

# Asian Breast Augmentation: A Systematic Review

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**Background:** Economic, cultural, and regulatory phenomena may explain recent popularization of implant-based augmentation in Asia; but the collective Eastern experience remains limited. Asian surgeons and their patients rely on evidence-based medicine that originates elsewhere and may not be entirely relevant. Distinct anatomic and cultural features of Asian women warrant a tailored approach to breast augmentation. We explore the Asian experience with a thorough exploration of the recent literature.

**Methods:** A literature search was performed for articles written after 2000, of Asian women who underwent augmentation mammoplasty using MEDLINE, Embase, and Pubmed Databases. Technique and outcomes data were summarized.

**Results:** Twelve articles reported outcomes of 2089 women. Korea contributed most series (English language, 7), followed by China (3), Taiwan (1), and Japan (1). Silicone implants were used in 82.1% of women studied, and almost exclusively after 2009. More round (68.9%) than anatomic implants (31.1%) were placed. Non-inframammary (axillary, areolar, and umbilical) incisions were used in 96.9% of cases. Nearly all implants were positioned below the muscle or fascia; subglandular placement accounted for 1.1% of cases. Implant/nipple malposition (1.3%), capsular contracture (1.9%), hematoma (0.6%), and infection (0.2%) rates were reported in most series. Undesirable scarring was the most frequent complication (7.3%), but was reported only in 4 of 12 series.

**Conclusions:** Studies of Asian women undergoing augmentation mammoplasty are limited, often with ill-defined outcomes and inadequate follow-up. As experience accumulates, an expanding literature relevant to Asian women will provide evidence-based guidelines that improve outcomes and patient satisfaction, and foster innovation. (*Plast Reconstr Surg Glob Open* 2015;3:e555; doi: 10.1097/GOX.0000000000000528; Published online 5 November 2015.)

**E**conomic growth, dissolution of stigma, and emerging global standards of beauty has generated an increasing demand for plastic surgery

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in the Far East. Unique preferences, trends, nuances, and anatomies have borne an exciting new chapter in plastic surgery tailored to ethnicity. This is most evident in the facial plastic surgery literature,<sup>1</sup> perhaps because Asian facial distinctions are most evident and facial surgery is more popular in Asia than surgery below the neck.<sup>2</sup> Although the demand for breast augmentation has been<sup>3</sup> and remains lower than in other parts of the world, its popularity is rising and implant-based augmentation is now the most popular method because toxic injectables like polyacrylamide (Ao Mei Ding, “Amazing Gel”, Fu Hua Pharmaceutical Co., Shanghai, China) were banned.<sup>4,5</sup>

Although complications of breast augmentation are indiscriminate of race, distinctive characteristics

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of the Asian breast, healing tendencies,<sup>6</sup> and women's preferences<sup>7</sup> must be recognized. Asian women are stereotypically slim, have smaller breasts and areolae, and larger nipples than their Western counterparts.<sup>5,8,9</sup> Implants chosen are slightly smaller and larger prostheses may be at increased risk for displacement.<sup>10</sup> Asians are prone to hypertrophic and prolonged hyperemic scarring.<sup>6,11</sup> The inframammary fold (IMF) approach to breast augmentation has not gained widespread popularity due to its conspicuous scar; axillary and areolar approaches are preferred in countries where placing a scar on the breast is avoided.<sup>7,12</sup> Whether IMF scarring is sufficiently problematic so that it should be avoided has yet to be determined. Because important differences exist, plastic surgeons and Asian women are entitled to ethnicity-specific evidence-based guidance.

The aim of this systematic review was 2-fold: to review breast augmentation outcomes data published since 2000, compare these data from Western literature, and encourage plastic surgeons in the Far East to publish meaningful data that will guide ethnicity-specific decision-making. As implant-based prosthetic augmentation mammoplasty becomes commonplace in Asia, patients and surgeons are entitled to data that better reflect distinctive anatomic features and desires of Asian women.

