbitrarily labelled any further excised tissue as level IV. All partici-

Table 1. Principal axillary nodal groups

Level I	Lymph nodes lateral to the pectoralis minor (external mammary, subscapular and axillary vein groups)
Level II	Lymph nodes deep to the pectoralis minor (central group)
Level III	Lymph nodes medial to the pectoralis minor (subclavicular group).

pating surgeons were involved in the audit as primary and secondary surgeons, although the number of assessments as secondary surgeon has not been strictly regulated in the series to date.

## Statistical analysis

Statistical significance was computed using Fisher's exact test.

## RESULTS

Extra nodes (level IV) were retrieved by the second surgeon in 38% of cases (Table 2). Nodes were most frequently missed by the primary operating surgeon in the interpectoral area and in the area lateral to the subscapular vessels in level I. Tumour involvement of level IV nodes was present in 2% of all dissections, and in 5% (2/38) of dissections where lymph nodes were retrieved. Analysis of the pattern of nodal involvement (Table 3) indicates that level IV disease did not alter the pathological staging in either case.

The quality of dissection by the primary surgeon, whether consultant, senior registrar or lecturer, improved as the audit proceeded. Most surgeons spent 1 year on the unit and the effect of experience was reflected in the fact that there was a significant overall reduction (45 versus 28%;  $P = 0.04$ ) in the incidence of missed level IV nodes after 6 months had been spent in the audit

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Table 2. Surgical retrieval of axillary lymph nodes

Node level	No. of patients with nodes*	Mean no. (range)	Tumour-positive*	Tumour-negative*
I	100	17 (5-52)	43	57
II	96	5 (0-20)	15	81
III	87	3 (0-12)	9	78
IV	38	1 (0-4)	2	36

\*Figures denote the number of patients where lymph nodes were retrieved by level of dissection, the mean number of nodes retrieved, and the incidence of nodal involvement by tumour.

Table 3. Pattern of lymph node involvement

Node levels	Pattern of involvement						
Level I	+	+	+	+	+	-	+
Level II	-	+	+	+	+	-	-
Level III	-	-	-	+	+	-	+
Level IV	-	-	+	+	-	-	-
Number	25	9	1	1	4	57	3

+, tumour involvement; -, tumour-free.

Table 4. Effect of experience on level IV retrieval

	Level IV node retrieval No./total (%)	P
First period of study (first 6 months)	27/60 (45%)	0.04†
Second period of study (beyond 6 months)	11/40 (28%)	

\* Denotes number of level IV-positive dissections/total number of axillary dissections. † P value (Fisher's exact test) for surgeon following 6 months in the audit compared with first 6 months.

system. The performance of the secondary or assessing surgeon is difficult to assess directly, but level IV nodes were retrieved by all surgeons irrespective of grade and experience.

## DISCUSSION

The role of complete axillary dissection in the management of breast cancer is controversial and largely unresolved [3]. We support axillary dissection as opposed to sampling, non-intervention or radiation in the majority of patients with invasive breast cancer for the following reasons: firstly, since the risk of relapse is directly related to the presence of nodal metastases, the number of nodes involved and level III involvement, a complete dissection yields maximum prognostic information [4]. Secondly, accurate pathological nodal staging remains the most important selection criterion for adjuvant chemotherapy studies in premenopausal women [5]. Thirdly, axillary dissection almost eliminates the risk of axillary relapse, often a debilitating,

catastrophic occurrence refractory to therapy, and this benefit may be associated with improved survival [6, 7]. Finally, performed correctly, axillary dissection is a safe procedure with a low incidence of significant arm swelling [3].

We audited this operation to determine whether surgical quality control criteria were met. In 38 of 100 patients a second surgeon proved that the primary surgeon had performed an incomplete dissection, indicating that the overall incidence of incomplete dissection was at minimum 38%. This figure is surprisingly high, particularly as the knowledge of the primary surgeon that his/her work was about to be audited by a colleague might have been expected to be associated with a more thorough and fastidious dissection.

Did we benefit from the audit? Since tumour involvement was observed in only 2 of the 38 cases with missed nodes, pathological staging and hence information required for prognosis and adjuvant treatment was not enhanced by the study. Since the objective of this audit, however, was to establish quality control criteria for this operation in our unit, we feel that this was achieved in two principal ways. Firstly, we identified that the quality of this cancer procedure, if not audited, would have been unsatisfactory in 38% of patients. Secondly, since the incidence of missed nodes in dissections performed by all surgeons significantly decreased as further experience was obtained, the study provides objective evidence which strongly suggests that auditing of this kind benefits surgical training.

We firmly believe that this somewhat novel approach to audit has an important role in surgical practice, especially oncological surgery. Establishing surgical quality control criteria for a particular oncological operation will train surgeons who can obtain reproducible surgical results. It is patently clear from many studies that cancer patients who undergo surgery that does not fulfil quality control criteria have significantly lower survival than those in patients who had appropriate surgery [8, 9]. Furthermore, audits of this kind, by strictly defining quality control, will enhance the interpretation of adjuvant therapy studies, many of which are skewed by inadequate or inappropriate surgery. Finally, once optimal quality control criteria are met within a unit, it would be perfectly feasible for surgeons, trained in this system, to perform comparative audit in other hospitals in an attempt to ensure that good standards are held nationwide rather than in isolated units.

1. Working Paper 6. *Medical Audit*. London, HMSO, 1989.
2. Smith R. Medicine's need for kaisen. *Br Med J* 1990; **301**, 679-680.
3. Fentiman IS, Mansel RE. The axilla: not a no-go zone. *Lancet* 1991; **337**, 221-223 (and subsequent correspondence pp. 438, 486, 988, 1221).
4. Veronesi U, Luini A, Galimberti V. Extent of metastatic axillary involvement in 1446 cases of breast cancer. *Eur J Surg Oncol* 1990; **16**, 127-133.
5. Early Breast Cancer Trialists' Collaborative Group. Effects of adjuvant tamoxifen and of cytotoxic therapy on mortality in early breast cancer. *N Engl J Med* 1988; **319**, 1681-1692.
6. Hayward JL, Caleffi M. The significance of local control in the primary treatment of breast cancer. *Arch Surg* 1987; **122**, 1244-1247.
7. Cabanes PA, Salmon RJ, Vilcoq JR, et al. Value of axillary dissection in addition to lumpectomy and radiotherapy in early breast cancer. *Lancet* 1992; **339**, 1245-1249.
8. Balch CM. Surgical oncology in the 21st century. *Arch Surg* 1992; **127**, 1272-1278.
9. Heald RJ, Ryall RDH. Recurrence and survival after total mesorectal excision for rectal cancer. *Lancet* 1986; **i**, 1479-1482.