

Neuropsychological Findings in Silicone Breast-Implant Complainants: Brain Damage, Somatization, or Compensation Neuroses?*

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ABSTRACT

Seven consecutive cases of women claiming a variety of ailments and disabilities which they related to their breast implants are presented. None of the patients had any objective medical findings documenting these impairments. Four of the 7 patients performed poorly on neuropsychological tests. All 4 of these were felt to be motivated to perform poorly on forced choice measures of cooperation. The remaining 3 patients performed within normal limits on the neuropsychological tests. All 7 patients scored above critical limits on at least two MMPI-2 clinical scales. One patient was depressed and the rest presented as overly hypochondriacal and hysterical. These data indicate that the rates of psychiatric disorder, symptom magnification, somatization, and/or malingering may be quite high in breast-implant complainants.

Silicone breast implants have been purported to cause a wide variety of medical conditions (Gabriel et al., 1994). These include a variety of connective tissue disorders, such as rheumatoid arthritis, fibromyalgia, polymyalgia, systemic lupus erythematosus, Sjogren's syndrome, dermatomyositis, polymyositis, systemic sclerosis, and vasculitis. Other associated disorders have included Hashimoto's thyroiditis, primary biliary cirrhosis, sarcoidosis, and cancer other than breast cancer. Breast implants also have been purported to cause a variety of neurologic conditions that have been combined under the label "atypical neurologic disease syndrome". These include polyneuropathies, a multiple sclerosis-like syndrome, an amyotrophic lateral sclerosis-like syndrome, and disease of the neuromuscular junction.

Documentation in the medical literature of these conditions and their relationship to breast implants has been entirely anecdotal (e.g., Fock,

Feng, & Tey, 1984; Marik, Kark, & Zambakides, 1990). However, when a comprehensive review of these anecdotal reports was conducted, no differences were found between the presentation of women with breast implants and other patients whose conditions were deemed idiopathic (Sanchez-Guerrero, Schur, Sergent, & Liang, 1994).

In 1992 the Food and Drug Administration (FDA) removed silicone-gel breast implants from the market (Kessler, 1992). This action was not taken because breast implants posed any known risk, but because the manufacturers had not fulfilled their responsibility to collect data on the question. This FDA action was presented in the media as a determination that the FDA had found the implants to be dangerous (Angell, 1994). In spite of the lack of published epidemiologic studies at the time, the anecdotes, media reports, and the action of the FDA may have convinced judges and juries to award a number

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of multi-million dollar settlements (Feder, 1994; Naik, 1994).

The four major breast implant manufacturers eventually agreed on the largest product liability class-action settlement in U.S. history, which established a fund of \$4.2 billion to compensate women with implants who later acquired one or more of the specified disorders. Women with implants were promised net payments ranging from over \$100,000 to \$4.5 million, depending upon the severity of their problems (Kolata, 1994).

Despite the class-action settlements, thousands of women opted not to join, and the individual lawsuits continued. Consequently, Dow Corning, one of the implant manufacturers and a primary participant in the class-action settlement, declared Chapter 11 bankruptcy in May of 1995. The viability of this agreement is now highly questionable.

Several epidemiological studies examining the health effects of breast implants have been completed recently. Gabriel et al. (1994) performed an exhaustive retrospective record review of the 749 women who lived in Olmsted County, Minnesota and received breast implants there from 1964 through 1991. These women were compared with 1,498 similar women who had not undergone breast implantation. In addition, 125 women who received their implants as part of their treatment for breast cancer were compared to 306 similar women who were treated for breast cancer but did not receive implants. Only 5 of the 749 women who received breast implants were given a diagnosis of one of the specified connective tissue diseases, as were 10 of the 1,498 controls. Only 2 of the women with breast implants were found to suffer from the central nervous system disorders that were examined, as compared to 4 of the controls. No statistically significant elevations in relative risk for any of the specified conditions were found among the women with breast implants as compared to control subjects.

A larger epidemiological study of this issue examined 87,501 women over 14 years of follow-up, from the Nurses Health Study cohort (Sanchez-Guerrero et al., 1995). The years 1976 through 1990, before there was widespread me-

dia coverage on the possible health effects of breast implants, were considered. Of the 1,183 women who received breast implants, only 3 had received diagnoses of connective tissue disease and none were diagnosed with scleroderma, systemic lupus erythematosus, inflammatory myositis, or Sjogren's syndrome. Only 6 women with breast implants had any of the 41 signs, symptoms, neurological complications, or laboratory findings that were examined, as compared to 898 of the women without implants. No associations were demonstrated between breast implants and these health effects.