## METHODS

A literature search was performed in May 2015 using MEDLINE, Embase, and the Cochrane Database of Systematic Reviews. The search was performed using medical subject headings (MeSH) and keywords. Terms used were: breast implant (*breast implant* or *breast augmentation* or *augmentation mammoplasty* or *augmentation mammoplasty*), Asia (*Asia* or *Korea* or *Japan* or *Taiwan* or *China* or *Vietnam* or *Philippines* or *Thailand* or *Hong Kong* or *Singapore*), and ethnic (*Asian* or *Korean* or *Japanese* or *Taiwanese* or *Chinese* or *oriental* or *ethnic* or *Vietnamese* or *Thai* or *race*), as well as combinations of those terms. The search was restricted to postmillennial studies (January 1, 2000 to May 2015) to limit articles to relevant technologies and methods. Articles not available in English were excluded. Abstracts, review articles, case control studies, and clinical practice guidelines were excluded. Early iterations of repeated series presumed to contain redundant data were also excluded. PRISMA guidelines were respected in the execution and delivery of this systematic review.<sup>13</sup>

### Inclusion Criteria

For each search result, the title, abstract, and authorship panel were screened for potential relevance using the following inclusion criteria: (1) populations studied were defined as Asian or the study was conducted at an Asian institution, (2) patients underwent

elective, noninjectable (silicone, polyacrylamide, etc.), nonautologous breast augmentation, (3) surgical technique was mentioned, (4) the study was longitudinal, and (5) clinical outcomes data were reported. If race was not reported at studies performed at Asian centers, it was assumed that patients were predominantly or exclusively Asian. To ensure all relevant articles were included, a second "pass" was performed using PubMed.

In this added step, a more thorough review of results using more specific queries was performed. Filters used were date published (January 1, 2000 to May 13, 2014), species (human), and language (English). Every combination of the unquoted phrase *breast implant* and *breast augmentation* was paired with each of 20 specific search terms previously mentioned. Every result that appeared to be potentially relevant to cosmetic breast augmentation, including those previously screened on the basis of abstract, was obtained as full-text and reviewed for outcomes of breast augmentation to ensure no relevant articles were erroneously screened in the first step.

Eighteen potentially relevant articles were identified from a pool of 3884 results on the basis of title, authorship, and abstract. Full-text versions were obtained and 7 articles were screened for failure to meet inclusion criteria. The second pass using PubMed identified an additional article from Japan with an abstract that did not indicate that it was an outcomes study (Fig. 1).<sup>10</sup>

