

Original Article

## Indian Surgeons' Perspective Regarding Breast-Conserving Surgery: A Cohort Study

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### ABSTRACT

**Objective:** Breast-conserving surgery (BCS) has constantly evolved and recently involves many new facets in the form of SLNB, breast oncoplastic surgery, and brachytherapy. Breast surgeons are required to constantly unlearn and learn to keep abreast with the new guidelines. We aimed to study the Indian surgeons' perspective about BCS.

**Participants:** We mailed a questionnaire containing 20 questions regarding various aspects of BCS to 1200 surgeons. Of these, 112 surgeons (40 endocrine surgeons, 40 surgical oncologists, and 32 general surgeons) responded.

**Results:** We found that surgeons in the 31 to 40-year age group, surgeons with superspecialty training, surgeons working in private setup, and high-volume surgeons (>100 cases/year) were performing more BCS.

**Conclusion:** Indian surgeons should have more robust training in BCS to increase the rates of BCS in India.

**Keywords:** Breast-conserving surgery, MRM, Surgeon

### INTRODUCTION

Breast-conserving surgery (BCS) is a legacy of Umberto Veronesi who laid the groundwork for preservation of the body image of women affected by breast cancer with the Milan I study in the late 1970s. Treatment of breast cancer has evolved with the advancement in the screening technique, development of alternative surgical approach and radiation technologies, and coordination of multidisciplinary team to implement multifaceted treatment.

BCS has the advantage of less invasive surgery, shorter recovery time, and better psychological outcomes (satisfaction with body image and social acceptance) than MRM. In a randomized controlled trial, BCS + radiation therapy (RT) has been shown to be at least equivalent or even superior to mastectomy.<sup>[1,2]</sup> When BCS + RT was compared to mastectomy alone, 3-, 5-, and 10-year survival was 96.5% vs. 93.4%, 92.9% vs. 88.35% and 80.9% vs. 67.2% respectively.<sup>[3]</sup> Despite of all these facts and results, both Indian surgeons and patients have been slow to adopt this treatment method, and mastectomy rates are still higher for a variety of reasons.

Breast surgery is a territory that is catered by general surgeons and multiple other subspecialists (oncosurgeons, breast surgeons) in India. It is seen that general surgeons usually prefer mastectomy for early breast cancer (EBC), whereas BCS is preferred and mostly performed by trained breast surgeons. These variations are observed depending on the training and intent to treat. The main reason leading to low rates of BCS is the lack of surgical skills required for

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BCS and breast reconstruction. Some surgeons still have the impression that mastectomy is clinically superior to BCS because of low risk of recurrence. Only 10% of patients with EBC in India undergo BCS<sup>[4]</sup> compared to 70% in the USA.<sup>[5]</sup> Thus, it is imperative that surgeons know the practice of other surgeons in their own country and also abroad. The available technologies make the surgery safer for the surgeon and patient, so the learning and unlearning exercise is necessary in the field of surgery. We aimed to study the Indian surgeon's perspective on BCS.

## MATERIALS AND METHODS

We developed a questionnaire with 20 questions regarding various aspects of BCS. The link to the questionnaire (Questionnaire No. 1) was sent by emails to general surgeons, oncosurgeons, endocrine and breast surgeons, and breast specialists throughout India. They filled in the questionnaire by logging into a dedicated website, [www.spggibreast.in](http://www.spggibreast.in). The emails were sent to members of the associations of breast surgeons, endocrine surgeons, and surgeons in India.

Social media in the form of Facebook and WhatsApp was also used to send this request to different surgeon groups. The filled in questionnaire was available and sent through mail to the corresponding author. The question was entered in an Excel sheet and then converted into a Statistical Package for Social Sciences (SPSS) sheet and analyzed. The consent was given in the website, and once consent is provided by the surgeons, the questionnaire is then filled in. The response of the surgeons was kept confidential. This study was approved by the ethics committee of the institution.

## STATISTICAL ANALYSIS

In the descriptive statistics, continuous variables were presented as mean  $\pm$ SD, while categorical variables were presented as frequency (%). To test the association between various questions asked from the surgeons and age, educational standard, fellowship status, clinical experience in years, clinical setup, number of patients per year, and sex, Pearson's chi-square test or Fisher's exact test was used as appropriate. A *P*-value  $<0.05$  was considered statistically significant. SPSS version 23 (IBM, Chicago, USA) was used in the statistical data analysis.

## RESULTS

A total of 1200 emails were sent to surgeons practicing breast surgery in India. A total of 112 (9.3%) surgeons responded to the request, of which 40 were breast and endocrine surgeons or breast specialists, 40 were oncosurgeons performing breast surgery, and 32 were general surgeons performing breast surgery.

When the age of the surgeon was taken into consideration in analyzing the responses, we found that surgeons in the 20–30-year age group performed MRM more than BCS ( $P = 0.017$ ), believed that BCS is not equivalent to MRM in terms of disease outcome ( $P = 0.012$ ), did not mark the cavity with metallic clip (0.009), and were keen on attending the training for BCS [Table 1]. When comparing a surgeon with superspecialty degree and a surgeon with specialty degree, we found that majority of superspecialists performed BCS ( $P < 0.01$ ), provided long-term disease control ( $P < 0.01$ ), routinely marked the cavity ( $P < 0.001$ ), and provided self-administered systemic therapy ( $P = 0.006$ ), while special surgeons liked to attend BCS training ( $P = 0.014$ ) [Table 2]. When comparing surgeons with and without dedicated breast fellowship, surgeons with fellowship (93.8%) performed oncoplastic procedures ( $P < 0.001$ ) and marked the cavity with clip ( $P = 0.001$ ), while surgeons without fellowship liked to attend BCS training ( $P = 0.003$ ) [Table 3]. When surgeons were compared according to their clinical experience (0–5, 5–10 and  $>10$  years), we found that surgeons with  $<5$  years' experience and  $>10$  years' experience performed BCS less ( $P < 0.001$ ) and liked to attend BCS training ( $P = 0.002$ ) [Table 4].