A third epidemiological study considered 395,543 female health professionals who completed questionnaires as part of the Women's Health study (Hennekens et al., 1996). A total of 10,830 women reported breast implants and 11,805 reported connective tissue diseases. The relative risk for connective tissue disease among those who reported breast implants was 1.24. The authors felt that these results provided reassuring evidence against a large hazard associated with breast implants. They noted that the chief limitation of their study was the use of self-reported diagnosis between the years 1992-1995, after the publicity in the media regarding the potential adverse health effects of breast implants and the class action lawsuits. No attempt was made to determine subject participation in the litigation.

There is relatively little published research on the neuropsychological deficits reported by women with silicone breast implants. What few reports exist typically involve patients who have been referred pursuant to their legal claims. Klein (1995) detailed findings in 27 breast implant plaintiffs, and reported that testing revealed deficits on measures of verbal and visual memory, word finding, spelling, processing speed, and mental tracking. She attributed these deficits to neurotoxic effects of the patients' breast implants. No measures of emotional functioning or motivation were administered. Nonetheless, it was Klein's subjective impression that involvement in litigation did not play a major role in these patients' presentations.

Similarly, Singer (1995) reported findings on 20 breast implant litigants referred for testing

pursuant to their damages claims against the implant manufacturers. Patients were administered a neurobehavioral symptom survey, two WAIS-R subtests, and an embedded figures test. A demographically-derived estimate of "pre-morbid" IQ was calculated. No measures of emotional adjustment or motivation were administered. Most breast implant patients were judged to perform below acceptable levels on at least one of these measures. Singer concluded that the findings were consistent with reports of "neurobehavioral illness" from breast implants.

Whatley, Mullins, and Hartman (1995) evaluated 5 women with breast implant-related neuropsychological complaints. All patients had Halstead-Reitan Impairment indices in the impaired range. No measures of motivation or cooperation were administered. Interestingly, a majority of the patients had significant MMPI-2 scale elevations reflecting personality disturbance or psychopathology.

By contrast, Pimentel, Green, and Iacono (1995) evaluated 7 patients with multi-systemic complaints attributed to breast implants. They administered a battery of neuropsychological tests that included a malingering battery. They reported that testing revealed diffuse, mild to moderate neuropsychological impairments, but motivation and malingering measures revealed "differential performance", with responses ranging from hysterical to malingered. No other findings were elaborated, and no measures of psychological status or emotional complaints were administered.

Presented below are seven consecutive cases of women claiming a variety of ailments and disabilities which they related to their breast implants. All were referred for neuropsychological testing by their treating physicians.

METHOD

All 7 patients were referred by their treating neurologists or rheumatologists and presented with breast implant-related complaints. They were administered standard clinical neuropsychological evaluations. The evaluations consisted of a clinical interview, several symptom checklists, and a battery of neuropsychological tests. Because patients

were seen in several different clinics, the specific tests that were administered differed slightly. All patients were administered several measures of cooperation and motivation, including the Portland Digit Recognition Test, (PDRT: Binder, 1990, 1993; Binder & Willis, 1991), a forced choice symptom validity assessment procedure. Standardized personality testing was also administered, specifically the MMPI-2 (Butcher et al., 1989; Hathaway & McKinley, 1989). All tests were given according to their respective manual instructions. One additional instruction was given in written or oral form: Patients were asked to answer all interview and test questions as honestly and accurately as possible and to try their best throughout testing.

Identifying information was slightly altered, in order to adequately disguise the patients and protect confidentiality.

Patient 1

Patient 1 was a 32-year-old right-handed woman who developed multiple symptoms and complaints which she attributed to her cosmetic breast implants, which were in place for 8 years. She claimed to suffer from fibromyalgia, chronic pain in her neck and back, swelling, discoloration, and "incredible" pain in her left hand and arm that was attributed to Raynaud's disease, severe migraines, memory loss, confusion, and depression. Prior to evaluation, Patient 1 underwent extensive laboratory studies, including two MRIs of the brain, all of which were interpreted as normal. She was referred for neuropsychological evaluation by her treating neurologist.

