



Published in final edited form as:

*Ann Plast Surg.* 2010 July ; 65(1): 11–16. doi:10.1097/SAP.0b013e3181bba08f.

## Surgical and Minimally Invasive Cosmetic Procedures among Persons with Body Dysmorphic Disorder

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Body dysmorphic disorder (BDD) is a psychiatric disorder characterized by preoccupation with an imagined or slight defect in appearance which causes clinically significant distress or functional impairment. A majority of individuals with BDD have poor insight, believing they have an actual deformity for which cosmetic treatment is needed. Persons with BDD frequently seek cosmetic treatments to fix perceived “defects” rather than psychiatric interventions.<sup>1,2</sup> Conversely, BDD appears relatively common among individuals who receive cosmetic procedures, with reported rates of 7–8% in American cosmetic surgery populations.<sup>3,4</sup> Rates ranging from 2.9%–53%<sup>5–10</sup> have been reported in international cosmetic populations. Methodological limitations, such as small sample sizes and selection biases, may account for the higher rates of BDD obtained in some studies. More recent international studies have reported BDD rates of 3.2–16.6% in cosmetic surgery samples.<sup>8,11,12</sup>

Despite the frequency with which persons with BDD appear to seek and receive cosmetic procedures, few studies have investigated the clinical correlates or outcome of such treatments. In a study of 25 patients with BDD who had undergone cosmetic surgery, most were dissatisfied with the outcome, and some had postoperative symptom exacerbations.<sup>13</sup> In another study, the majority (81%) of 50 patients who had a cosmetic procedure or consultation reported dissatisfaction with the outcome.<sup>14</sup> Among 250 persons with BDD, 66% of whom had received cosmetic treatment for BDD concerns,<sup>1</sup> the most common outcome was no change in BDD severity. A recent report from our group of cosmetic treatment in a BDD sample (n = 200) found that such treatment was sought by 71% and received by 64% of subjects for BDD concerns but rarely improved overall BDD severity.<sup>2</sup> A small prospective study of cosmetic surgery patients who requested treatment of minimal defects found that the majority of those who had BDD received surgery (7 of 10 patients).<sup>15</sup> At follow-up, most continued to have BDD and had developed new appearance preoccupations.<sup>15</sup> In a survey of 265 cosmetic surgeons, 178 reported treating patients with BDD, with only 1% of cases resulting in symptom improvement.<sup>16</sup> These findings, coupled with reports of lawsuits and violence perpetrated by persons with BDD towards

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physicians,<sup>16–20</sup> have led some to conclude that BDD is a contraindication for cosmetic treatment.<sup>21,22</sup>

We previously reported on cosmetic treatment of any type – dermatologic, surgical, dental, and other types – that was sought and received by 200 individuals with BDD.<sup>2</sup> The present report provides a more in-depth examination of the types, outcomes, and clinical correlates specifically of surgical and minimally invasive treatments (MI) sought and received by these 200 individuals, as well as the frequency and reasons requested treatments were not received. We also examine shorter-term versus longer-term outcomes of surgical/MI treatment, which has not been reported for individuals with BDD. Further investigation of this topic is warranted for several reasons. First, in our previous report,<sup>2</sup> we did not examine clinical/demographic features among receivers of surgical/MI treatment specifically. Furthermore, it appeared that a lower proportion of requested surgical procedures were actually received compared to other types of requested cosmetic procedures<sup>2</sup>; however, in our previous report we did not examine this statistically, determine why participants did not receive requested surgery/MI treatment, or examine whether reasons for non-receipt of requested surgery/MI treatment differed from reasons other types of cosmetic treatment were not received. Additionally, little is known about the outcome of MI procedures in BDD, even though MI procedures are among the most frequently performed procedures in the U.S.<sup>23</sup> Finally, to our knowledge, no published studies have examined shorter- versus longer-term outcomes of cosmetic procedures in BDD. This is important to examine as it is not known whether outcomes may change over time.

