

## Special Topic

# Self-Reported Breast Implant Illness: The Contribution of Systemic Illnesses and Other Factors to Patient Symptoms

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## Abstract

Patients with self-reported breast implant illness (BII) report a range of systemic symptoms which they attribute to having breast implants. The etiology of self-reported BII is unknown. Some patients have limited resolution of symptoms despite implant removal, and the mechanism of persistent symptoms is unclear. Notably, there are a number of prevalent, chronic systemic illnesses and other factors which present with the most common physical symptoms of self-reported BII. Fibromyalgia, chronic fatigue syndrome, autoimmune disorders, and hypothyroidism often produce fatigue, joint and muscle pain, “brain fog,” anxiety or depression, and hair loss in affected patients who may or may not have breast implants. Other factors such as anxiety with or without depression, perimenopause, aging, cigarette smoking/marijuana use, and prominent side effects from common medications are known to produce similar symptoms as those reported by patients concerned with BII. The possibility that patients with breast implants have an undiagnosed, chronic illness unrelated to breast implants should be considered as well as other factors which may produce similar symptoms. Plastic surgeons should be aware of the range of illnesses and factors which can produce physical symptoms similar to those of patients with self-reported BII. For patients in which a systemic illness or other factor is felt to play a contributory role to self-reported BII symptoms, referral to an internist or rheumatologist for a thorough history and physical examination to rule out conditions may be prudent before explantation. This may reduce the need for explantation if the etiology of systemic symptoms is found to be unrelated to breast implants.

## Level of Evidence: 3

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Patients reporting symptoms that they attribute to their breast implants have been named, through social media, breast implant illness (BII). The etiology of this potential condition is unknown, although recent studies have shown the contribution of psychological factors and the fact that many, but not all, patients improve with the removal of their breast implants.<sup>1-3</sup> Glicksman et al recently reported significant but incomplete symptom improvement in self-reported BII patients 6 months post explantation and

capsulectomy with a reduction of 68% in the number of symptoms reported.<sup>1</sup> However, patients in this study undergoing mastopexy without any history of a breast implant

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reported an increase in symptoms such as anxiety, hair loss, memory, and brain fog, typically believed to be associated with self-reported BII. Spit et al reported significant improvement in systemic symptoms in 43% of patients, with moderate improvement in 24%, and no improvement or worsening of symptoms in 33% of females undergoing explantation for self-reported BII.<sup>2</sup> Newby et al studied patients who underwent previous explantation for self-reported BII and demonstrated poor resolution of symptoms, with elevated levels of ongoing depression, hair loss, rash, fatigue, memory problems, insomnia, and joint pain compared to females without a history of BII and breast implants in place.<sup>3</sup> Although many studies have demonstrated notable improvement in reported symptoms postexplantation,<sup>1-5</sup> some patients have not had complete symptom resolution postexplantation, while others may have ongoing symptoms postexplantation. These findings suggest the possibility that a secondary condition or causation is present in some patients with self-reported BII.

One of the most complete reports of breast implants and associated health effects was published by the Institute of Medicine, under the National Academy of Sciences.<sup>6</sup> This publication was produced by a multidisciplinary team of scientists and physicians with expertise in all aspects of the broad area of study. In this work, the safety of breast implants was explored through an extensive review of the world literature, interviews with patients, and study of the basic science of breast implants and associated medicine. The toxicology of silicone, immunology of silicone, antinuclear antibody association with implants, rheumatology, connective tissue, and neurological associations with implants were evaluated. In addition, patient concerns and testimony were included in the study. The conclusions of the multidisciplinary committee were that “in most instances, silicone breast implants were not causally related to systemic illness, as such illnesses appear to occur at the same frequency in females with and without implants.” The committee found no evidence of T-cell antigen, no evidence for antisilicone antibodies, and no support for increased antinuclear antibodies.