Patient 1 reported that she was a moderate consumer of alcohol. Although she was not supposed to smoke cigarettes because of her Raynaud's disease, she had recently resumed smoking. She was taking a variety of prescription medications, including Calan for Raynaud's disease, Zostrix cream which she rubbed on her neck and shoulders for chronic pain, and DHL nasal spray on an as needed basis for migraines. Additionally, she was on several psychotropic medications, including the antidepressant imipramine, which she had been taking continuously since the early 1980s. More recently she had begun taking lorazepam and Zoloft.

Patient 2

Patient 2 was a 52-year-old right-handed woman who underwent reconstructive mammoplasty 11 years prior to this assessment. She complained of a variety of cognitive and physical difficulties which she related to her breast implants. These

included memory loss, forgetfulness, confusion, and disorientation. She reported problems with word finding. She stated that 6 months after her implants were placed, her teeth began to "turn to powder". All of her teeth were eventually removed 4 years after her mammoplasty. She states that around that time she also lost her sense of smell. She complained of suffering from diffuse pain. She reported pain in her left arm. She claimed to suffer from headaches, which felt like "someone put a C-clamp" on her head and pain and a "heavy feeling" in her right leg. She reported that both of her feet were numb, and unless she could see her feet, she was unable to tell when they were touching the ground. She claimed to suffer from chest pain, which was associated with difficulty breathing. In this respect, she reported that she had undergone several EKG evaluations, as well as a treadmill test, which were all normal. She claimed to be unable to feel heat in her hands, and indeed reported that she has burned herself with a cigarette ash without feeling it. On the other hand, she stated that coldness caused her "an extreme ache, like someone stabbing me with a knife". Patient 2 underwent extensive neurologic, neuro-radiologic, and laboratory studies, which were unremarkable or unrelated to her complaints.

Patient 2 had an extensive past medical history. She had suffered from morbid obesity, weighing as much as 350 pounds. She had an ileal by-pass. Apparently, this resulted in some liver damage and was eventually reversed. She regained over 200 pounds and underwent gastroplasty. She also underwent a hysterectomy. She states that she was diagnosed with a cerebral aneurysm, after undergoing an angiogram. However, she also stated that surgery for the aneurysm was never considered, but rather she took a regimen of medication for 1 week, after which her headaches disappeared. She had her gall bladder removed. She underwent a series of breast biopsies for fibrocystic disease. This culminated when she had her breast tissue removed and the implants were placed. She stated that she was diagnosed with Type II diabetes mellitus and treated with insulin. She subsequently discontinued the insulin. She stated that she underwent a lumbar laminectomy for a ruptured disk at the L5-S1 level. She underwent a cervical laminectomy and discectomy at the C5-6 level. Prior to that, she stated that she was diagnosed with thoracic outlet syndrome. She underwent a resection of her first rib on the left, in order to treat this condition. She subsequently had a right first rib resection.

The patient reported that while undergoing an evaluation for Social Security Disability, a psy-

chologist diagnosed a stroke, based on her poor performance during neuropsychological testing. She stated that the administrative law judge awarded her total disability on the basis of a drastic drop in her IQ.

Patient 3

Patient 3 was a right-handed 37-year-old teacher who was referred for testing approximately 5 years after she underwent augmentation mammoplasty. She reported having experienced immediate physical and cosmetic problems after undergoing surgery. She reported that the implants were soon misshapen and misaligned. She reported having suffered physical discomfort, fatigue, night-sweats, and joint pain. The implants were removed about 18 months later, but in the ensuing years she was reportedly troubled by progressive muscle and joint pain, headaches, tinnitus, diplopia, fatigue, and mental inefficiency. She developed episodes of depression, anxiety, and panic attacks. She developed symptoms of connective tissue disease, and was at various times diagnosed as having fibromyalgia, Raynaud's phenomenon, sleep deprivation syndrome, peripheral neuropathy, Sjogren's disease, and systemic lupus erythematosus. However, all neurologic, neuroimaging, and laboratory studies were interpreted as normal.