In this report, we compare clinical and demographic characteristics of subjects who received surgical/MI procedures to subjects who had not received such treatment in our sample of 200 subjects. We also compare demographic/clinical features of subjects who had only one procedure versus those who had multiple procedures. We examine in greater detail the frequency and reasons subjects did not receive requested surgery/MI procedures and whether these reasons differ from those for other cosmetic treatments. We also compare patients who were refused requested surgery/MI treatment by doctors to those who did not receive requested treatment for other reasons. We examine differences in perceived treatment outcome for surgical/MI treatments vs. other cosmetic treatments. Finally, we evaluated gender differences in surgical/MI treatment outcome, since the literature suggests that male patients who receive cosmetic treatments may be more prone to psychopathology and, potentially, violence.<sup>16,24–26</sup>

## Method

### Subjects

The sample consisted of 200 participants from a naturalistic, prospective study of BDD. Participants were recruited from mental health professionals (46%); advertisements (38.6%); our program's website and brochures (10.2%); participants' friends and relatives (3.4%); and physicians (1.7%). Eligibility criteria were: 1) a diagnosis of DSM-IV BDD or its delusional variant (delusional disorder, somatic type); 2) age 12 or older; 3) availability to be interviewed in person; and 4) absence of an organic mental disorder. IRB approval was obtained. Participants provided written informed consent. Assent was obtained from adolescents along with legal guardian consent. All data are from the study's intake assessment; thus, they are cross-sectional and retrospective. Because physicians frequently provide MI treatments in conjunction with surgery, we combined receivers of surgical or MI procedures into one group. “Minimally invasive” refers to cosmetic procedures, such as chemical peels, microdermabrasion, and injectable fillers, which are typically performed on an outpatient basis and do not require general anesthesia or extended recovery periods. All procedures were specifically requested and received for BDD concerns.

## Measures

The *BDD Form* (Phillips KA, unpublished) is a semi-structured instrument used in many prior BDD studies that assesses demographics, clinical features, and treatment history. It retrospectively evaluates the frequency of cosmetic treatment sought and received and treatment-related visits. “Sought” (or “requested”) treatments were those for which the participant had at least one physician visit.

The *Clinical Global Impressions Scale (CGI)*<sup>27</sup> is a frequently used treatment outcome scale that retrospectively evaluated participants' perceptions of their response to cosmetic treatment. Improvement was defined as a CGI rating of “much” or “very much” improved, and worsening as “much” or “very much” worse. CGI ratings of “unchanged,” “minimally worse,” or “minimally improved” were rated as no change. Three aspects of treatment response were rated: 1) participant's appraisal of the actual *appearance* of the treated body part following cosmetic treatment; 2) *preoccupation* with appearance of the treated body part following treatment; and 3) severity of *overall BDD symptoms* (i.e., preoccupation and emotional distress or impairment in functioning due to dissatisfaction with the treated body part *and* with other disliked body parts) following treatment. Ratings reflect the subject's perceptions of longer-term treatment response – i.e., their impression of their response at the time of the study intake interview. Although minimally invasive procedures are not expected to result in permanent appearance changes, we still assessed subjects' perceptions of longer-term treatment response as it is possible that even minor procedures could influence appearance perceptions, degree of preoccupation with the treated feature, and overall BDD severity. For subjects who did *not* report longer-term improvement in both the appearance of, and preoccupation with, the body part, we inquired about temporary improvement in appearance or preoccupation after the procedure was performed. Temporary improvement was defined as “much” or “very much” improvement that was not sustained until the time of the intake interview.

The reliable *Structured Clinical Interview for DSM-IV-Non-Patient Version (SCID-NP)*<sup>28</sup> was used to diagnose BDD and lifetime delusionality of BDD beliefs. The *Yale-Brown Obsessive Compulsive Scale Modified for BDD*<sup>29</sup> (*BDD-YBOCS*), a reliable and valid semi-structured measure, assessed current BDD symptom severity (during the week before the study interview). The *Brown Assessment of Beliefs Scale*, a psychometrically sound instrument, evaluated current (past week) delusionality of appearance beliefs (i.e., how convinced subjects are that perceived defects truly appear abnormal).<sup>30</sup>

## Statistical analyses

Descriptive statistics were calculated. Chi square, Fisher's exact test, and t-tests evaluated between-group differences. Because the two groups differed on age, variables potentially affected by age were analyzed using analysis of covariance or logistic regression, controlling for age. An alpha level of  $p < 0.05$  was chosen a priori without adjustment for multiple analyses because of the analyses' exploratory nature. All tests were two tailed. Effect sizes were calculated using Cohen's *d* for t-tests ( $d=.2$  is small,  $d=.5$  is medium,  $d=.8$  is large) and Cramer's *v* for chi square analyses ( $v=.1$  is small;  $.3$ , medium; and  $.5$ , large). Effect sizes for analysis of covariance were calculated with partial  $\eta^2$  (0.01 is small; 0.06, medium; and 0.14, large); odds ratios were calculated for logistic regression.