Over 25 studies were evaluated by the expert panel to investigate any correlation between connective tissue disease or rheumatologic disease and breast implants.<sup>6</sup> Detailed analysis of worldwide published works included reviews, cohort studies, and meta-analysis looking at any correlation between connective tissue disease and rheumatologic conditions, combined or individually (including systemic lupus erythematosus, rheumatoid arthritis, Sjogren’s syndrome, scleroderma, and dermatomyositis) and silicone breast implants. Taken together, these studies did not support an association between connective tissue disease and silicone breast implants.

Evaluation of large epidemiological studies and case series by the expert panel demonstrated no elevated risk for neurological diseases in large cohorts of females with silicone breast implants.<sup>7,8</sup> Careful analysis of case reports suggesting the potential association of silicone implants with neurological disease was found to be flawed by design and contradicted by other medical studies performed with large sample size and better scientific analytical design.

In more recent studies, there have been conflicting reports regarding a relationship between silicone breast implants and connective tissue disease. While the systematic review paper of Balk et al suggested inconclusive evidence about association with long-term health outcomes, the retrospective cohort study of Coroneos et al suggested an increased risk of Sjogren’s syndrome, rheumatoid arthritis, and scleroderma.<sup>9,10</sup> However, the retrospective cohort study of Singh et al found no increased risk of systemic disease.<sup>11</sup> At the present time, it is clear that the variation in the outcome of the recently published studies has been affected by experimental design differences, potential bias, follow-up issues, patient-reported data, confounding variables, and other problems. It makes it difficult to know which studies accurately describe the relationship between silicone breast implants and connective tissue disease.

Based in part on the lack of consistency of published studies and concerns that the public should be more aware of the potential unknown health effects of breast implants, the FDA instituted new requirements for the sale and distribution of breast implants. As of October 2021, the FDA required that implants would be packaged with a boxed warning and require a patient decision checklist in which the physician would review the risks and potential benefits and both the patient and physician would sign. The patient decision checklist included information that some patients have reported systemic symptoms which they attribute to their breast implants, including fatigue, memory/concentration, joint and muscle pain, hair loss weight changes, and anxiety/depression. The FDA acknowledged that “the cause of symptoms and the degree to which they are related to breast implants is unclear, as well as the fact that BII is not recognized as a formal medical diagnosis and there are no specific tests or recognized criteria to define or characterize it.”<sup>12</sup> Therefore, the FDA indicated that there may be a correlation between reported symptoms and breast implants in some patients but indicated that medical science did not have enough information at the present time to make this assertion and that further study is indicated. The FDA did not discuss the role that other systemic diseases may play in producing symptoms and that many diseases or conditions may be playing a role in patient symptomatic complaints.

Even with the recent controversies regarding breast implants, the use of implants has dramatically expanded for both aesthetic and reconstructive breast procedures. In the United States alone, over 365,000 breast augmentation procedures and 148,000 implant-exchange procedures were performed in 2021.<sup>13</sup> Worldwide, over 1.8 million breast augmentation procedures were performed in 2018 alone, making this procedure common and ubiquitous worldwide.<sup>14</sup> With the wide dispersal of both breast implants and common systemic illnesses affecting females, there is likely significant overlap between patients with both breast implants and systemic diseases unrelated to breast implants.

A significant group of patients with self-reported BII symptoms are in their 40s to 50s, and this is the age range in which symptoms may present related to a range of systemic conditions. Many of these patients have not had a work-up by their internist or rheumatologist and self-diagnose after doing research on social media. Chronic diseases such as fibromyalgia, chronic fatigue syndrome, autoimmune disorders, and thyroid disease, among others, may contribute to the systemic symptoms that females with breast implants report. Furthermore, anxiety disorders, perimenopausal changes, and side effects from medications taken for chronic illness contribute further to systemic complaints.

Little is known about the contribution of chronic illnesses or other factors to the presentation of symptoms in self-reported BII. The purpose of this paper is to explore important and common systemic diseases and other factors which may be incorrectly classified as BII or may play an important role in creating systemic symptoms in patients who otherwise may have localized breast implant-associated problems.

