

# Should breast reduction surgery be rationed? A comparison of the health status of patients before and after treatment: postal questionnaire survey

Anne Klassen, Ray Fitzpatrick, Crispin Jenkinson, Tim Goodacre

## Abstract

**Objectives**—To assess the health status of patients before and after breast reduction surgery and to make comparisons with the health status of women in the general population.

**Design**—Postal questionnaire survey sent to patients before and six months after surgery.

**Setting**—The three plastic surgery departments in the Oxford Regional Health Authority, during April to August 1993.

**Subjects**—166 women (over the age of 16 years) referred for breast reduction; scores from the "short form 36" (SF-36) health questionnaire completed by women in the 1991-2 Oxford healthy life survey.

**Main outcome measures**—Health status of breast reduction patients before and after surgery as assessed by the SF-36, the 28 item general health questionnaire, and Rosenberg's self esteem scale; comparisons between the health status of breast reduction patients and that of women in the general population; outcome of surgery as assessed retrospectively by patients.

**Results**—Differences between the health status of breast reduction patients and that of women in the general population were detected by the SF-36 both before and after surgery. Breast reduction surgery produced substantial change in patients' physical, social, and psychological function. The proportion of cases of possible psychiatric morbidity according to the general health questionnaire fell from 41% (22/54) before surgery to 11% (6/54) six months after treatment. Eighty six per cent (50/58) of patients expressed great satisfaction with the surgical result postoperatively.

**Conclusion**—The study provides empirical evidence that supports the inclusion of breast reduction surgery in NHS purchasing contracts.

## Introduction

In 1993-4, NHS hospitals in England carried out 2353 breast reduction operations, a rate of 9.5 per 100 000 females.<sup>1</sup> Using healthcare resource groups and a method of case weights described by Soderlund *et al*,<sup>2</sup> we calculated the cost to the NHS for these procedures to be about £2.6m. Breast reduction is still available on the NHS, but purchasers are asking whether this procedure and other forms of cosmetic surgery are justified in a cash limited, state funded medical system. For example, in the counties of the former Oxford Regional Health Authority, where this study was based, all four district health authorities have excluded the purchase of various forms of cosmetic surgery either from service contracts or by using the approval mechanisms for extracontractual referrals. In two districts breast reduction is one of the excluded procedures. To obtain a breast reduction, a patient's clinician must present her case to the relevant district health authority, and the onus of proof of need is on the referring clinician.

Cosmetic surgery is one of the few areas of health care that have been explicitly rationed in the NHS.<sup>3</sup> The

public often perceives cosmetic surgery to be trivial and of lower priority compared with many other medical interventions.<sup>4</sup> Inevitably, many procedures classed as cosmetic surgery will increasingly be excluded from service contracts around the country unless evidence to justify their inclusion is forthcoming. Yet at least one study in Britain has documented improvements in the quality of life of patients treated for several different cosmetic procedures.<sup>5</sup>

We aimed to measure the health status of patients undergoing breast reduction before and six months after surgery with three standardised health status instruments and to assess the benefits or lack of benefits of breast reduction to shed further light on the wisdom of excluding such procedures from health purchasing contracts.

## Method

### RECRUITMENT

We identified subjects from two sources: new referral letters to plastic surgery outpatient departments and waiting lists for admission. When the study was set up, there were three plastic surgery departments and nine consultant plastic surgeons in the Oxford region serving a population of 2 593 300. Patients were recruited into the study from all nine consultants. Patients had to be aged 16 years or older. Preoperative questionnaires with a covering letter were posted by plastic surgeons to their patients between April and August 1993. Up to two reminders were sent to non-respondents, both of which took the form of a letter with another copy of the questionnaire. On the questionnaire patients could select to be excluded from follow up. As many of the respondents as possible were also sent a postoperative questionnaire six months after surgery.