## Results

### Demographic and clinical characteristics

Table 1 presents demographic and clinical characteristics of persons who received surgery/MI treatment (n=42) compared to those who never received these treatments (n=158). The

only significant demographic difference was age; surgery/MI treatment receivers were significantly older than non-receivers. Surgery/MI treatment receivers had less severe BDD symptoms and delusionality currently than non-receivers, although effect sizes were small-medium. There were no other significant differences between groups.

### Surgical/MI treatments sought and received

Sixty-two (31%) subjects sought and 42 (21%) subjects received surgical/MI treatment for BDD concerns. Of the 62 seekers, 18 sought MI procedures: 10 sought MI procedures only, and 8 sought both surgery and MI. Fifteen (83.3%) of the 18 subjects who sought MI procedures received them. 44 of the 62 subjects (71%) sought only surgical procedures; 61.3% (n=27) received them.

As previously reported,<sup>2</sup> 148 surgical/MI treatments were sought (118 surgical, 30 MI), and 87 were received (61 surgical, 26 MI). Rhinoplasty was most commonly sought (n=33 procedures) and received (n=23 procedures). Rhinoplasty constituted 37.7% of received surgical procedures and 26.4% of all received surgical/MI procedures. As previously reported, breast augmentation was the second most commonly received surgical procedure (n=5; 8.2% of all surgical procedures).<sup>2</sup> Seven participants (11.3% of patients who sought surgical/MI treatment) desired breast augmentation, and four (9.5% of surgery/MI recipients) received it (one participant had two surgeries).

Collagen injections were the most commonly received MI procedure (n=13 procedures). They constituted 50% of received MI procedures and 14.9% of all received surgical/MI procedures. Of the subjects who sought surgical/MI treatment, six (9.7%) requested collagen injections, and five (11.9%) received them (one participant received two injections, and one subject received eight). Microdermabrasion was the second most commonly received MI procedure (n=5, 19.2% of received MI procedures). It was sought and received by 5 subjects (8.1% of those who sought surgery/MI; 11.9% of surgery/MI receivers).

Of all received surgical/MI procedures, 74.7% (n=65) were performed on facial features; 22 procedures (25.3%) were performed on other body parts. The number of visits to physicians for received surgical/MI treatments ranged from 1–134 (mean:  $5.85 \pm 15.11$ ).

Among surgery/MI treatment recipients, more than one third (n=16; 38.1%) received multiple procedures. Recipients of multiple surgical/MI treatments were older ( $41.6 \pm 10.6$  vs.  $34.5 \pm 8.5$  years,  $p = 0.030$ ,  $d = 0.40$ ) than those who received only one procedure (n=26). No other significant differences were found in clinical/demographic characteristics among multiple versus single surgical/MI procedure recipients.

### Treatment outcome

Table 2 shows subjects' perceptions of longer-term treatment outcome for surgery/MI treatments versus other treatments (263 dermatologic, 26 dental, 42 paraprofessional (e.g., electrolysis), and one other medical treatment (diet pills)). One third of surgery/MI procedures resulted in longer-term improvement in the subject's appraisal of the *appearance* of the treated body part; 25.3% resulted in a longer-term decreased *preoccupation* with the treated body part. A higher proportion of surgical/MI procedures than other cosmetic procedures led to longer-term decreased preoccupation with the treated body part ( $p = 0.04$ ) (Table 2). However, only 2.3% of surgical/MI procedures led to longer-term improvement in *overall BDD symptoms* (i.e., preoccupation and emotional distress or impairment in functioning due to dissatisfaction with the treated body part *and* with other disliked body parts).

Among surgery/MI procedures that did *not* result in *longer-term* improvement in appearance or preoccupation, 43.4% led to *temporary* improvement in appearance and/or preoccupation. This proportion differed from that for non-surgery/MI cosmetic procedures at a trend level (43.4% vs. 32.0%,  $X^2=3.80$ ,  $p=0.051$ ). Treatment outcome did not significantly differ by procedure location (face versus body) or gender.