## METHODS

The PubMed (National Institutes of Health, Bethesda, MD), Google Scholar (Mountain View, CA), and OVID (Wolters Kluwer, Alphen aan den Rijn, the Netherlands) databases were utilized to perform an extensive literature review of appropriate studies published in the English language. The databases were used with a search strategy in which the most common 6 reported systemic symptoms of “self-reported breast implant illness,” in females reported by the FDA<sup>12</sup> were queried (fatigue, joint and muscle pain, “brain fog,” anxiety, and/or depression, hair loss, and rash) and related to known systemic diseases or conditions presenting with similar symptoms. Symptoms were matched to systemic diseases or conditions when at least 5 of 6 symptoms were found in common. The top 4 responses matching BII symptoms to systemic illnesses and the top 4 responses matching BII symptoms to other factors were identified and included in this work.

## THE ROLE OF SYSTEMIC ILLNESSES AND SELF-REPORTED BREAST IMPLANT ILLNESS

### Fibromyalgia

Fibromyalgia is a poorly understood disease that may present in patients with breast implants, without correlation to breast implants.<sup>15</sup> Females are twice as likely to present with this disease as men, with the typical age of presentation between 35 and 45 years of age. Fibromyalgia is one of the most common and debilitating conditions affecting females worldwide, with up to 5% of middle-aged females in the United States reporting symptoms.<sup>16</sup> Although Coroneos et al reported that breast implants were not correlated with fibromyalgia in a large series, it is not known if patients with undiagnosed fibromyalgia are diagnosed with BII erroneously.<sup>10</sup> Common findings in fibromyalgia include fatigue, musculoskeletal pain, depression/anxiety, problems with thinking, memory, and concentration, as well as other symptoms.<sup>16</sup> Many of these symptoms align with symptoms that some patients believe are related to their breast implants. A missed diagnosis of fibromyalgia may explain why some patients who undergo explantation do not have improvement of their symptoms. If patients with self-reported BII symptoms are formally diagnosed with fibromyalgia and treated, it is possible that their symptoms might improve without explantation.

Table 1 presents the 6 most common symptoms of BII as reported by the FDA<sup>12</sup> and compares them to common symptoms of 4 systemic illnesses, including fibromyalgia, chronic fatigue syndrome, undiagnosed autoimmune disease, and hypothyroidism. Each of the symptoms that self-reported BII patients may describe may be found in fibromyalgia patients.

### Chronic Fatigue Syndrome

Chronic fatigue syndrome (CFS) or myalgic encephalomyelitis is a poorly understood, common, and frequently undiagnosed disease affecting over 1 million people in the United States.<sup>17</sup> It is found more commonly in females with the typical age of onset between 30 and 50 years of age. Men can also be affected by this condition; however, it affects females 4 times as often. Onset in the majority of patients appears to be following a viral or bacterial infection but is believed to have an autoimmune basis.<sup>18</sup> This disorder is characterized by extreme fatigue which cannot be otherwise explained and has a duration of over 6 months. Fatigue is not improved with rest. Typical findings include fatigue, memory problems, “brain fog,” depression, weakness, muscle and joint pain, and other symptoms.<sup>19</sup> CFS is a chronic disease that is undiagnosed in the early stages of the disease in over 90% of patients and may present in a patient who has breast implants. No correlation between CFS and the presence of breast implants has been reported. Patients with mild CFS may present to the plastic surgeon with complaints similar to those of BII. Since this

**Table 1.** Common Symptoms of Self-Reported BII, Fibromyalgia, Chronic Fatigue Syndrome, Autoimmune Disorders, and Hypothyroidism