### DATA COLLECTED

The preoperative and postoperative questionnaires contained several well validated standardised health status instruments, including the short form 36 (SF-36), the 28 item general health questionnaire, and Rosenberg's self esteem scale. The SF-36 is a short, 36 item questionnaire that measures the following eight dimensions of health related quality of life: physical function; social function; role limitations due to physical problems; role limitations due to emotional problems; mental health; energy and vitality; pain; and general health perception.<sup>6,7</sup> For each dimension the item scores are coded, summed, and transferred on to a scale of 0 to 100, in which higher scores indicate better health status. The general health questionnaire is a measure of psychological wellbeing used extensively in Britain<sup>8</sup>; a score greater than four out of a possible 28 is taken to show possible psychiatric morbidity in the form of non-psychotic psychological illness. Rosenberg's self esteem scale is a 10 item questionnaire designed to measure subjects' self concept, with higher scores indicating higher self esteem.<sup>9</sup> In addition to using the standardised scales, the preoperative questionnaire asked patients about their general health and medical history, demographic details, and socioeconomic status, as well as several questions related to their particular

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condition. The postoperative questionnaire included several questions about the patient's view of the outcome of surgery. Patients' case notes were consulted for details about the referral for plastic surgery. Reports on waiting lists provided the length of wait for surgery.

Data for women included in the 1991-2 Oxford healthy life survey<sup>10</sup> were obtained on computer disk. These data represented a random sample of women aged between 18 and 64 years from the four counties of the Oxford region. The methods of this survey are described in detail elsewhere.<sup>10</sup> The data obtained from the survey included SF-36 scores and sociodemographic details for the respondents. All data were entered into a computer and analysed with SPSS for Windows.

#### STATISTICAL ANALYSIS

In all analyses significance was taken at the 5% level. To check for response bias, non-respondents in both the preoperative and postoperative samples were compared with respondents on several variables by using independent sample *t* tests on data with normal distributions and Mann-Whitney U tests for data that were not normally distributed. The  $\chi^2$  test was used to assess the significance of differences in proportions.

Multiple regression analysis was used to compare the mean scores before and after surgery of the patients who were to have or had had breast reduction (breast reduction patients) with those of the general female population, with adjustments for the effects of age. Each of the SF-36 dimensions was included separately in the analysis as the dependent variable, and age and the presence or absence of the breast condition were the independent variables. Regression coefficients were used to indicate mean deviations from the population norms by the breast reduction patients. Significance was determined on the data after these had been rank normalised.

Statistical analysis of the data provided at the two time points was performed by using either paired samples *t* tests or Wilcoxon's matched pairs signed ranks tests as appropriate. Effect sizes were calculated according to the method recommended by Kazis *et al* by taking the mean change in a variable and dividing it by the baseline standard deviation.<sup>11</sup> It has been suggested that an effect size of 0.2 or less is small, 0.5 is moderate, and 0.8 or greater is large.<sup>12</sup>

#### Results

In total, 166 patients referred for breast reduction were sent a preoperative questionnaire. Sixty five patients were recruited from referral letters and 101 patients from waiting list reports. Of these, 10 patients were excluded and 28 did not return the questionnaire. Completed questionnaires were therefore obtained from 128 patients (response rate 82%). The 28 non-respondents did not differ significantly from the respondents in terms of age, method of recruitment, placement on to the waiting list, or duration of wait for an outpatient appointment.

Respondents waited on average 100.3 (SD 62) days for an outpatient appointment from the date of referral.

**Table 1—Patients' responses in the preoperative questionnaire to questions about frequency of aspects of their breast condition. Values are numbers (percentages) of patients (n = 128)**

	Almost always	Often	Sometimes	Almost never	Not applicable	Missing data
Causes pain or discomfort	62 (49)	34 (27)	24 (19)	5 (4)	2 (2)	1 (1)
Limits physical abilities	65 (51)	29 (23)	25 (20)	8 (6)	1 (1)	0
Makes patient feel self conscious	103 (81)	19 (15)	5 (4)	0	0	1 (1)
Makes patient feel embarrassed	78 (61)	33 (26)	14 (11)	3 (2)	0	0
Makes patient feel unattractive	58 (46)	25 (20)	31 (25)	5 (4)	7 (6)	2 (2)
Adversely affects sex life	32 (6)	19 (15)	38 (31)	16 (13)	19 (15)	4 (3)