Since MI procedures are not expected to result in permanent appearance changes, we also examined subjects' perceived longer-term treatment outcomes for MI and surgical procedures separately. In the MI group, we examined treatment outcomes only descriptively because of the small number of procedures ( $n = 26$ ). Among the 26 received MI procedures, 26.9% ( $n = 7$ ) led to longer-term improvement in the patient's perception of the *appearance* of the treated part, 19.2% ( $n=5$ ) resulted in longer-term improvement in *preoccupation* with the treated body part, and only one procedure (3.8%) resulted in longer-term improvement in *overall BDD symptom severity*.

Regarding longer-term treatment outcomes for surgical procedures compared to all other treatments (including MI procedures), there was a trend for surgical procedures to result in longer-term improvement in the *appearance* of the treated body part (36.1% vs. 24.9%,  $X^2 = 3.31$ ,  $p = 0.069$ ,  $v = 0.09$ ). Surgical procedures were significantly more likely to result in longer-term improvement in *preoccupation* with the treated body part (27.9% vs. 15.9%,  $X^2 = 5.16$ ,  $p = 0.023$ ,  $v = 0.11$ ); however, there were no significant differences between surgical versus all other procedures regarding longer-term improvement in *overall BDD symptom severity* (1.6% vs. 4.0%,  $p = 0.368$ ). Additionally, there were no significant differences in longer-term improvement in appearance or preoccupation with the treated body part or overall BDD symptom severity between MI and surgical procedures.

### Sought treatment that was not received

Of all 528 cosmetic procedures of any type that were sought by the 200 subjects, 109 (20.6%) were not received.<sup>2</sup> The mean number of physician visits associated with sought procedures that were not received was  $1.5 \pm 2.12$  (range: 1–16 visits). Sought surgical/MI treatments were less likely to be received than other types of sought cosmetic treatments: 58.8% ( $n=87$ ) of sought surgical/MI procedures were not actually received vs. 87.4% ( $n=332$ ) of other cosmetic treatments ( $X^2=53.13$ ,  $df=1$ ,  $p<0.001$ ).

As shown in Table 3, cost was the most common reason surgical/MI procedures were not received ( $n=18$ , 29.5%) followed by physician refusal to perform the procedure ( $n=16$ , 26.2%). Cost was significantly more often the reason surgery/MI was not received compared to other treatments. However, when comparing surgery/MI to other types of cosmetic treatment, physicians were significantly *less* likely to refuse surgical/MI treatment than other procedures. Of the 61 surgical/MI procedures that were not received, physicians were more likely to refuse procedures sought by men compared to women at a trend level (50% vs. 20.4%,  $p=0.06$ ). There were no other significant differences between those who did not receive surgery/MI treatment because of physician refusal versus other reasons.

When the above analyses were repeated examining surgery alone compared to other cosmetic procedures (including MI), the results were similar (e.g., physicians were less likely to refuse surgical procedures compared to all other procedures; surgery was also less likely to be received because of expense). The small number of MI procedures that were not received ( $n = 4$ ) precluded statistical analyses. Two requested MI procedures were not received because the provider refused to perform the treatment, and two procedures were not received because the person was dissuaded by a relative or friend.



## Discussion

Individuals with BDD who received surgical or MI treatments were older and reported less severe BDD symptoms and delusionalities at the time of the study interview than those who never received these treatments. The mean between-group difference in BDD symptom severity was about 3.7 points on a 48-point scale (small-medium effect size). It is important to note that this finding pertains to symptom severity and delusionalities *only during the week before our study's assessment*, whereas participants could have received surgery/MI treatment at any time in the past. Unfortunately, data are not available on symptom severity, delusionalities, or age at the time surgery/MI was received, and symptom severity and delusionalities can vary over time.<sup>31</sup> Because this study has a cross-sectional/retrospective design, it cannot answer the question of whether surgery/MI led to milder BDD following the procedure. It is equally plausible that those who received surgical/MI treatment had milder BDD and better insight at the time their procedures were performed. A prospective report found that receipt of any type of cosmetic treatment did not predict a better course of BDD over the next year, suggesting that such treatments do not improve BDD.<sup>32</sup> More prospective data are needed to clarify this issue.