### Assessment of Study Quality

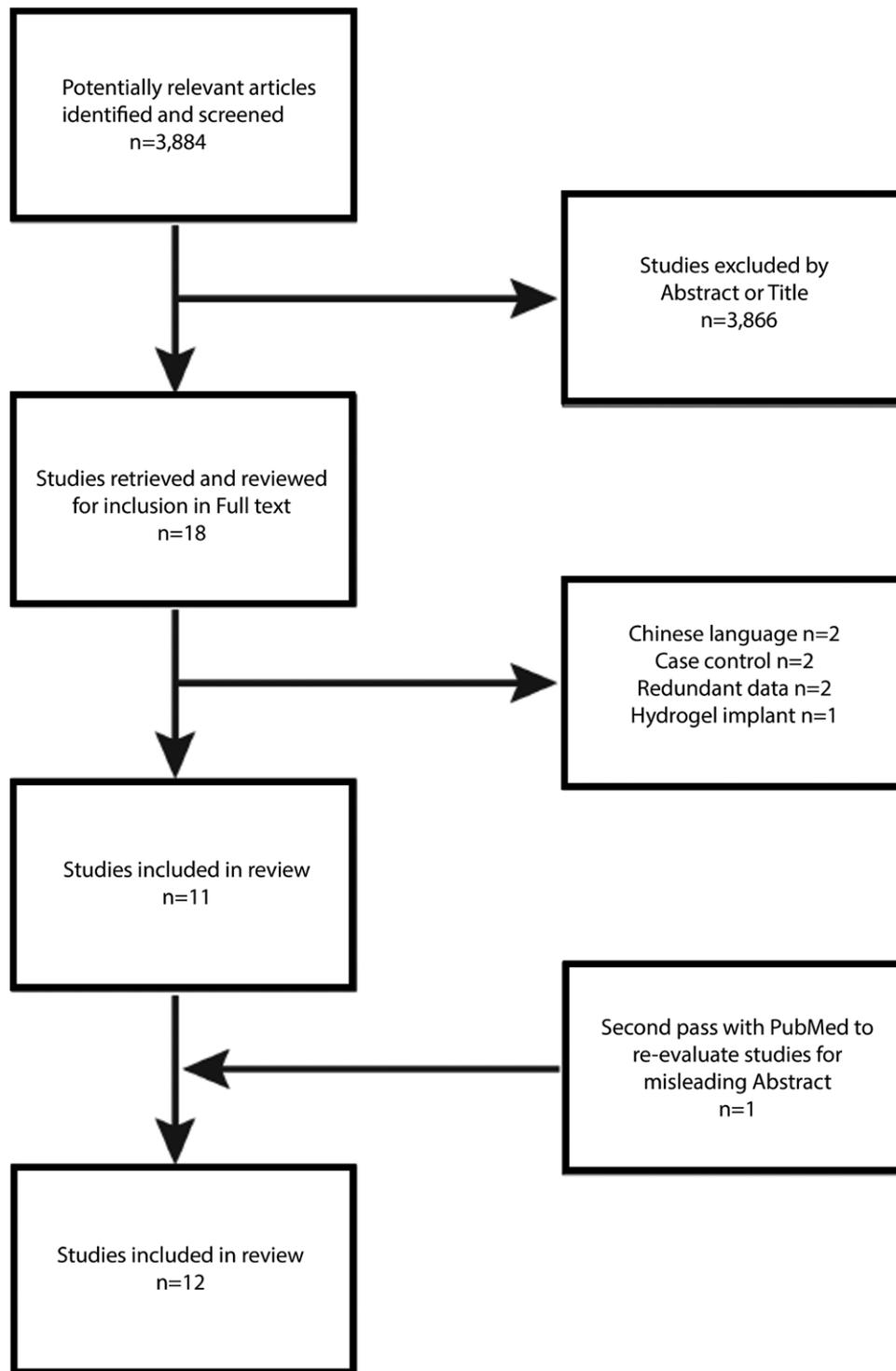
The quality of the 12 articles<sup>10,12,14-23</sup> that met criteria for inclusion in this review was assessed on the basis of number of patients studied, follow-up time, study purpose and design, identifiable biases, command of the English language, and thoroughness. The 2014 journal impact factor (Web of Knowledge *Journal Citation Report*) was evaluated.

### Data Interpretation

Outcomes parameters were nipple or implant malposition (including the "double-bubble" deformity), unacceptable scar, scar revision, capsular contracture, bleeding, collections, and nipple dysesthesia. Missing or unclear data were documented as such. When different interventions or techniques were compared within a study, statistical and clinical significance of data rendered was evaluated. Outcomes were qualitatively compared with several large, contemporary series and reviews originating in the United States<sup>24-26</sup> and China.<sup>7</sup>

### Statistical Analysis

Study characteristics, surgical methods, implant characteristics, and outcomes were summarized with



**Fig. 1.** Flowchart summarizing literature search.

descriptive statistics. A meta-analysis could not be performed because there was significant heterogeneity of study size and design, and we had difficulty in deciding if unreported adverse outcomes implied a zero event rate. Statistical analyses were performed using Microsoft Excel 2011 (Microsoft, Redmond, Calif.).