Self-reported breast implant illness	Fibromyalgia	Chronic fatigue syndrome	Autoimmune disorders	Hypothyroidism
Fatigue	Fatigue	Fatigue	Fatigue	Fatigue
Joint and muscle pain	Joint and muscle pain	Joint and muscle pain	Joint pain and swelling	Joint and muscle pain
“Brain fog”	“Brain fog”	“Brain fog”	“Brain fog”	“Brain fog”
Anxiety and/or depression	Anxiety and/or depression	Depression	Anxiety and/or depression	Depression
Hair loss	Hair loss	Hair loss	Hair loss	Hair loss
Rash	Rash and pruritis	Rash reported but uncommon	Rash possible	Hives

BII, breast implant illness.

disease is common, frequently unrecognized, and presents with many of the symptoms of self-reported BII, it is important for the plastic surgeon to know about this syndrome. Recognizing the potential that a patient may have CFS can lead to a referral to a specialist who can further assist with diagnosis and treatment. Breast implant removal may not be necessary if the diagnosis of CFS can be made accurately by a neurologist or rheumatologist specializing in this disorder.

Table 1 presents the overlap of presenting symptoms between self-reported BII and CFS. With the exception of skin rash, which is uncommon in CFS, the main symptoms comparing these conditions are similar.

## Autoimmune Disorders

A range of autoimmune disorders may present in their early course with nonspecific symptoms and may not be accurately diagnosed for a period of time. There are currently over 100 autoimmune diseases recognized.<sup>20</sup> Nonspecific symptoms include anxiety, depression, “brain fog,” concentration problems, fatigue, and hair loss.<sup>21</sup> These symptoms may mirror those seen in patients complaining of BII.

In many autoimmune diseases, symptoms often progress and expand in scope, developing into recognizable autoimmune conditions such as lupus, arthritis, gastrointestinal disorders such as Crohn’s disease, and other conditions. Once progressed, some of these conditions demonstrate the visceral components not seen with self-reported BII, such as kidney disease, pulmonary disease, gastrointestinal disease, and other organ-based problems. However, for patients with breast implants, unrelated, autoimmune disease may present in the presence of breast implants and confound the differential diagnosis. Plastic surgeons should consider the possibility that patients with breast implants may develop unrelated, concurrent autoimmune diseases and consider referral to a qualified rheumatologist who can complete a work-up and help establish a diagnosis.

Table 1 presents the common symptoms presenting in self-reported BII patients and undiagnosed autoimmune

disorders for comparison. Five of the 6 most common symptoms overlap, with the exception of skin rash, which is typically seen specifically in systemic lupus erythematosus.<sup>22</sup>

## Hypothyroidism

Hypothyroidism affects up to 5% of the general population and remains unrecognized in many patients.<sup>23</sup> Most thyroid disorders in the United States are autoimmune in nature and some of the early presentation of these diseases may mimic symptoms reported by patients claiming self-reported BII. The most common form of hypothyroidism in Western countries with adequate iodine intake is Hashimoto’s thyroiditis, with a typical age of onset between 30 and 50 years of age.<sup>24</sup> This condition has a genetic predisposition and is more likely seen when there is a history of familial autoimmune disease. Hashimoto’s disease usually presents with hypothyroidism but can initially present with a period of hyperthyroidism before the gland loses function through the autoimmune-mediated scarring process. Symptoms may vary from person to person and include fatigue, weight gain, joint and muscle pain, hair loss, and depression.<sup>24,25</sup>

Table 1 presents the most common presenting symptoms of self-reported BII and common symptoms of untreated or undertreated hypothyroidism. There is overlap between 5 of the 6 presenting symptoms, with the exception that hypothyroidism more typically presents with hives rather than a formal skin rash.<sup>25</sup>

## OTHER FACTORS WHICH MAY PRODUCE SYSTEMIC SYMPTOMS IN SELF-REPORTED BII PATIENTS

### Anxiety Disorders

Anxiety with or without depression may contribute significantly to symptoms of self-reported BII.<sup>1,26,27</sup> Anxiety, with

**Table 2.** Common Symptoms of Self-Reported BII, and the Side Effects of Antidepressants, Thyroid Medications, and Migraine Medications

