Annals of the Royal College of Surgeons of England (1992) *vol.* 74, 178–180

Does surgical experience influence mastectomy complications?

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Key words: Breast neoplasms; Therapy; Surgery

Mastectomy remains the most commonly performed surgical procedure for breast cancer, and complications such as infection or wound breakdown (which may relate to the experience of the operator) could expensively prolong hospital stay and retard the administration of additional therapy. We examined the complications, hospital stay and cost of therapy of total mastectomy and axillary node clearance in 164 women, comparing these between four grades of surgeon: registrar (67 operations), senior registrar (58), part-time consultant (21) and professor (18). Our policy, for local reasons, was to perform mastectomy whenever possible rather than select lesser surgical or non-surgical management options. There was no significant difference between operators when the percentage of seromas requiring aspiration (9, 3, 5, 6), infection (16, 7, 23, 11), or wound breakdown (7, 3, 5, 6) were compared. Neither the length of hospital stay (9.3 ± 6.9, 8.2 ± 4.7, 9 ± 7.3, 9.2 ± 11.2 days), nor cost (2005, 1939, 1966, 1927 rands) differed. Surgical experience did not significantly influence mastectomy complications.

The experience of the operator has been reported to influence the outcome of certain surgical procedures *(1–3)*. Such an influence may play a part in the morbidity found after mastectomy, where haematoma and seroma formation, infection and wound breakdown produce considerable debility, prolong hospital stay and retard the commencement of adjuvant therapy. We examined the influence of the surgical experience on the morbidity of total mastectomy and axillary clearance undertaken in a group of elderly women.

Methods

We retrospectively analysed the records of 164 women, who were 65 years and older (mean 72 ± 6.1, range 65–90 years), who underwent a total mastectomy and axillary gland clearance for operable (T_{1-3}, N_{0-2}, M_0) breast cancer over a 6-year period. Our policy, for local reasons, was to perform a mastectomy whenever possible in order to achieve disease control; this was done irrespective of age or tumour size, the options of lesser surgery or tamoxifen alone seldom being used. All had a similar procedure: a transverse elliptical incision encompassing the lesion was used with standard skin flaps, and the axillary node clearance was performed without preserving the pectoralis minor muscle. Two 6 mm vacuum drains were inserted in all patients. The wound closure was performed using a variety of suture materials according to individual preference, and no prophylactic antibiotics were used.

Complications were noted in the ward and at follow-up after discharge. Any report of exudate from the wound was regarded as infection, irrespective of the absence of bacteriological evidence of this; only haematomas and seromas requiring aspiration were compared between the groups of operators.

The operations were performed by four grades of surgical staff: registrars in 67 (41%), senior registrars in 58 (35%), part-time consultant specialists in 21 (13%) and professorial staff in 18 (11%) instances. To determine whether selection bias had favoured any particular

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Table I. Comparison of the distribution of patients with risk factors among registrars (Reg), senior registrars (SR), part-time consultants (PTC) and professors (Prof)

	Total	*Reg*	*SR*	*PTC*	*Prof*	*P*
Operations (%)	164	67 (41)	58 (35)	21 (13)	18 (11)	
Node + (%)	68 (41)	25 (37)	26 (45)	7 (33)	10 (55)	0.77
T_3 lesion (%)	21 (13)	9 (13)	7 (12)	4 (19)	1	0.73
ASA grade 3 (%)	27 (16)	11 (16)	9 (16)	4 (19)	3 (16)	0.99
Diabetes (%)	25 (15)	10 (15)	12 (20)	0	3	0.24
Obesity (%)	65 (40)	24 (35)	24 (41)	14 (66)	3 (16)	0.20
Mean age (years)	72 ± 6	72.8 ± 6	72.6 ± 6	71.7 ± 5	73.3 ± 7	

group with easier and possibly less complicated cases, factors thought to influence the complication rate were compared: age, anaesthetic risk by ASA grading (American Society of Anaestheologists), and the presence of diabetes, obesity, advanced local stage (T_3) and node positivity. The cost of hospital stay was calculated, for the purpose of comparison, in 1990 South African rand terms as follows: general ward/day, R165; theatre, R5.2/minute; intensive care unit, R390/day.

Results

There appeared to be no selection bias with regard to risk factors for mobidity when patients allocated to the four groups of operators were compared ($P > 0.24$, χ^2) (Table I).

Three (1.8%) patients died: a 76-year-old with mild hypertension (ASA grade 2) developed postoperative pulmonary oedema, probably related to excessive intravenous fluid administration; a 73-year-old with known ischaemic heart disease and diabetes (ASA grade 3) suffered a postoperative stroke; an 82-year-old with chronic active hepatitis (ASA grade 3) went into progressive liver failure. These patients were operated on by a registrar, senior registrar and professor, respectively. Systemic complications occurred in 12 (7%) of patients: five suffered cardiac arrythmias which required short-term postoperative intensive care monitoring in three; pneumonia or atelectasis occurred in four patients; two patients developed unexplained pyrexia and one developed urinary tract infection.