With respect to past medical history, the patient denied prior head injury, loss of consciousness, seizure, stroke, or other sign or symptom of neurologic insult or disease. She reported having experienced a "temporary paralysis" following a back injury 12 years earlier. She acknowledged a history of anorexia and bulimia, and was in treatment for depression and "obsessive-compulsive disorder" before and after receiving her breast implants.

Patient 4

Patient 4 was a right-handed 55-year-old woman who underwent augmentation mammoplasty with direct injection of silicone approximately 25 years ago. She then underwent reconstructive mammoplasty with silicone-filled implants approximately 12 years before she was referred for testing. Patient 4 complained of progressive muscle and joint pain, headaches, abdominal pain, fatigue, and mental inefficiency. She developed symptoms of connective tissue disease and was diagnosed as having fibromyalgia, myofascitis, and rheumatoid arthritis, although all neurologic, neuroimaging, and laboratory studies were interpreted as normal. Her joint pain was reportedly so severe that she was confined to a wheelchair in the months prior to the present evaluation.

Patient 4 acknowledged a history of alcohol and polysubstance abuse. She also had an extensive psychiatric history with numerous and prolonged psychiatric hospitalizations. There were multiple suicide attempts and self-mutilating behaviors. Past diagnoses reportedly included bipolar disorder and borderline personality disorder. The patient had been sober for approximately 7 years prior to the present evaluation and continued to attend several Alcoholics Anonymous meetings each week.

Patient 5

Patient 5 was a right-handed 60-year-old woman who underwent reconstructive mammoplasty approximately 20 years before the present evaluation. She complained of fatigue, irritability, and cognitive impairment related to rheumatologic disease attributed to her breast implants. Patient 5 arrived at testing with a 15-page hand-written summary of her medical history which included severe headaches, chest-pain, tachycardia, syncope, shortness of breath, nausea, and emesis. She documented multiple medical evaluations, including emergency room visits for these ailments. She complained of visual problems, multiple chemical sensitivities, and allergies to environmental irritants. Patient 5 described a past history of psychiatric evaluation, with treatment for depression and anxiety predating her breast implants. Comprehensive medical and neurologic examination, neuroimaging and neurodiagnostic studies, and laboratory studies were interpreted as normal.

Patient 6

Patient 6 was a right-handed 58-year-old woman who underwent augmentation mammoplasty approximately 30 years prior to the present evaluation. She reported a history of multiple chemical sensitivities and allergies to environmental irritants. She presented with chronic whole body pain, gait disturbance, weakness and incoordination, and gastrointestinal problems that she attributed to her breast implants. She complained of memory difficulties, attention lapses, and driving problems, the

latter predating the present evaluation by nearly 20 years.

This patient's past medical history was remarkable for hypo- and hypertension, allergies, and sinus problems. She reported a history of psychiatric difficulties leading to her entering counseling about 15 years prior to the present evaluation. She denied alcohol use and had never taken psychotropic medication.

Patient 7

Patient 7 was a right-handed 52-year-old woman who underwent augmentation mammoplasty approximately 15 years prior to the present evaluation. She complained of painful parasthesias affecting the lower extremities, joint pain, and multiple allergies. She reported becoming increasingly disorganized and forgetful in recent years. She reported that she was troubled by joint pain and multiple allergies.

Patient 7 described a longstanding psychiatric history, marked by depression and relationship problems. She had been involved in psychotherapy in the past, but had been prescribed antidepressant medications only for pain-related complaints.

RESULTS

Patient 1 was found to be of average intelligence with a marked disparity between her intact verbal skills and borderline-impaired perceptual-motor abilities. WAIS-R (Wechsler, 1981) scores were judged to be well below levels predicted by past academic achievement. There were moderate to severe deficits in most areas of neuropsychological functioning, with bilateral motor impairment, verbal learning defects, and impaired ability to establish, maintain, and shift attention.

Table 1. PDRT Performance in 7 Breast Implant Patients.

	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Pt 6	Pt 7
5" Delay	18/18	11/18	13/18	18/18	4/18	17/18	15/18
15" Delay	9/18	9/18	7/18	12/18	2/18	15/18	15/18
30" Delay	12/36	14/36	14/36	28/36	1/18	20/36	20/36
Total (Cor)	39/72	34/72	34/72	58/72	7/54	52/72	50/72
% Correct	54.2	47.2	47.2	80.6	11.1	72.2	69.4

Performance on the PDRT for all patients is depicted in Table 1. On the 36 "hard" item trial Patient 1 only obtained 12 items correct and committed 24 errors on this forced choice 'memory' procedure ($p < .05$ that she was responding randomly). This suggests that she was motivated to perform poorly on this task.

