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## Redefining gigantomastia

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### KEYWORDS

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**Summary** Gigantomastia is a rare but disabling condition characterised by excessive breast growth. Most definitions of gigantomastia refer to a particular weight of excess breast tissue. We speculate that in gigantomastia the weight of the breasts contributes significantly to the BMI, which has implications for healthcare rationing. This study aims to establish the contribution breast tissue makes to BMI in gigantomastia. In so doing, we propose a new definition of gigantomastia.

Retrospective data was collected from the case notes of 68 females who underwent breast reduction or therapeutic mastectomy for gigantomastia. For the purposes of patient inclusion, gigantomastia is arbitrarily defined as excessive breast growth of over 1.5 kg per breast.

The difference between pre- and post-operative BMI is statistically significant ( $P < 0.001$ ). Mean pre-operative BMI is 38.7 with a mean specimen weight of 4506 g. Mean contribution of specimen to body weight is 4.29%. There is no correlation between pre-operative body weight and the percentage contribution the breast resection specimen makes to body weight.

Based on our data, we define gigantomastia as excess breast tissue that contributes 3% or more to the patient's total body weight, approximately one standard deviation below the mean. We suggest that the estimated excess breast tissue weight is taken into account when calculating pre-operative BMI in the gigantomastia population. The challenge of estimating excess breast weight pre-operatively may be met by 3D photography coupled with computer-assisted volumetry.

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Gigantomastia is a rare but disabling condition characterised by excessive breast growth. There is no universally accepted definition of gigantomastia, but the majority of citations refer to a particular weight of excess breast tissue.<sup>1,2</sup> Most agree that the mainstay of treatment for gigantomastia is surgical, in the form of reduction mammoplasty or mastectomy, with or without hormonal therapy.<sup>3</sup> The availability of reduction mammoplasty is frequently rationed by third party fundholders internationally, based on the body mass index (BMI) of patients.<sup>4</sup> Many patients who are denied a breast reduction on this basis believe the mass of their breasts is contributing significantly to their elevated BMI. In practice we have found that this contribution is usually not significant, with a breast reduction specimen contributing a mean of 0.5 BMI points, although in isolated cases it can be greater than 1.<sup>5</sup> However we speculate that in cases of gigantomastia where there is breast hypertrophy out of proportion to the BMI, the contribution of breast tissue to the BMI is more significant. We undertook this study to establish the contribution that resected breast tissue makes to patients' BMI who are undergoing breast reduction or therapeutic mastectomy for gigantomastia. Due to the relatively low incidence of gigantomastia, this study involved collaboration between units in the UK and USA. Based on our data series, we propose a new definition of gigantomastia.

### Patients and methods

Data was collected retrospectively from the case notes of 68 females who underwent a breast reduction or therapeutic mastectomy for gigantomastia using collated data from the UK and USA. For the purposes of patient inclusion, gigantomastia is arbitrarily defined as excessive breast growth of over 1.5 kg per breast, which is popular with many authors.<sup>3</sup> We included patients who had more than 1.5 kg removed from at least one breast. Patient height, pre-operative weight, pre-operative BMI and weight of the resected breast tissue were recorded. This allowed calculation of the projected post-operative weight and BMI by subtracting the weight of the resected breast tissue from the patient's pre-operative weight. The mean, standard deviation (SD), paired *t*-test and the coefficient of determination  $r^2$  are calculated using the AVERAGE, STDEVA, TTEST and RSQ functions of Microsoft Excel 2008 for Mac respectively.

### Results

The results are summarised in Table 1. Data is presented as mean  $\pm$  SD. The difference between pre- and post-operative BMI is statistically significant ( $P < 0.001$ ). The largest contribution a breast reduction specimen makes to a patient's body weight is 8.41%, seen in a patient with a pre-operative body weight of 89.8 kg, BMI 40.0 and resection weight of 7550 g. The relationship between patients' pre-operative body weight and weight of the resection specimen is plotted in Figure 1. As might be expected, there is a positive correlation between the two ( $r^2 = 0.29$ ). However, when pre-operative body weight is plotted against the percentage contribution the resection

**Table 1** Data summary showing mean  $\pm$  SD

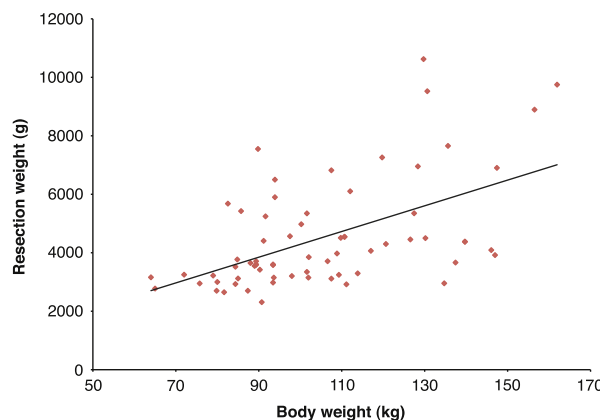
Pre-operative BMI (kg/m <sup>2</sup> )	38.7 $\pm$ 7.29
Weight of specimen – both breasts (g)	4506.4 $\pm$ 1845.4
Calculated post-operative BMI (kg/m <sup>2</sup> )	37.0 $\pm$ 6.97
Contribution of specimen to body weight (%)	4.29 $\pm$ 1.37

specimen makes to body weight (Figure 2), there is no correlation ( $r^2 = 0.00$ ).

### Discussion

Patients who are turned down for breast reduction surgery on the basis of their BMI frequently argue that the weight of their breasts is contributing significantly to their body weight. It has been shown that for the majority of women undergoing reduction mammoplasty with an average combined resection weight of 1.2 kg the reduction in BMI achieved post-operatively is not statistically significant, amounting to an average decrease of 0.48 BMI points.<sup>5</sup> However, a clinically significant reduction in BMI was seen in short, slim patients with large resection weights of greater than 1 kg per breast. We have now examined in detail the relationship between BMI and resection weights in the gigantomastia population to assess whether withholding reduction mammoplasty on the basis of BMI is justified for these patients. Our results show that in gigantomastia, the contribution a breast reduction specimen makes to a patient's body weight is statistically significant. On this basis, it would be fair to estimate the expected weight of the resection specimen pre-operatively and factor this into the calculation of the BMI.

The lack of correlation between total body weight and the percentage contribution the resection specimen makes to body weight is striking. It may be argued that women requesting treatment for gigantomastia whose BMIs fall above the upper limit set by healthcare fundholders have large breasts because they are obese. However, Figure 2 shows that this is not the case. As BMI increases, the breasts of patients with gigantomastia



**Figure 1** Scatter plot with linear regression line showing patient body weight (kilograms) against weight of breast resection specimen (grams).

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