Consistent with reports in the literature on “polysurgical addicts” and “surgiholics,”<sup>26,33</sup> 38% of surgical/MI treatment recipients had multiple procedures performed. Our findings provide further evidence that persons with BDD may pursue multiple cosmetic procedures to correct perceived “defects” that in reality are nonexistent or only slight. It is increasingly common for surgeons to perform multiple procedures at the same time and for patients to receive multiple procedures over time.<sup>23</sup> Our finding of a poor longer-term outcome for overall BDD symptoms underscores the importance of asking about BDD symptoms, especially in patients who have had prior cosmetic procedures. It can be challenging, however, to assess for BDD in cosmetic surgery patients, who typically present with concerns about slight appearance “defects.” Thus, it is recommended that physicians assess the degree of preoccupation (time spent per day preoccupied with negative thoughts about disliked body areas), emotional distress, and impairment in daily functioning due to appearance concerns (see reference 34 for more information about assessment of BDD in cosmetic surgery settings). Patients with “normal” appearance who report preoccupation with their appearance as well as significant distress or impairment in daily functioning (such as inability to work or refusal to leave one's home) may have BDD. Brief screening instruments, such as the Body Dysmorphic Disorder Questionnaire,<sup>35</sup> can be useful tools for identifying patients with BDD.

Consistent with previous studies,<sup>1</sup> men were as likely as women to receive surgical/MI procedures. However, physicians were more likely to refuse treatments sought by men than women at a trend level. Although we lack data from physicians regarding why they refused procedures, they may have been more suspicious of males, given reports of psychopathology in males who seek cosmetic procedures.<sup>24–26,36</sup> At least one study of cosmetic surgery patients found that a higher percentage of males had BDD compared to females.<sup>9</sup> Thus, BDD may be overrepresented in male patients, although this issue requires further study.

One quarter of surgical/MI procedures resulted in a longer-term improvement in preoccupation with the treated body part – a proportion that was higher than for other cosmetic procedures. An additional 43.4% of surgery/MI procedures led to temporary improvement in appearance and/or preoccupation that was not sustained over time. This may account for the perception among some surgeons that BDD is not always a contraindication for surgery<sup>16</sup> and the low surgery/MI refusal rate in this study. Over time, however, many temporary improvements were not sustained, and the rate of longer-term overall improvement in BDD symptoms following surgery/MI was only 2.3%. The reasons for this

are not entirely clear. Persons with BDD typically have multiple appearance concerns,<sup>37</sup> and preoccupation with untreated “defects” may have persisted or been so severe that improvement in the treated body part did not impact overall BDD severity. To our knowledge, no other studies have differentiated shorter-term versus longer-term outcomes of cosmetic treatments in persons with BDD. Given these findings, physicians should be aware that temporary improvements following cosmetic treatment appear unlikely to be sustained, and longer-term outcomes appear to typically be poor.

Another possible explanation for improvement in preoccupation with the treated body area specifically, but not overall BDD symptoms, is that after surgery/MI, some patients “switched” their preoccupation to another body area. We did not examine this in our study, but we often observe this clinically; as one patient said, “After my nose job, my nose looked a little better, but my stomach took over for my nose.” Such preoccupation shifts to other body areas have been reported in other studies of BDD in cosmetic surgery populations.<sup>13,15</sup> Switching to another body area is not unexpected, because BDD is characterized by distorted body image and tendencies to obsess and excessively worry about nonexistent or minor flaws. Thus, a “surface” change, such as that accomplished by surgery, is unlikely to treat the underlying disorder.

Neurobiological abnormalities likely play a role in the etiology and maintenance of BDD symptoms.<sup>38–41</sup> One functional MRI study found that compared to healthy controls, persons with BDD demonstrated a bias for detail processing over holistic processing when viewing facial stimuli, as evidenced by greater activation of brain areas that are specialized for more analytic, detail-focused visual processing.<sup>38</sup> In addition, BDD symptom severity was correlated with volumes of brain areas that showed abnormal activation in the fMRI study.<sup>41</sup> Other studies have observed that people with BDD are perfectionistic<sup>42</sup> and over-focus on small details.<sup>39</sup> Such neurobiological differences and perceptual biases are unlikely to be changed by surgery and may potentially explain why individuals with BDD often remain dissatisfied with their “defects” even after undergoing technically successful cosmetic procedures.

It is interesting that sought surgical/MI treatments were less likely to be received than other types of sought cosmetic treatments. This in part reflects the greater cost of surgery/MI than other procedures. However, participants could select only the primary reason treatment was not received; thus, other reasons may have also played a role.