The individual and averaged MMPI-2 Basic Scale profiles are presented in Figure 1. Patient 1's MMPI-2 Welsh code was 3/2*78/46'-0/59 F"/K/L. The validity scale configuration suggested that the profile may have been invalid, possibly due to an effort to present a false claim of mental illness, acute confusion, or random responding. The rest of her clinical scale profile reflected diffuse elevations, with 7 of 10 T

scores being greater than 70. Her two highest elevations were on Scales Hs and Hy, suggesting the presence of functional overlay and/or a non-organic contribution to her somatic complaints.

Patient 2 also was found to be of average intelligence with a nonsignificant disparity between her average perceptual-motor skills and her low-average verbal abilities. WAIS-R scores were suppressed by her grossly and improbably impaired performance on a measure of simple auditory attention. Throughout the remainder of the test battery, she exhibited gross deficits in psychomotor, memory, attention, and executive skills. Memory test performance was below levels observed in many frankly amnesic patients. In general, Patient 2 performed better on com-

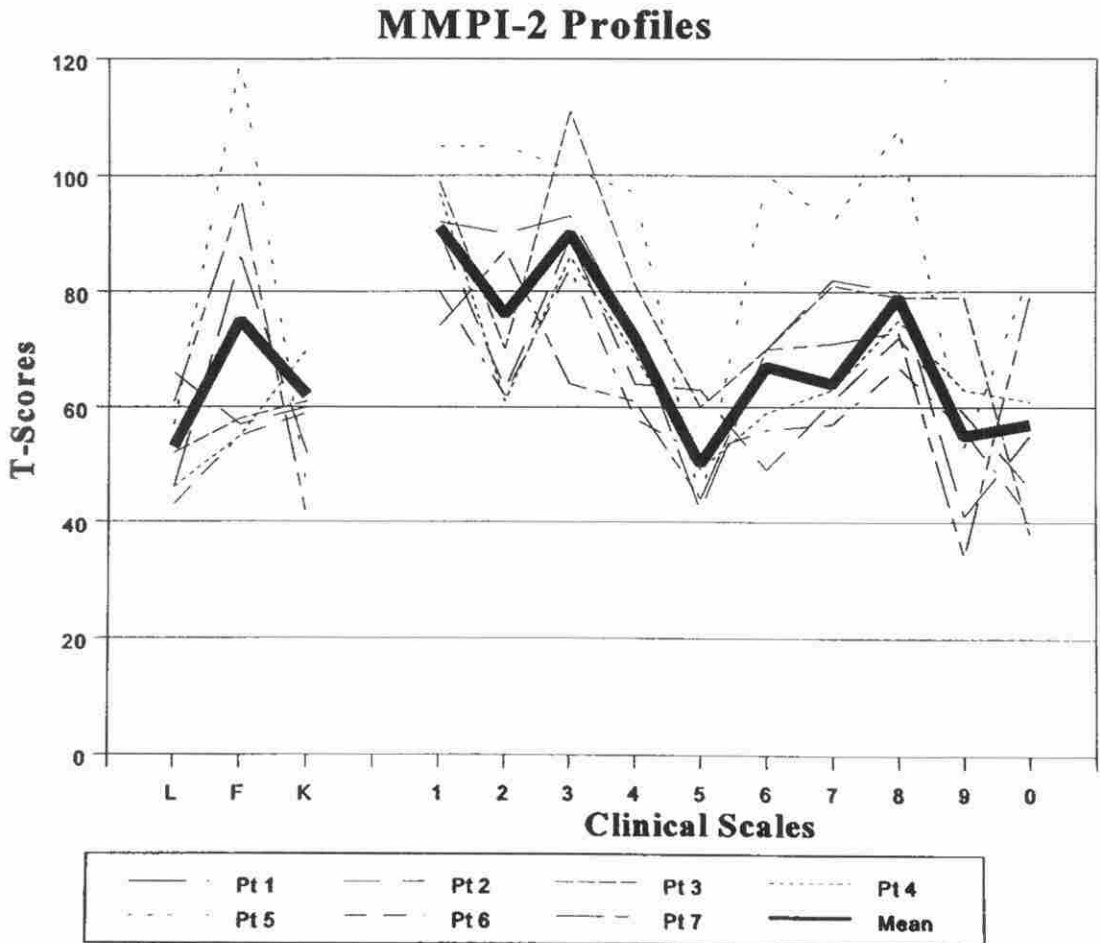


Fig. 1. Mean and individual MMPI-2 profiles in 7 breast implant patients.

plex attentional measures than she did on easier ones.