Self-reported BII	Side effects of antidepressants	Side effects of thyroid medications	Side effects of migraine medications
Fatigue	Fatigue	Fatigue	Fatigue
Joint and muscle pain	Joint and muscle pain possible in early treatment	Joint pain and Stiffness	NA
"Brain Fog"	"Brain fog" possible	Memory problems	"Brain fog"
Anxiety/depression	Anxiety/depression with suboptimal treatment	Anxiety or depression	Anxiety or depression
Hair loss	Hair loss	Hair loss	Hair loss
Rash	Rash unlikely	Allergic rash	Most common with Topamax (Janssen Pharmaceuticals, Inc., Beerse, Belgium)

BII, breast implant illness; NA, not applicable.

or without depression, causes emotional stress and may lead to symptoms associated with activation of the autonomic nervous system, such as sweating, dizziness, shortness of breath, chest pain, insomnia, restlessness, muscle aches, memory loss and difficulty focusing thoughts, and other findings.<sup>28,29</sup> Anxiety disorders that have a depression component can also lead to physical symptoms simulating those in self-reported BII, including fatigue, muscle/joint pain, headache, weight loss, difficulty concentrating, and other symptoms.<sup>30,31</sup> Patients with anxiety may also demonstrate a nocebo effect, because they may attribute their breast implants as a negative health factor psychologically based on social media reports, thereby creating physiologic symptoms. It has also been postulated that a placebo effect associated with implant removal of breast implants may be playing a role in patients with anxiety.<sup>32</sup>

An anxiety disorder by itself can produce many of the symptoms described by patients reporting BII symptoms and is commonly noted in self-reported BII patients.<sup>1,20,21</sup> Due to the significant overlap in symptoms, it may not be possible to separate which symptoms may be related to self-reported BII and which are related to the anxiety disorder. If it is suspected that anxiety is poorly controlled and may be playing a significant role in the production of physical symptoms, referral to a mental health specialist should be considered.

Table 2 presents the extensive overlap in symptoms between self-reported BII and anxiety/depression disorders. Compounding the significant overlap in reported symptoms is the fact that anxiety has been found to be present in many patients presenting with BII.<sup>1</sup>

## Perimenopause/Aging

Females entering perimenopause may develop a constellation of symptoms which may mirror self-reported BII

complaints. Common symptoms include mood changes, anxiety, depression, difficulty concentrating, joint or muscle aches, sleep disturbance, and other symptoms.<sup>33</sup> The typical perimenopausal symptoms of hot flashes or night sweats are not seen in all females undergoing these changes,<sup>34</sup> and, therefore, perimenopause may not be recognized as a source of the problem in patients who are concerned that their breast implants are causing their symptoms. Patients with preexisting anxiety and depression who develop early perimenopausal symptoms and who are active on social media may attribute the normal physiological and hormonal changes of reduced estrogen levels in perimenopause as evidence of self-reported BII.

Early perimenopause can present with symptoms associated with decreasing estrogen levels. These symptoms may mirror some of the most common symptoms associated with self-reported BII. These very early changes may precede more recognizable symptoms such as hot flashes and may be misinterpreted as a breast-related issue. In patients in which breast implants are associated with capsular contracture or other pain-related conditions related to the implants, the overlay of perimenopause and breast issues may create a false diagnosis of BII.

The natural process of aging, accelerating in menopause, can also produce many of the symptoms reported by patients with self-reported BII.<sup>35</sup> These changes are consistent with the reduction of serum estrogen levels and the physiological effects of chronologic aging. The most common symptoms reported in menopause include vasomotor symptoms, sleep disturbance, fatigue, mood disorders including depression, cognitive changes including memory loss, joint pain, and hair loss. Most females demonstrate one or more age-related menopausal symptoms, whether or not there are breast implants present. This makes it unclear what part of a self-reporting BII patient's symptoms may be attributable to the hormonal



changes associated with perimenopause or menopause, rather than a specific effect from breast implants. Plastic surgeons should keep in mind the normal, physiological progression of aging and consider the symptoms of aging and menopause when evaluating patients with potential BII complaints. Further study of aging and systemic symptoms in the presence of breast implants is warranted. Table 2 presents that perimenopause/aging can present with symptoms much like self-reported BII, with the exception that the skin changes in perimenopause are more associated with dryness and pruritis rather than a skin rash.<sup>28</sup>