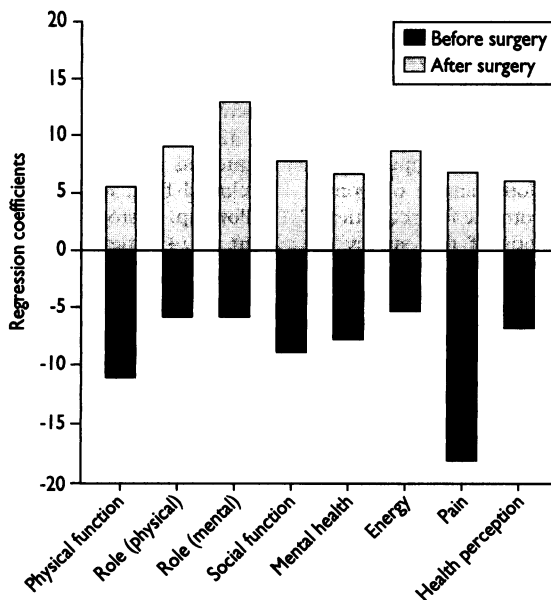
The mean age of patients was 30.5 (SD 10.8; range 16-64) years. Patients spent a considerable time on the waiting list before obtaining treatment. Six months before the end of the study 85 patients had had an operation, having been on the waiting list for an average of 328.8 (SD = 146) days. Ten of these patients had requested on the preoperative questionnaire to be excluded from follow up, and one patient was lost to follow up. Postoperative questionnaires were therefore sent to 74 patients, of whom 58 responded (response rate 68%). Non-respondents were compared with respondents to the postoperative questionnaire in terms of the following variables relating to scores on the preoperative questionnaire: age; length of wait for an outpatient appointment; length of wait for surgery; the eight SF-36 dimensions; scores on the general health questionnaire; and self esteem scores. Non-respondents to the postoperative questionnaire were found to be younger than respondents ( $P = 0.01$ ), but there were no other significant differences.

Patients' case notes were consulted to determine the reason that patients were referred for plastic surgery. Case notes were found for 126 of the 128 respondents. A referral letter was in the notes for 122 of these patients, 121 of whom had been referred by a general practitioner. The reasons given by the referring doctors related predominantly to physical issues, though social, psychological, and practical reasons were also given. Often the referring doctor gave more than one reason for the referral. Pain in the back, shoulder, or neck was the most common reason cited, mentioned in 36 referral letters. Other physical reasons given included: discomfort (27 referral letters), physical limitations when engaging in sports and other activities (22), skin problems, such as rawness, chafing, intertrigo and shoulder marks (18), and pendulous breasts (18). Psychological reasons included embarrassment (15), distress or anxiety (10), self consciousness (9), and depression (6). Among social reasons—which were offered less frequently—were practical problems, such as wearing or buying clothes and bras, for which there were 16 referrals; a further eight referrals cited embarrassment caused by remarks or teasing.

Table 1 contains responses to a series of questions from the preoperative questionnaire that aimed to assess aspects of physical and psychosocial functioning known to be of concern to patients undergoing breast reduction. The women cited a mix of physical, emotional, and social problems as arising from their presenting complaint.

#### HEALTH STATUS OF BREAST REDUCTION PATIENTS COMPARED WITH GENERAL FEMALE POPULATION

Figure 1 shows the mean age adjusted difference in preoperative and postoperative scores for each dimension of the SF-36 comparing patients referred for breast reduction with the general female population. The greatest difference in scores before surgery was in the pain dimension of the SF-36, for which, after adjustment for age differences, the patients referred for breast reduction scored on average 18.1 points lower than the general female population. Preoperatively, patients referred for breast reduction reported themselves to be in significantly poorer health than females in the general population. After the data were rank normalised, the difference between the patients and the general female population was significant for all eight dimensions of the SF-36. The data on which figure 1 is based include all 128 patients for whom baseline scores were available and the 58 patients who completed the postoperative questionnaire. We compared the 58 patients on whom complete data were available with the 70 patients who completed only a preoperative questionnaire. No significant differences were found for any of the dimensions of the SF-36.