However, on the 36 "hard" items from the PDRT, Patient 2 made only 14 correct responses and committed 22 errors ($p < .15$ that she was responding randomly). Overall, she had a 47.2% success rate on the PDRT, below the published cut-offs (Binder, 1993) and again, suggestive of motivation to perform poorly.

Patient's 2's MMPI-2 Welsh code was 1*3"8'4257-9/60 LK-F. Her validity scale configuration suggests that she was portraying herself as unusually moral, virtuous, and scrupulous. Her profile was significantly elevated on 4 of 10 clinical scales. Her highest elevations occurred on Scales Hs and Hy, suggesting the presence of functional overlay and/or a nonorganic contribution to her somatic complaints.

Patient 3 was found to be of average to above average intelligence with little disparity between verbal, perceptual-motor and attention-related elements of intellectual ability. There were severe deficits in psychomotor speed, but otherwise average performance on most memory- and attention-related measures.

However, on the final 54 items from the PDRT, Patient 3 made only 21 correct responses and committed 33 errors ($p < .1$ that she was responding randomly). Overall, she had a 47.2% success rate on the PDRT, below the published cut-offs (Binder, 1993) and again, suggestive of motivation to perform poorly.

Patient 3's MMPI-2 Welsh code was 3!2*47"8926'5-0 K-FL. Her validity scale profile suggested a valid assessment of psychological status and personality functioning. Her clinical scale profile depicted her to be nervous, tense, and unhappy. The patient exhibited a great deal of psychological naivete; repression, denial, and somatization are chronic defenses against emotional distress in similar individuals. The MMPI-2 was interpreted as reflecting a high likelihood of physical symptom magnification and risk for somatization or conversion.

Patient 4 was found to be of very superior intelligence with little disparity between her verbal, perceptual, or attention-related abilities. There were no observed deficits in motor, memory, attention, or executive skills.

The patient's performance on the PDRT yielded an 80.6% success rate, well above published cut-offs and suggestive of fully effortful performance. Patient 4's MMPI-2 Welsh code was 1*3"8'47820-6/5 K'FL. Her validity scale profile suggested the presence of some psychological defensiveness. Her clinical profile suggested that Patient 4 was experiencing multiple physical and psychological problems in the context of chronic emotional and characterological impairment.

Patient 5 exhibited gross deficits in the full range of intellectual and neuropsychological functions assessed during her evaluation. On the PDRT Patient 5 obtained only 7 items correct and committed 47 errors, well below the $p < .001$ binomial probability for random responding on this instrument, and strongly suggestive of malingered memory impairment.

Patient 5's MMPI-2 Welsh code was 81236**47*0"9/5 F!!L/K. Her validity scale configuration suggested an effort to over-report physical and emotional symptoms, acute confusion, or random responding. The resulting MMPI-2 profile was of doubtful validity. The clinical scale configuration reflected possibly disordered thinking, a high level of somatic preoccupation, feelings of severe depression and anxiety, high levels of anger and hostility, and a wide range of unusual or improbable perceptions and experiences.

Patient 6 was found to be of average intelligence with relative strengths in some verbal and attention-related abilities. There were no observed deficits in higher cognitive functioning; memory- and attention-related skills were judged to be fully intact. Patient 6's performance on the PDRT yielded a 72.2% success rate, above published cut-offs and suggestive of effortful performance.

Patient 6's MMPI-2 Welsh code was 31"82-47695/0 KF/L. Her validity scale profile was judged to be nondefensive. Her clinical scale profile revealed a high degree of somatic preoccupation and health-related concerns. In similar patients, repression, denial, somatization, and frank conversion may be excessive defenses against the direct experience of affective discomfort.