## RESULTS

### Overview of Studies

The focus of cosmetic breast literature from the Far East was injectable silicone, polyacrylamide, autologous fat transfer, and complications these methods

**Table 1. Summary of Relevant Studies**

Author	IF	Origin	n	Type	Purpose	Implant	Approach	Plane	ABX	Drain	Follow-up <sup>d</sup> (months)
Lai et al <sup>18</sup>	1.19	TAI	57	P	Innovation	Sm Sa	PN	SP	Preop	Yes	6–12
Lee et al <sup>19</sup>	1.46	KOR	306	P	Descriptive	Sa	PN	SP	Implant	+/-	>6
Takayanagi et al <sup>10</sup>	1.2	JAP	22	P	Guidance	Tex Si	IMF	SG	—	—	24
Luan et al <sup>23</sup>	1.47	CHN	49	P	Descriptive	Tex Ana Si	Axillary	Dual	—	Yes	6–12
Lee et al <sup>20</sup>	1.19	KOR	62	P	Descriptive	Sm Rnd Si	Omega	SP-SF	—	No	19
Ji et al <sup>16</sup>	3.53	CHN	13	P	Guidance	Ana Si	Axillary	Dual	—	Yes	12
Lee et al <sup>22</sup>	1.19	KOR	42	P	Descriptive	Sm Rnd Si	TUBA	SP	—	Yes	9
Lee et al <sup>21</sup>	1.19	KOR	89	P	Descriptive	Tex Rnd Si	Axillary	Dual (II/III)	Preop Implant	+/-	11
Sim <sup>12</sup>	NA	KOR	188	P	Descriptive	Tex Rnd Si	Axillary	Dual	—	No	11
Kim et al <sup>17</sup>	NA	KOR	44	P	Guidance	Tex Ana Si <sup>e</sup>	Axillary	Dual	—	No	11
Kim et al <sup>17</sup>	NA	KOR	36	P	Guidance	Tex Ana Si	IMF	Dual	Implant	—	10
Han et al <sup>15</sup>	3.3	KOR	10	P	Innovation	Sa and Sm Rnd Si <sup>e</sup>	Omega or PN	SP and SF	—	—	31
Cai and Zhou <sup>14</sup>	1	CHN	62	P	Guidance	Rnd Si	Axillary	Dual (I/II)	—	—	1–60
			498			Ana Si	PA		—	—	

— = not mentioned; II/III = Baker class.

<sup>a</sup>Shown, not described.

<sup>b</sup>“Third-party”-reported “bad” or “poor” result (84% response rate).

<sup>c</sup>A previous series was referenced but not cited or found.

<sup>d</sup>If given.

<sup>e</sup>Case numbers relevant to this.

ABX = antibiotics; Ana = anatomic; CHN = China; IF = 2014 journal impact factor; IMF = inframammary fold; JAP = Japan; KOR = Korea; NA = not applicable or none exists; numb = permanent nipple sensory loss; Omega = omega perinipple; P = prospective; PA = periareolar; PN = perinipple; Rnd = round; Sa = saline; SF = subfascial; SG = subglandular; Si = silicone; Sm = smooth; SP = subpectoral; TAI = Taiwan; Tex = textured; TUBA = transumbilical.

incurred.<sup>5</sup> There was an emphasis on reconstructive breast surgery. There were more basic scientific articles than outcomes studies. Case reports outnumbered series. Among these articles, 12 publications and a total of 2089 patients were evaluated. Ten of 12 articles referenced were in journals with impact factors that ranged from 1.02–3.53 (average, 1.67). Two series were published in *Archives of Plastic Surgery*,<sup>12,17</sup> which does not yet have an impact factor because it is new. Patients were followed from 1 month to 10 years, although follow-up was not clearly specified in every series.<sup>14,18,19,23</sup>

### Observational Studies

All studies qualified as prospective observational studies. Summarized data from these studies are shown in Table 1. Korea (7 series, 1380 cases) was the most represented nation,<sup>12,15,17,19–22</sup> followed by China (3 series, 622 cases),<sup>14,16,23</sup> Taiwan (1 series, 57 cases),<sup>18</sup> and Japan (1 series, 30 cases).<sup>10</sup> All studies were prospective and observational, and 3 offered comparative data.<sup>10,12,15</sup>

### Surgical Methods and Implants

Overall, 4178 implants were used. Of all implants placed, 17.9% were saline and 82.1% were silicone.