## ADVERSE EFFECTS OF PRESCRIPTION MEDICATIONS TAKEN FOR CHRONIC ILLNESSES

Side effects of prescription medications are extremely common and may mirror other disease conditions. Currently, 51% of the US population takes at least one medication for a chronic health condition.<sup>36</sup> Patients presenting with breast implants with or without breast-specific symptoms may manifest systemic side effects of prescription drugs which may mimic reported BII symptoms. For example, migraine medications, which are used for migraine disorder and taken routinely by millions of females, are associated with the common side effects of mood change, brain fog, fatigue, difficulty concentrating, memory issues, and other side effects.<sup>37</sup>

The most frequently prescribed medications for chronic conditions affecting females include antidepressants, thyroid medications, and migraine medications.<sup>38,39</sup> These 3 distinct groupings of medications can produce side effects including anxiety, memory problems, insomnia, and other symptoms which are similar to those self-reporting BII symptoms. The most frequently prescribed agent for females below 50 years of age in the United States are antidepressants which also may be used to treat anxiety.<sup>39</sup> These medications frequently require dosing adjustments and are associated with many known side effects.<sup>40</sup> Patients with hypothyroidism are typically treated with Synthroid (Abbvie, North Chicago, IL), which requires dosing optimization by monitoring thyroid-stimulating hormone (TSH) levels.<sup>41</sup> Side effects of Synthroid are common until a steady state of TSH is reached and maintained. Migraine disease is commonly treated with triptans, such as sumatriptan or rizatriptan, while chronic migraine may be treated with topiramate (Topamax). Triptans work by binding to vascular serotonin receptors in the brain and producing vasoconstriction, while topiramate has gamma-aminobutyric acid and glutamate receptor activity.<sup>42</sup> Both of these medication classes often produce significant side effects which may overlap with self-reported BII symptoms, including fatigue, memory issues or “brain

**Table 3.** Common Symptoms of Self-Reported BII, Anxiety/Depression Disorders, and Perimenopause/Aging

Self-reported BII	Anxiety/depression disorders	Perimenopause/aging
Fatigue	Fatigue with depression	Fatigue
Joint and muscle pain	Joint and muscle pain with depression	Joint and muscle pain
“Brain fog”	“Brain Fog” with either anxiety or depression	“Brain fog” common in perimenopause and menopause
Anxiety and/or depression	Anxiety or depression with suboptimal treatment	Anxiety and/or depression
Hair loss	Anxiety linked with hair loss	Hair loss
Rash	Anxiety may produce rash or hives	Skin dryness and pruritis

BII, breast implant illness.

fog,” and anxiety.<sup>43,44</sup> Reviewing patient medications or referral to the prescribing physician to evaluate a prominent side effect from a prescription medication is an important role for the plastic surgeon and may help rule out symptoms that are not related to the presence of breast implants.

Three of the most common prescription medication classes for chronic illnesses in females 30 to 55 years of age are presented in Table 3. The most common symptoms in self-reported BII patients are presented along with the common side effects which may be experienced by patients taking prescription medications in these drug classes.

