

## Breast Implant Removal Surgery: A Data-driven Look at Growing Trends

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**B**reast implant removal surgery (BIRS) has become increasingly common. According to the International Society for Aesthetic Plastic Surgery, the number of worldwide BIRS procedures nearly doubled from 2017 to 2022, with more than 320,000 patients undergoing BIRS annually.<sup>1</sup> The demand for BIRS is escalating at a pace surpassing that of other mammoplasties, heralding a potential paradigm shift in how patients perceive breast implants. We analyzed the multi-institutional National Surgical Quality Improvement Program (NSQIP) of the American College of Surgeons (ACS) to understand trends over the last 2 decades and identify potential drivers behind the rise in BIRS.

We identified 2913 female patients who underwent BIRS (CPT codes 19328 and 19330) between 2008 and 2021. BIRS cases increased by 653%—a growth rate significantly faster than that of other breast procedures such as mastectomies (219%) and the overall ACS-NSQIP caseload (363%)<sup>2</sup> (Table 1; Fig. 1). (See figure, Supplemental Digital Content 1, which displays the ratio of the annual number of patients who underwent BIRS to patients who underwent mastectomy as recorded in the NSQIP. The positive gradient indicates that the annual number of

patients who underwent BIRS has increased at a higher rate than the number of mastectomy patients. The straight line represents the best fit, with a positive linear progression and, hence, a clear upward trend. It is essential to recognize that NSQIP data primarily represents procedures performed in larger academic centers, with a focus on insurance-covered procedures. As a result, our analysis may not fully reflect the broader population of women undergoing BIRS, particularly those who received implants for cosmetic purposes. Many of these procedures are performed in outpatient surgery centers that do not participate in NSQIP and are often paid for out of pocket, which may introduce bias in our findings. Future research incorporating data from a wider range of clinical environments, including private surgery centers, could provide a more comprehensive understanding of BIRS trends, <http://links.lww.com/PRSGO/D716>.)

We hypothesize the following 3 main catalysts behind this surge:

1. The caseload of implant-based breast augmentations and breast reconstructions performed each year has been steadily increasing since the 2000s.<sup>1,3,4</sup> The more patients receive breast prostheses, the more implant-related complications occur, which increases the demand for BIRS.
2. In 2011, the US Food and Drug Administration (FDA) first identified a possible link between textured silicone implants and anaplastic large cell lymphomas (ALCL). Although BIRS in asymptomatic patients is not currently recommended by the FDA, many patients reportedly opt for elective BIRS to minimize their future risk of developing breast implant-associated ALCL. Interestingly, this chronological dimension is also mirrored in our analysis, with the BIRS caseload increasing steeply in the decade following the FDA's announcement—presumably due to the spreading awareness and recognition of breast implant-associated ALCL.
3. The increasing propagation and online media dissemination of the “breast implant illness” (BII) syndrome. BII is not yet recognized as an official diagnosis, but the umbrella term encompasses a wide array of adverse systematic symptoms believed to be associated