Saline implants were used exclusively in the earliest 2 studies that predated the FDA reapproval of silicone implants<sup>18,19</sup>; silicone implants were used in subsequent series, and almost exclusively. Round implants were used in 68.9% of patients in 11 studies that identified implant shape, and anatomic implants were used in 31.1%. Non-IMF approaches were used in 2023 patients (10 series, 96.9% of all patients). An areolar approach was used in 1536 patients (5 series, 73.5%),<sup>14,15,18,19,21</sup> the transaxillary approach was used in 445 patients (5 series, 21.3%),<sup>12,14,16,21,23</sup> and the transumbilical approach was used in 42 patients (1 series, 2.0%).<sup>22</sup> The IMF approach was used only in 2 studies (3.1% of all patients).<sup>10,17</sup> Implants were placed in subpectoral, subfascial, or dual plane positions in 2067 patients (98.9%). Implants were placed in the subglandular plane in 22 patients (1.1% overall).<sup>10</sup> Antibiotics were mentioned in 4 studies that accounted for 23.3% of patients. In 1 study, antibiotics were given preoperatively<sup>18</sup>; in 2 studies, antibiotics were applied topically to the implant before implantation<sup>17,19</sup>; and in 1 study, both preoperative and implant-laden antibiotics were used.<sup>21</sup> Eight of 12 studies (representing 40.7% of patients)

Malposition	Double Bubble	Bad Scar	Scar Revision	Capsular Contracture	Hematoma	Seroma	Infection	Numb	Comments
—	—	—	3 (5.2%)	0	—	—	0	0	nipple flattening
16 (5.2%)	4 (1.3%)	22 (7.2%)	17 (5.6%)	7 (2.3%)	4 (1.3%)	—	3 (1%)	0	PN for larger areolar diameters
4 (18%)	—	—	—	10% <sup>c</sup>	—	—	—	—	SG preferred
1 (12.5%)	—	—	—	—	—	—	—	—	—
0	0	—	4 (8.2%)	0	0	—	0	—	Average hospital stay 7 days
0	—	—	0	1 (II) (1.6%)	0	0	0	0	BMI 16.9; tattoo for pigmentary change
0	—	—	—	0	0	—	0	—	Shape stable after 6 months
0	0	4 (9.5%)	1 (2.3%)	1(II) 2(III) (3.5%)	0	0	0	—	Periumbilical bulge—transient
0	—	5 (6%)	—	1(II) 1(III) (2.2%)	3 (3.4%)	—	0	—	Focus on scarring
0	0	—	—	6 (III) (2.2%)	1 (0.4%)	1 (0.4%)	0	—	No reference to scar quality
7 (9.7%)	1 (2.8%) <sup>a</sup>	—	—	0	0	2 (0.9%)	0	—	IMF amenable to nipple malposition
0	—	47 (7.6%) <sup>b</sup>	—	9 (II) 7(III) (2.6%)	5 (0.8%)	—	—	0	Nipple distortion in 34%
0	—	—	—	4 (0.7%)	0	0	0	—	78% follow-up

mentioned drains. In 4 of the 8 studies (18.9% of patients), a drain was used.<sup>16,18,22,23</sup> In 2 studies (34.5% of patients), a drain was not used,<sup>12,20</sup> and drains were optional in 2 studies (46.5% of patients).<sup>19,21</sup>

**Outcomes**

Complications identified in the Asian breast augmentation literature are summarized in Table 2. Implant or nipple malposition was reported in 11 of