## Consumption: Cigarette Smoking, Marijuana Use, and Dietary Contributions to Systemic Symptoms

Several studies suggest an association between smoking and diet and self-reported BII symptoms. Wixtrom et al noted a higher incidence of marijuana use in females self-reporting BII symptoms compared to controls as well as the fact that more females with BII symptoms smoked cigarettes than controls.<sup>45</sup> Cigarette smoking is known to be associated with increased rates of fatigue and depression<sup>46</sup> and is known to increase the risk of joint pain and cartilage loss within joint structures.<sup>47</sup> Marijuana use has been shown to produce “brain fog,” cognitive decline, anxiety, depression, fatigue, and hair loss with regular use.<sup>48-50</sup> The studies reporting adverse reactions to smoking in the literature do not evaluate the presence of breast implants as a variable; however, the fact that these changes occur

in both males and females worldwide makes it unlikely that the symptoms associated with smoking are dependent on the presence of breast implants. Further study of the association between the adverse symptoms of smoking and the presence of breast implants is needed.

Diet has also been reported to be associated with self-reported BII symptoms. Gluten sensitivity and wheat allergy were found to be statistically higher in patients with self-reported BII symptoms compared to patients undergoing silicone implant exchange or mastopexy in a recent prospective study.<sup>45</sup> Nonceliac gluten sensitivity can present with many of the symptoms of autoimmune celiac disease, although the mechanism of this condition is unclear.<sup>51</sup> It is more common in females, typically in the fourth decade of life, with prevalence varying from 1% up to 13% of the general population. Symptoms may include fatigue, headache, anxiety, abdominal pain, irritable bowel syndrome symptoms, and depression.<sup>52,53</sup> Wheat allergy was also found to be elevated in patients with self-reported BII. Wheat allergy is mediated through immune food allergy mechanisms, primarily affecting the skin, gastrointestinal tract, and respiratory tract and does not overlap extensively with BII symptom complaints.<sup>54</sup>

## CONCLUSIONS

Systemic illnesses often produce symptoms similar to those described by patients with self-reported BII. Patients may be concerned that their breast implants are causing them illness when in fact they may have symptoms from a chronic illness, not yet diagnosed. In some patients, a combination of a known systemic illness and symptoms related to their breast implants may create a synergism, exacerbating overall symptoms. Patients with breast implants may also have a known, diagnosed, chronic illness but do not associate those symptoms with their diagnosed condition. Other factors, such as anxiety disorders, medication side effects, perimenopausal, and age-related changes, can also produce symptoms that patients may assume are implant related. Patients who have implant-associated problems such as capsular contracture or breast pain and who also have systemic symptoms from an unrelated illness or other factors may believe that they have BII because they have symptoms that are both systemic and local. In these cases, patients may only have a local problem, correctable with a revisional breast procedure.

The current paper focused on several of the most common systemic illnesses and factors affecting females in the 30- to 55-year-old age group which may be contributing to symptoms that patients with breast implants may experience. There are many potential systemic illnesses and many additional factors which may produce similar symptoms. The purpose of the work presented here is to

encourage plastic surgeons and other medical specialists to consider the range of potential contributing factors to presenting symptoms, so that patients concerned about self-reported BII can be appropriately evaluated and counseled.

Plastic surgeons should be patient advocates and carefully evaluate patient symptoms and concerns. It is the right of any of our patients to ask for explanation, regardless of reason. It is our duty to be good listeners, provide scientifically based answers to patient questions and concerns, and remain an advocate for our patients. It is also helpful to explain and show patients typical results of explanation, especially if there is little breast tissue present following explanation, and to outline reconstructive options. It is also suggested that if a patient has symptoms suggestive of a systemic illness which may be masked as self-reported BII, a thorough history and physical examination be performed by an internist or rheumatologist to rule out other conditions as outlined in this paper, before explanation.

In conclusion, systemic illness and other factors may play a major role in producing some of the symptoms that patients attribute to their breast implants. Plastic surgeons should be aware of the many potential causes of systemic symptoms and conduct a thorough interview with patients discussing their medical history, medications, and presenting symptoms. If a patient presents with self-reported BII symptoms and is concerned about the potential changes or deformity associated with implant removal, it may be helpful to refer the patient to the appropriate specialist to rule out other etiologies for systemic symptoms. This may help reduce the need to remove breast implants which may not be the cause of systemic symptoms in some patients.

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