**Fig 1**—Differences in age adjusted mean SF-36 scores of breast reduction patients and those in general female population

Six months after surgery the women who had had breast reduction reported themselves to be in better health than the general female population. The differences between the two groups were significant for all eight dimensions of the SF-36.

#### CHANGE IN HEALTH STATUS

Table 2 summarises the data gained from the responses to the three health status instruments both before and after surgery. The results show that the patients underwent moderate to large improvement for all the dimensions of the SF-36: the greatest improvement was in the pain dimension, followed by great improvement in physical function; improvements in social and psychological functioning were moderate. Improvement in self esteem (Rosenberg's scale) was great and in psychological wellbeing (general health questionnaire) moderate.

The data from the general health questionnaire were also examined in terms of the proportion of patients who scored above the cut off point indicative of possible non-psychotic psychiatric disturbance. Preoperative and postoperative data were available for 54 patients. Before treatment 41% (22) of these patients scored high enough to have possible non-psychotic psychiatric

disturbance on the general health questionnaire. Six months after treatment this proportion fell to 11% (6).

The 58 patients who responded at follow up at six months were asked a number of questions to assess their view of the outcome of treatment. Most patients were overwhelmingly pleased with the outcome of the plastic surgery. All except one patient said that the change in their appearance was what they wanted. Forty five patients saw a great deal of change in their appearance, 50 thought that the result was either excellent or very good, and 43 were very pleased with the effect of the operation on their lives.

#### Discussion

The government, the public, and NHS managers generally consider cosmetic surgery to be non-essential or of low priority. The women in this study waited on average over three months for an outpatient appointment and almost a year to obtain treatment.

Health authority purchasers in some district health authorities in England have excluded breast reduction from their contracts,<sup>13</sup> but our results point to strong medical reasons for surgery and significant health gains through treatment. The most common reasons for referral for breast reduction were physical complaints. Women experienced pain, discomfort, and various other medical symptoms from the size of their breasts. General practitioners seem well placed to screen patients; over 80% of new referrals were subsequently assessed as suitable for surgery and added to the waiting list for admission. What we do not know is the proportion of suitable candidates who consulted their general practitioner and were not referred for treatment, nor can we estimate the number of women with this condition who do not come forward for treatment.

This study highlights significant differences between the health status of breast reduction patients before treatment and that of a sample of women in the general population. Breast reduction patients functioned significantly worse on all eight dimensions of the SF-36 questionnaire. Of particular note is the difference in the pain score between groups before surgery. Breast reduction patients improved significantly in health status as a result of surgery. While the extent of improvement observed would be considered moderate to large for many dimensions of health status by statistical criteria, their clinical significance is less easy to determine.<sup>14</sup> However, the benefits observed for SF-36 scores in this group of patients are of a similar magnitude to those observed in patients experiencing improvements from a range of other hospital, medical, and surgical interventions—for example, peptic ulcer,<sup>15</sup> rheumatoid arthritis,<sup>16</sup> gall stones,<sup>17</sup> and inguinal hernia.<sup>18</sup>

Breast reduction is often thought to be a cosmetic operation, and aesthetic concerns undoubtedly feature in

**Table 2**—Effect sizes for each dimension of short form questionnaire (SF-36), general health questionnaire (GHQ-28), and Rosenberg's self esteem scale (RSE)

Dimension	No of respondents	Questionnaire		Change (95% confidence interval)	Effect size
		Preoperative	Postoperative		
SF-36:					
Physical function	56	79.3	95.0	-15.7 (-20.1 to -11.3)	0.83**
Role limitations (physical)	55	82.3	95.9	-13.6 (-21.3 to -6.0)	0.49*
Role limitations (emotional)	55	78.2	93.9	-15.8 (-25.3 to -6.1)	0.47*
Social function	58	77.2	94.3	-17.1 (-23.2 to -10.9)	0.65**
Mental health	57	65.8	77.7	-11.9 (-17.1 to -6.8)	0.59**
Energy and vitality	57	52.8	67.2	-14.4 (-20.4 to -8.4)	0.68**
Pain	54	62.4	87.0	-24.7 (-32.6 to -16.8)	0.90**
General health perception	53	70.1	79.8	-9.7 (-14.3 to -5.0)	0.47**
GHQ-28	54	5.3	1.4	3.8 (2.1 to 5.5)	0.58**
RSE	50	26.8	31.7	-4.8 (-6.4 to -3.3)	0.90**

The sign of direction of change for the effect size has been standardised so that all improvements in functioning show as a positive change. \*P<0.01; \*\*P<0.001.