12 studies at a rate of 0–12.5% (average, 1.3%). In 2 studies where the IMF approach was used, malposition occurred in 18.1% of patients.<sup>10,17</sup> The “double-bubble” deformity (inferior implant displacement) was referenced in 4 studies<sup>12,19,22,23</sup> and was pictured (but not referenced by name) in 1 study,<sup>17</sup> occurring in 0–2.8% of women (average, 0.8%). Scarring was discussed in nearly every study, but poorly qualified, and undesirable scarring rates were reported in only

**Table 2. Complications Referenced**

Complication	Asian Experience			Reference Data	
	Referenced in ___ of 12 Studies	n	Incidence Range (mean)	Somogyi and Brown <sup>26</sup> n = 1536	Namnoum et al <sup>25</sup> n = 4412
Malposition	11	2032	0–12.5% (1.3%)	1.5%	1.8%
Capsular contracture, any degree	11	2059	0–3.5% (1.9%)	4.5%	3.6%
Hematoma	10	2002	0–3.4% (0.6%)	0.6%	—
Infection	10	1446	0–1.0% (0.2%)	—	0.3%
Seroma	6	932	0–1.3% (0.3%)	0.3%	—
Double-bubble	5	665	0–2.8% (0.8%)	—	—
Scar revision performed	5	516	0–8.2% (4.8%)	—	—
Imperfect scar	4	966	6–9.5% (7.3%)	—	—
Permanent nipple sensory loss	4	1013	0	—	—

7 of 12 studies. In these studies, 6–9.5% of patients had an imperfect scar (average, 7.3%); scars were revised in 0–8.2% of patients in relevant studies (average, 4.8%). Postoperative scar appearance was not explicitly described in either study where an IMF approach was used.<sup>10,17</sup> Capsular contracture was described in 11 of 12 studies, and sometimes further qualified by Baker class. In these studies, 0–3.5% had some degree of contracture (average, 1.9% of patients). Hematoma was mentioned in the results of 10 studies, occurring in 0–3.4% of those patients (average, 0.6%). Seroma was described in 6 studies to affect 0–0.9% of patients (average, 0.3% of patients). Infection was the rarest complication of all, affecting 3 patients in a single study (1% of that population),<sup>19</sup> and 0.2% of patients overall. Nipple sensation was evaluated in 4 of 5 studies where a nipple approach was used.<sup>15,18–20</sup> Transient hypoesthesia from 14%<sup>18</sup> to “most” of patients,<sup>19</sup> but all patients reported return of sensation by 2 years.

**Intrastudy Comparisons**

Comparative data offered by the studies are summarized in Table 3. Han et al<sup>15</sup> followed a large number of patients and compared subjective visual assessment scores when a traditional perinipple incision was used and when a novel “omega” design was used. The authors demonstrated comparatively superior results when the omega approach was used. The finding was statistically significant and clinically relevant. Takayanagi et al<sup>10</sup> compared rates of implant malposition when placed in the subglandular (18%) or subpectoral plane (12.5%). The purpose of that study was to guide implant placement on the basis of skin qualities. The authors reserved subpectoral positioning for women with scarce breast tissue and soft skin, and recommended superior placement of the implant in patients with elastic skin to account for caudal settling. Statistical significance of those data was not evaluated and the clinical significance of those data was unclear. Sim<sup>12</sup> demonstrated the feasibility of the transaxillary endoscope-assisted approach using round and anatomic implants in his observational study. Incidentally, complications were categorized by implant shape: capsular contracture and hematoma occurred more in patients when round implants were used (3.1% and 0.5%, respectively, versus 0%); seroma occurred more often when anatomic implants were used (4.5% versus 0.5%). Neither the statistical nor clinical significance of those data was evaluated.