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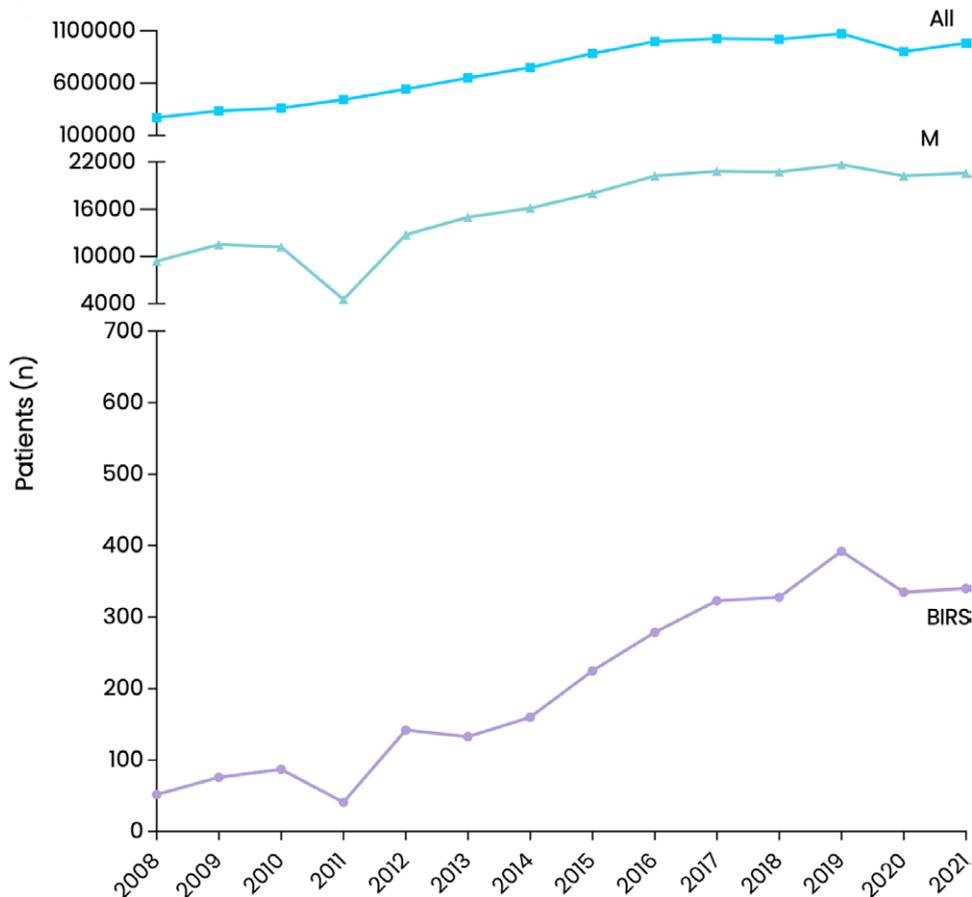
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**Table 1. Breakdown of Annual BIRS Cases Recorded in the ACS-NSQIP Database Compared to the Total Annual Caseload in the ACS-NSQIP Database and Mastectomy Patients<sup>2</sup>**

Year of Surgery	BIRS	ACS-NSQIP	Mastectomy
2008	52	271,368	9,399
2009	76	336,190	11,547
2010	87	363,431	11,225
2011	41	442,149	4,561
2012	142	543,885	12,786
2013	133	651,490	15,000
2014	160	750,397	16,138
2015	225	885,502	18,006
2016	279	1,000,393	20,226
2017	323	1,028,713	20,834
2018	328	1,020,511	20,740
2019	392	1,076,411	21,685
2020	335	902,968	20,218
2021	340	983,851	20,592

Between 2008 and 2021, the overall NSQIP caseload increased by 363% (from 271,368 cases in 2008 to 983,851 in 2021), whereas mastectomy cases rose by 219% (from 9,399 cases in 2008 to 20,592 in 2021). The number of BIRS cases saw a higher growth of 653% during the same period (from 52 cases in 2008 to 340 in 2021).



**Fig. 1.** Graphical representation of the trends in annual BIRS procedures (purple) compared with the total number of cases in the ACS-NSQIP database (“All,” light blue) and the annual number of mastectomy (“M”; turquoise) patients. The exact procedural statistics are presented in [Table 1](#).

with breast implants.<sup>5</sup> Faced with this impaired quality of life, patients who attribute their symptoms to BII may seek BIRS, hoping for symptom alleviation and/or restoration of their prebreast implant health

status. Adidharma et al<sup>5</sup> analyzed Google Trends and Twitter data and noted exponentially growing search volumes of BII from 2018 to 2019. Interestingly, we found the number of BIRS procedures to peak in

2019. One could, therefore, assume that social media increasingly popularized the then newly coined term of BII during this time, with this extensive media attention around BII translating into an uptick in BIRS procedures.

Demographic trends, such as an aging population with older implants, may also contribute to the increased case-load. Patients may opt for BIRS without replacement to avoid implant-related complications or because they no longer desire implants. Moreover, cultural shifts toward more natural aesthetics and a move away from the “over-done” look may also be influencing patient choices, reflecting a blend of health concerns, personal preferences, and societal influences behind the growing demand for BIRS.

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**DISCLOSURE**

*The authors have no financial interest to declare in relation to the content of this article.*

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**ETHICAL APPROVAL**

*Ethical approval was obtained from Brigham and Women’s Hospital, MA (IRB protocol no.: 2013P001244).*

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