Local complications occurred in 44 (27%) of patients: 22 (13%) developed some degree of wound infection or breakdown such that one or more additional dressings were required; 10 (6%) of patients required aspiration of seromas; skin edge necrosis occurred in nine (6%) of patients, of whom four required a subsequent skin graft to cover the defect and three (2%) of patients required evacuation of wound haematomas. There was no difference in the frequency of these complications when the groups of operator were compared (Table II, $P > 0.2$, χ^2).

The mean hospital stay was 8.8 days (range 4–55 days). Patients who had an uncomplicated course had a mean hospital stay of 7 days (range 4–8 days), while those with complications stayed a mean of 10 days (range 7–55 days). There were no differences in the hospital stay, nor cost of the procedure between the four groups.

Discussion

The rank (and therefore arguably the experience) of the operator did not appear to influence the type or frequency of complications after mastectomy. Surgical experience is apparently a factor in the rate of recurrence after highly selective vagotomy *(1)*, in the incidence of

Table II. Comparison of the systemic and local complications, length of hospital stay and cost between groups of operators (*P* calculated by χ^2 and analysis of variance)

	Total	*Reg*	*SR*	*PTC*	*Prof*	*P*
Patients (%)	164	67 (41)	58 (35)	21 (13)	18 (11)	
Uncomplicated (%)	109 (66)	38 (52)	43 (69)	14 (62)	14 (72)	0.77
Deaths	3	1	1	0	1	0.63
Systemic complications (%)	12 (7)	4 (6)	4 (7)	2 (10)	2 (10)	0.89
Seroma aspirations (%)	10 (6)	6 (9)	2 (3)	1 (5)	1 (6)	0.67
Infections (%)	22 (13)	11 (16)	4 (7)	5 (23)	2 (11)	0.31
Haematomas	3	1	1	0	1	0.63
Wound breakdown	9 (5)	5 (7)	2 (3)	1 (5)	1 (6)	
Hospital stay (days)	8.8 ± 6.9	9.3 ± 6.9	8.2 ± 4.7	9 ± 4.7	9.2 ± 7.3	0.81
Cost/patient (rands)		2005	1939	1966	1927	

bile duct injury during cholecystectomy (*2*) and in postoperative mortality after radical gastrectomy (*3*). An isolated report found that after a Halsted radical mastectomy, resident staff had higher incidences of postoperative seroma and skin flap necrosis than consulting staff (*4*). In our study, however, using the lesser operation of total mastectomy and axillary clearance (Patey mastectomy), no difference was found. Our lack of difference in the frequency of complications found between different grades of surgeon may be due to the fact that professorial staff, part-time consultants and senior registrars are all essentially experienced specialist surgeons, and the registrar grade was well-supervised.

Our overall mortality (1.8%) and morbidity (33.5%) after mastectomy in elderly women is comparable to certain reports (*5,6*): Hunt, for example, reported a mortality of 2% and morbidity of 30% in this age group (*6*). Our mortality rate would, however, be regarded as high by those who currently use other options, particularly tamoxifen without surgery, in the frail or elderly. These options, however, are often inappropriate in our setting where lack of compliance and erratic attendance are common.

Just over one-quarter of patients developed local complications, the most frequent (13%) of which was wound infection. These infections were usually minor and merely required local dressings to the affected part of the wound. Wound infection after mastectomy has been reported at a frequency of 7.1% (*5*), 7.3% (*7*) and 8.9% (*4*). The explanation for our high rate might be due to the fact that in this study we defined infection as any wound condition that required additional dressings, regardless of bacteriological proof of infection. The four patients who required skin grafting for skin necrosis had large T_3 lesions, and in each of them we had felt that the mastectomy option was better than its alternatives.

Thus, in our setting—with our policy to perform a mastectomy whenever possible—between one-quarter and one-third of women suffered some form of complication, but these complications did not correlate with the grade of operator performing the operation. Surgical experience did not influence mastectomy complications.

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Received 26 July 1991

Assessor's comment

The first CEPOD report on the increased hazards of operation by junior surgeons (or by senior surgeons who were less practised in particular manoeuvres) has confirmed the Lothian Audit system analyses. These demonstrated the poorer results and higher complication rate in gastrointestinal operations. There has, to my knowledge, been no publication of results of varying seniority of surgeons in breast operations and this paper is welcome.

Mastectomy of the Patey variety, including axillary node clearance, is the standard treatment in the Cape Town Unit. The death rate at first sight appears to be high (1.8%), but in each case there was additional preceding pathology. Local complications occurred in 27 patients including a higher degree of wound infection or breakdown than we would expect in British breast units. This is probably related not to the operator but to the older age group and, possibly, with the different nutritional status of their patients. The authors make it clear that there is no variation in complication rate whether the operator was Registrar, Consultant or Professor.

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