**DISCUSSION**

Increased regulatory oversight, including the phasing out of injectable biomaterials, has resulted

**Table 3. Comparative Data**

Author	Purpose of Study	Comparison	Relevance to Study	Average Follow-up	Cases	Intervention	Outcome	Statistical Significance
Takayanagi et al <sup>10</sup>	Guidelines for implant placement	Subglandular versus subpectoral position	Unclear	24 months	22 8	SG plane SP plane	4 of 22 (18%) implant malposition 1 of 8 (12.5%) implant malposition <i>Capsular contracture</i> <i>Hematoma</i> <i>Seroma</i>	No No
Sim <sup>12</sup>	Descriptive of axillary approach	Round versus anatomic shape	Incidental finding	11 months	188 44	rnd implant ana implant	6 (III) (3.1%) 1 (0.5%) 0 2 (4.5%)	No Yes ( <i>P</i> = 0.015)
Han et al <sup>15</sup>	Improve scar appearance	“omega” versus classic perinipple incision	Purpose of study	31 months	10 603	omega incision classic incision	Scar appearance 3.9/5 third-party scar score 3.5/5 third-party scar score	Yes ( <i>P</i> = 0.015)

Rnd = round; Ana = anatomic; SP = subpectoral; SG = subglandular; III = Baker class

in rapid growth of Asian breast implant surgery in recent years. Since 2000, only 12 studies have longitudinally evaluated outcomes of breast augmentation in Asian women. Surgeons and their patients are pressed to rely on an expansive literature that reflects the longstanding and vast Western experience. For example, Kim et al<sup>17</sup> cites Mexican authors<sup>27</sup> stating that the IMF is the most widely used approach for breast augmentation. This is not so in Asia.<sup>5</sup> Also, more than 80% of naive patients followed by Sun et al<sup>7</sup> initially preferred an axillary incision for fear of a visible scar; after evidence-based education, that figure dropped to 54%. It is reassuring that patient education had such an impact, but 14 of 14 studies cited in the educational material originated in the West.

Women who seek approaches other than the IMF may be making the right choice, but for the wrong reason. The IMF approach represents 3% of procedures in the Asian literature. According to 2 studies, that approach is undesirable because it may predispose to implant malposition. Yet neither series reports postoperative scar appearance when the IMF approach is used.<sup>10,17</sup> A scar revision rate of 5% is described when non-IMF approaches were taken; the promise of “invisible scarring” may be misleading. The IMF is globally favored for increased implant control, ease, and risk reduction. However, the significance of disrupting the IMF is not completely understood and scars are not a known source of patient concern.<sup>24,25,28,29</sup> There are insufficient data to determine whether the IMF approach is equally beneficial in Asian women. Small breasts imply a decreased nipple-IMF distance,<sup>17</sup> a risk factor for double-bubble deformity.<sup>30</sup> Furthermore, authors describe ill-defined IMFs and tight skin envelopes in their Asian patients that may portend caudal descent of the implant and double-bubble deformity.

Areolar approaches involve perinipple, transareolar, and periareolar incisions and their variants. These are popular in Asia and account for 74% of patients followed in this review. However, Asian areolar may be as much as 10–15 mm smaller than in Caucasian women.<sup>8,9</sup> Traditional periareolar approaches may not enable adequate visualization and implantation of large silicone implants without inflicting collateral injury to surrounding tissue.<sup>15,18</sup> Cosmetically, an incision at the areolar border may lead to pincushioning, contracture, and abnormal pigmentation. Geometric zigzagged perinipple alternatives address restrictions imposed by small areolar, but skin sloughing and the need for revision surgery in 7.2% and 5.6% of women, respectively, might raise concern.<sup>19</sup>

Assuming these studies accurately reflect the Asian experience, silicone implants are used almost exclusively. Anatomic implants were used in nearly one-third of the patients, presumably for enhancement of upper pole fullness.<sup>16</sup> There are not enough data in the Asian literature to determine whether complication rates are influenced by implant shape. Only one study<sup>12</sup> suggested a disparity of outcomes but no conclusions were made. Implants were routinely placed in the submuscular, subfascial, or a dual plane. Rationale for submuscular or subfascial positioning is founded by a growing literature that suggests lower rates of capsular contracture,<sup>24</sup> reduced visibility and palpability. However, incidence of capsular contracture is not well described in Asians, and, if anything, appears lower than rates cited in contemporary Western series.<sup>24–26</sup> This may be explained by short follow-up; capsular contracture rates described resemble contemporary series' 1-year data.<sup>26</sup> Takayanagi et al<sup>10</sup> favor the subglandular plane in Japanese women and deny implant palpability and visibility when it is chosen. Risks and benefits of implant placement in the subglandular plane warrant reexploration.