## Key messages

- Cosmetic surgery is one of the few areas of health care to have been explicitly rationed in the NHS
- The predominant reason for a breast reduction referral was physical, although social, psychological, and practical reasons also had a role
- The health status of breast reduction patients differed significantly from that of the general female population before and after treatment
- The patients who underwent surgery experienced substantial improvements in physical, social, and psychological functioning
- The study shows the need for and benefits of breast reduction surgery and provides supporting evidence for including this form of plastic surgery in purchasing contracts

the procedure. Many women report feeling embarrassed, unattractive, and self conscious owing to the inordinate size of their breasts and the unwanted attention the size attracts. Surgery also addressed this aesthetic aspect of the problem, resulting in moderate change in social and psychological function and large change in self esteem.

The medical community now considers patients' subjective experience of treatment to be of primary importance when assessing outcomes.<sup>19</sup> When asked directly, patients said that they saw a great deal of change in their appearance, reported that the change was what they wanted, and assessed the surgical result as being either excellent or very good.

It is increasingly argued that health authorities should decide which services to include and exclude from contracts informed by evidence of health outcomes, on the basis of quality of life as well as survival. The services most frequently excluded from purchasing contracts include plastic surgery undertaken for cosmetic purposes, removal of tattoos, reversal of sterilisation, and certain infertility treatments. The savings that these exclusions represent are of marginal significance in terms of their impact on overall NHS resources.<sup>13</sup> This study has shown substantial improvements in the wellbeing of breast reduction patients. Such evidence challenges the basis for resource

allocation decisions with regard to breast reduction surgery, and perhaps therefore other cosmetic surgery.

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## Incidence of myocardial infarction in elderly men being treated with antihypertensive drugs: population based cohort study

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### Abstract

**Objective**—To analyse the association between use of antihypertensive treatment, diastolic blood pressure, and long term incidence of ischaemic cardiac events in elderly men.

**Design**—Population based cohort study. Baseline examination in 1982-3 and follow up for up to 10 years.

**Setting**—Malmö, Sweden.

**Subjects**—484 randomly selected men born in 1914 and living in Malmö during 1982.

**Main outcome measures**—Observational comparisons of incidence rates and rate and hazard ratios of ischaemic cardiac events (myocardial infarction or death due to chronic ischaemic cardiac disease).

**Results**—The crude incidence rate of ischaemic cardiac events was higher in those subjects who were taking antihypertensive drugs than in those who were not (rate ratio 2.6 (95% confidence interval 1.7 to 3.9)). After adjustment for potential confounders (differences in baseline smoking

habits, blood pressure, time since diagnosis of hypertension, ischaemic or other cardiovascular disease, hypercholesterolaemia, hypertriglyceridaemia, diabetes mellitus, obesity, and raised serum creatinine concentration) this rate was reduced but still raised (hazard ratio 1.9 (1.0 to 3.7)). In men with diastolic blood pressure >90 mm Hg, antihypertensive treatment was associated with a twofold increase in the incidence of ischaemic cardiac events (rate ratio 2.0 (1.1 to 3.6)), which vanished after adjustment for potential confounders (hazard ratio 1.1 (0.5 to 2.6)). In those subjects with diastolic blood pressure ≤90 mm Hg, antihypertensive treatment was associated with fourfold increase in incidence (rate ratio 3.9 (2.1 to 7.1)), which remained after adjustment for potential confounders (hazard ratio 3.8 (1.3 to 11.0)).

**Conclusion**—Antihypertensive treatment may increase the risk of myocardial infarction in elderly men with treated diastolic blood pressures ≤90 mm Hg.

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