Of note, physicians were significantly *less* likely to refuse surgery/MI treatment than other types of treatments (e.g., dermatologic, dental, and other procedures). Indeed, physicians refused only 16 procedures (10.8%) of all requested surgical/MI treatments (n=148 procedures). This suggests that many surgeons were not aware of the patient's BDD or do not consider BDD a contraindication to treatment. In a survey of 265 cosmetic surgeons, only 30% believed that BDD was *always* a contraindication to surgery.<sup>16</sup> Some physicians could have witnessed “temporary” symptom improvements in patients with BDD, or may have treated patients with mild symptoms. Surgeons may also have been unaware of the patients' preoccupation with other “defects,” and thus understandably limited their focus to the body part for which treatment was desired.

Because of the secretive nature of BDD, it is not uncommon for BDD symptoms to go undetected until after procedures are performed. In the aforementioned survey, surgeons underestimated the rate of BDD in cosmetic settings (~2%), and 84% reported having operated on a patient only to realize postoperatively that they had BDD.<sup>16</sup> 82% of surgeons who had treated patients with BDD noted poor postoperative outcomes.<sup>16</sup> Our results are consistent with these clinical observations of poor cosmetic treatment outcomes in patients

with BDD. Furthermore, individuals with BDD may “doctor shop,” and in today’s competitive market may have found a physician willing to perform the requested procedure.

Our study has several limitations--namely, its retrospective, cross-sectional design. In addition, data were obtained only from subjects, not physicians, and were not verified by medical record review. We do not know whether physicians were aware of patients’ BDD diagnoses prior to performing procedures. However, the procedures requested by patients were specifically for BDD concerns that occurred after onset of the disorder. We did not determine the nature of remaining BDD symptoms after surgical/MI treatment. Furthermore, we did not determine when (how long ago) procedures were received, and the duration of temporary improvement was not quantified. Prospective studies of treatment outcome are needed. Randomized clinical trials would provide the most definitive data but are unlikely to be done because of ethical concerns (e.g., likelihood of poor treatment outcomes;<sup>21</sup> potential for violence<sup>16,18</sup> and suicide<sup>43</sup> among persons with BDD).

Despite these limitations, this study provides new and more detailed information about receipt and outcome of surgical/MI procedures in BDD. Our sample was diverse as it included persons who were not currently receiving psychiatric treatment, which increases the generalizability of our findings. Future studies are needed to address this study’s limitations and further investigate this important topic. In the meantime, physicians need to be aware that psychiatric treatments (i.e., serotonin reuptake inhibitors and cognitive behavioral therapy) appear to be effective for this often-debilitating disorder.<sup>44, 45</sup>

## Acknowledgments

This project was supported by Award Number R01MH060241 from the National Institute of Mental Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Mental Health or the National Institutes of Health.

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**Table 1**  
Demographic and Clinical Characteristics of Participants Who Received or Did Not Receive Surgical/MI Procedures

Variable <sup>†</sup>	Surgery/MI Received (n=42)	Surgery/MI not Received (n=158)	Statistic	df	p value	Effect size
Age (years)	37.2 ± 9.9	31.4 ± 12.3	t = -3.20	78.7	0.002	d = 0.49
Gender (% female)	32 (76.2%)	105 (66.5%)	X <sup>2</sup> = 1.46	1	0.227	v = 0.09
Race (% white)	39 (92.9%)	132 (84.6%)	X <sup>2</sup> = 1.91	1	0.167	v = 0.10
Ethnicity (% Hispanic)	3 (7.3%)	11 (7.4%)	^		1.000	v = 0.001
Employed (current)	30 (71.4%)	92 (58.2%)	X <sup>2</sup> = 2.43	1	0.119	v = 0.11
On disability due to BDD (current)	6 (14.3%)	9 (5.7%)	Wald = 1.92	1	0.166	2.22 (95% CI=0.72-6.83)
BDD severity (BDD-YBOCS score) (current)	24.7 ± 11.1	28.4 ± 9.7	t = 2.11	198	0.036	d = 0.36
Delusional (BABS score) (current)	13.4 ± 7.4	15.9 ± 6.4	t = 2.14	189	0.034	d = 0.31
Delusional (SCID-IV) (lifetime)	32 (76.2%)	122 (77.2%)	Wald = 0.001	1	0.976	1.01 (95% CI = 0.45-2.29)
Number of body parts of concern (lifetime)	6.6 ± 5.2	6.3 ± 4.7	F = 0.31	1,197	0.581	Partial η <sup>2</sup> = 0.002
Age at BDD onset (years)	16.4 ± 5.8	16.4 ± 7.3	F = 0.001	1,198	0.976	Partial η <sup>2</sup> = 0.002
Duration of illness (years)	20.2 ± 12.3	14.6 ± 12.1	F = 0.46	1,197	0.498	Partial η <sup>2</sup> = 0.002
Housebound due to BDD (lifetime)	16 (38.1%)	38 (24.2%)	Wald = 2.41	1	0.121	1.79 (95% CI = 0.86-3.74)
Major depressive disorder (lifetime)	33 (78.6%)	116 (73.4%)	Wald = 0.29	1	0.592	1.26 (95% CI=0.55-2.89)
Suicidality (lifetime)						
Suicidal ideation	33 (78.6%)	123 (77.8%)	Wald = 0.04	1	0.846	0.92 (95% CI = 0.39-2.16)
Suicidal ideation attributed to BDD	25 (59.5%)	85 (53.8%)	Wald = 0.09	1	0.768	1.11 (95% CI = 0.55-2.26)
Suicide attempts	14 (33.3%)	41 (25.9%)	Wald = 1.49	1	0.223	1.60 (95% CI = 0.75-3.42)
Suicide attempts attributed to BDD	8 (19.0%)	17 (10.8%)	Wald = 2.20	1	0.138	2.05 (95% CI = 0.79-5.30)