Antibiotic administration, drain placement, and postoperative care were not routinely discussed, despite evidence that these may influence rates of infection and capsular contracture.<sup>31,32</sup> Four studies mentioned antibiotics; half of the studies reported regular use or avoidance of drains. These considerations are particularly relevant given the evidence that non-IMF approaches are associated with increased rates of capsular contracture.<sup>33</sup> Hematoma and seroma rates, when reported, were low and consistent with large contemporary series.<sup>24–26</sup> Infection does not seem to be a problem, nor does sensory loss when transareolar approaches are used. Undesirable scarring was the least reported, yet most common complication.<sup>12,15,17,19,21–23</sup> The scar carries significant weight in decision-making, as there is an important cultural preoccupation with visible scars.<sup>7</sup> In one study that evaluated scar appearance using a perinipple approach,<sup>15</sup> the Likert-type scoring system used was not a validated instrument. The concept of employing a third party to reduce bias was commendable, but a friend or family member may not be impartial. Given its importance to Asian women, scar appearance should be followed in forthcoming series. Moreover, standardized instruments that enable comparisons of various strategies across series and centers would be of benefit.

Cognizant of cultural nuances, anatomic differences, and a growing demand for breast augmentation in Asia, it behooves the Asian surgical community to fortify the literature with ethnicity-

specific outcomes data after breast augmentation. Of course, this carries the assumption that not all Asians are alike. Koreans represented the majority of patients in the pertinent literature despite being vastly outnumbered by the Chinese. Important distinctions among Asian nationalities also exist; perhaps, future studies will further delineate treatment algorithms catered to the Japanese, Koreans, and Filipinos, for example. Filtering the non-English literature imposed potential bias; this review may underestimate the current literature. The major weakness of this article is the impetus behind it. That is, the quality and quantity of data that exist in the literature regarding Asian breast augmentation are low. Long-term data are lacking; 5 of 8 studies that define average follow-up were 12 months or less, making it difficult to identify long-term patterns. Variations in study design and outcomes parameters further challenge the quality and relevance of data. Pooled meta-analyses are impossible given said heterogeneity.

Deficiencies in the Asian literature reflect a nascent but growing collective experience with implant-based breast augmentation. We imagine that high-quality series data are being gathered at the time of writing; the authors are collecting data as part of an ongoing, multicenter, international series. We encourage Asian investigators to do the same by establishing standardized databases to allow for cross-study comparisons and multicenter meta-analyses. Somogyi and Brown<sup>26</sup> offer an excellent example of a database template. In addition, scar appearance, patient satisfaction, and symmetry or nipple distortion should be studied to improve decision-making in clinical practice (See **appendix**, which displays the database template for the Asian breast augmentation series, <http://links.lww.com/PRSGO/A142>). We expect that ethnicity-specific evidence-based guidelines will not always coincide with Western data. There is a need for refinements in current methods that address unique needs of Asian women undergoing augmentation mammoplasty.

## CONCLUSIONS

The quantity and quality of data relevant to Asian augmentation mammoplasty are inadequate. Asian women and their surgeons presumably rely on the Western experience for guidance, which may not be relevant. Because important cultural and anatomic distinctions exist, these inadequacies may result in suboptimal outcomes and misguided decisions. Ongoing data collection is warranted. Innovative, tailored refinements of current techniques will benefit Asian women who elect to have their breasts augmented.

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