Patient 7 was found to be of average intelligence with little disparity among verbal, perceptual, and attention-related elements of intellectual ability. There were few deficits in psychomotor skills, memory, attention, or executive skills. What deficits were observed appeared on easier, rather than more difficult, attention-related measures.

Patient 7's performance on the PDRT yielded a 69.4% success rate, above published cut-offs and did not demonstrate poor motivation during test performance. *Patient 7's* MMPI-2 Welsh code was 2⁰/1876³4-5:9 F*L-K. Her validity scale profile suggested that she may have over-reported psychopathology, been confused or had difficulty reading the test questions, or suffered from extreme psychiatric disturbance. Her clinical scale profile depicted her to be nervous, tense, and unhappy. She described many of the emotional, behavioral, and cognitive symptoms of depression. In similar patients, vegetative symptoms of affective distress sap intellectual efficiency and thwart successful everyday functioning.

DISCUSSION

All of these patients presented with many of the subjective symptoms and complaints that have been deemed compensable according to the terms of the settlement of the breast implant class-action lawsuit. These consisted of a multiplicity of subjective complaints across a variety of physiologic systems. None of these patients had any objective medical, neurologic, or neuroimaging findings documenting these impairments.

Patients 1, 2, 3, and 5 exhibited moderate to severe deficits during neuropsychological testing. The pattern of performance was generally inconsistent with that seen in neurologically-based brain disorders. However, all 4 were found to be motivated to perform poorly during the neuropsychological testing, because of substandard or below-chance responding on the PDRT. All had a pattern of indiscriminant symptom/complaint endorsement across multiple self-report checklists and scales. The MMPI-2 pro-

files for all 4 of these patients suggested the presence of significant functional (nonorganic) components to their somatic complaints, and were judged to reflect high levels of character pathology and chronic emotional impairment. This constellation of findings was consistent with exaggeration of symptoms in pursuit of financial gain, which has been termed "compensation neurosis" (Miller, 1961, 1966; Miller & Cartlidge, 1972; Youngjohn, Burrows, & Erdal, 1995).

Patients 4, 6, and 7 performed within normal limits during neuropsychological testing and were not found to be motivated to perform poorly during testing. However, all 3 of these patients also exhibited significant emotional difficulties on the MMPI-2. In the case of *Patient 7*, the reported symptoms corresponded to those seen in major affective disorders; in *Patients 4* and *6*, there was evidence of somatization and physical symptom magnification in the context of longstanding emotional distress.

Our results failed to document unequivocal neuropsychological impairments in any of these breast implant patients with neuropsychological complaints. Rather, there appeared to be strong functional (nonorganic) contributions to their symptom patterns. These functional causes appear to have been split between characterological and/or somatization dysfunctions and malingering.

Pennebaker (e.g., Pennebaker, 1994) has suggested that the reporting of physical symptoms is influenced to a large degree by psychological processes. He has presented a model explaining the genesis of such poorly defined conditions as "iron-poor blood", "chronic fatigue syndrome", and "multiple chemical sensitivity syndrome". He describes the process of mass psychogenic illness (MPI), whereby groups of associated persons have reported related sets of symptoms with no clear organic basis (Colligan, Pennebaker, & Murphy, 1982). Empirical research has demonstrated that people are frequently poor at accurately detecting internal physiologic activity, with their beliefs dictating where and how they attend to their bodies. Controlled laboratory investigations have shown gender differences in symptom reporting, with

females being more likely to base their symptom reports on external, rather than internal, cues. Finally, persons experiencing negative affect, such as depression or anxiety, or those with past histories of emotional trauma, report more physical symptoms than those who do not. The findings in our series of breast implant complainants suggest that similar processes appear to be operating in this population.

The present cases also highlight some of the weaknesses of neuropsychological methods within a medical/legal context (Faust, Ziskin, & Hiers, 1991). Specifically, it is difficult to elicit patients' full cooperation and best efforts for success on neuropsychological tests when they are likely to be rewarded with large sums of money for poor neuropsychological test performance. The presence of personality and emotional disturbances can further obscure the meaning of neuropsychological test findings. Consequently, neuropsychologists are urged to be cautious in the interpretation of their test results, when administered in a potential medical/legal context (Larrabee, 1990). Particular caution and skepticism are urged when confirmatory objective medical findings are minimal or absent.

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