For lifetime variables, it is not known when the variables occurred (for example, suicide attempts) in relation to when surgery/MI was received.

<sup>†</sup> Results are presented as mean ± SD or n (%)

<sup>^</sup> Fisher's exact test utilized

**Table 2**

Subjects Perceptions of Longer-Term Treatment Outcome of Received Surgery/MI Procedures (n = 87) Versus All Other Procedures (n = 327)<sup>†</sup>

Variable and Outcome	Surgery/MI		Other		Statistic <sup>‡</sup>	p	ES
	N	%	N	%			
<b>Appearance of Treated Body Part</b>					X <sup>2</sup> = 2.58	0.11	0.08
<i>Improved</i>	29	33.3	81	24.8			
<i>No Change or Worse</i>	58	66.7	246	75.2			
<b>Preoccupation with Treated Body Part</b>					X <sup>2</sup> = 4.44	0.04	0.1
<i>Improved</i>	22	25.3	51	15.6			
<i>No Change or Worse</i>	65	74.7	276	84.4			
<b>Overall BDD Symptoms</b>					Fisher's exact	0.75	0.04
<i>Improved</i>	2	2.3	13	4.0			
<i>No Change or Worse</i>	85	97.7	313	96			

<sup>†</sup>Treatment outcome is reported by procedure, not by subject. In our previous paper (Crerand, et al., 2005), the total number of received procedures was reported as 419. Due to missing outcome data for 5 procedures, n = 414 in this table. Other procedures include dermatologic, dental, paraprofessional (e.g., electrolysis), and other medical treatments (e.g., diet pills).

<sup>‡</sup>df = 1 for all statistics reported

**Table 3**  
Reasons Sought Procedures Were Not Received (Surgery/MI vs. Other Cosmetic Procedures)

Reason	Surgery/MI (n = 61)		Other (n = 47) <sup>†</sup>		Statistic <sup>‡</sup>	P	ES
	N	%	N	%			
Cost	18	29.5	3	6.4	X <sup>2</sup> = 9.06	0.003	0.29
Doctor Refused	16	26.2	24	51.1	X <sup>2</sup> = 7.02	0.008	0.26
Fear	11	18.0	7	14.9	X <sup>2</sup> = 0.19	0.66	0.04
Talked out of treatment <sup>§</sup>	9	14.8	2	4.3	Fisher's exact	0.11	0.17
Other <sup>§§</sup>	7	11.5	11	23.4	X <sup>2</sup> = 2.72	0.10	0.16

<sup>†</sup> n = 108; missing data for one procedure

<sup>‡</sup> df = 1 for all statistics

<sup>§</sup> After seeking cosmetic treatment from a professional, the subject was talked out of getting the treatment by someone other than the professional from whom they had sought treatment (e.g., a friend or family member).

<sup>§§</sup> Other reasons include: not liking the doctor, gathering information only, pregnancy, subject changed his mind.