When surgeons were analyzed according to the clinical setup, which is governmental, private, or both, we found that private surgeons routinely sent the margins for frozen section biopsy (0.010), and surgeons working in governmental setup were keen on attending BCS training ( $P = 0.001$ ) [Table 5]. When surgeons were analyzed based on number of cases operated per year (0–20, 20–10, and  $>100$ ), surgeons with more than  $>100$  cases routinely performed BCS ( $P < 0.001$ ), practiced SLNB, used both blue dye and radiopharmaceutical agent, routinely performed oncoplastic procedures ( $P < 0.001$ ), and routinely marked the cavity [Table 6]. When male and female surgeons were compared, there was no significant difference [Table 7].

## DISCUSSION

The response by email and use of social media lead to only 9.3% of surgeons filling the questionnaire. Some studies have a 38%<sup>[6]</sup> response rate, whereas others have up to 80%<sup>[7]</sup> in a developing country where there are several responsibilities for young surgeons, including counseling, surgical work, and postoperative care. Even because of several chemotherapy administrations and numerous mails<sup>[8]</sup> requesting such research and association activities, this kind of poor response is observed. We did not send multiple reminders to avoid disturbance to academic surgeons who have to multitask different aspects of life.

Young (20–30 years) and old surgeons ( $>50$  years) performed more MRM. This is probably due to lack of training in the case of old surgeons where they were exposed to radical

**Table 1:** Distribution of knowledge and practices as per age group.

Questions	Response	Age Group				Total (n = 112)	P-value
		20-30 (n = 36)	31-40 (n = 45)	41-50 (n = 17)	>50 (n = 14)		
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	21 (58.3)	34 (75.6)	16 (94.1)	13 (92.9)	84 (75.0)	0.012
Do you routinely perform BCS for early breast cancer?	Yes	9 (25.0)	25 (55.6)	9 (52.9)	9 (64.3)	52 (46.4)	0.017
Do you take into consideration the patient's economic condition?	Yes	28 (77.8)	37 (82.2)	15 (88.2)	12 (85.7)	92 (82.1)	0.843
Do you think BCS provides adequate long-term disease control?	Yes	22 (61.1)	35 (77.8)	14 (82.4)	12 (85.7)	83 (74.1)	0.210
Do you routinely excise the skin during BCS?	Yes	11 (34.4)	20 (45.5)	4 (23.5)	5 (35.7)	40 (37.4)	0.430
Do you routinely send the margins for frozen section biopsy?	Yes	12 (33.3)	20 (44.4)	5 (29.4)	5 (35.7)	42 (37.5)	0.640
If not, specify the reason	Unavailability	20 (83.3)	12 (46.2)	8 (66.7)	6 (66.7)	46 (64.8)	0.054
	Wide margins	4 (16.7)	14 (53.8)	4 (33.3)	3 (33.3)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	14 (38.9)	21 (46.7)	10 (58.8)	7 (50.0)	52 (46.4)	0.584
If yes, what do you use?	Blue dye	7 (53.8)	10 (47.6)	8 (80.0)	1 (14.3)	26 (53.2)	0.067
	Both	6 (46.2)	11 (52.4)	2 (20.0)	6 (85.7)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	33 (91.7)	44 (97.8)	15 (88.2)	13 (92.9)	105 (93.8)	0.285
Do you routinely perform oncoplastic procedures?	Yes	10 (27.8)	30 (66.7)	8 (47.1)	10 (71.4)	58 (51.8)	0.002
Do you think BCS results in lower levels of psychological morbidity?	Yes	30 (83.3)	40 (88.9)	16 (94.1)	12 (85.7)	98 (87.5)	0.745
Do you routinely mark the cavity with the metallic clip?	Yes	10 (27.8)	28 (62.2)	5 (29.4)	7 (50.0)	50 (44.6)	0.009
Do you perform self-administered systemic therapy?	Yes	6 (16.7)	18 (40.0)	6 (35.3)	5 (35.7)	35 (31.2)	0.123
Would you like to attend training for BCS?	Yes	31 (86.1)	37 (82.2)	9 (52.9)	8 (57.1)	85 (75.9)	0.015
#If yes, for what time period?	1 week	27 (87.1)	32 (86.5)	9 (100.0)	7 (87.5)	75 (88.2)	0.297
	1 month	4 (12.9)	5 (13.5)	0 (0)	0 (0)	9 (10.6)	
	1 year	0 (0)	0 (0)	0 (0)	1 (12.5)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	4 (11.1)	5 (11.1)	8 (47.1)	4 (28.6)	21 (18.8)	0.007
In your view, what is the most common hindrance in BCS?	Fear of recurrence	15 (41.7)	21 (46.7)	9 (52.9)	5 (35.7)	45 (44.6)	0.640
	Lack of Awareness	7 (19.4)	9 (20.0)	2 (11.8)	2 (14.3)	20 (17.9)	
	Lack of medical expertise and infrastructure	14 (38.9)	14 (31.1)	5 (29.4)	5 (35.7)	38 (33.9)	
	Others	0 (0)	1 (2.2)	1 (5.9)	2 (14.3)	4 (3.6)	

Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

**Table 2:** Distribution of knowledge and practices as per educational standard.

Questions	Response	Education standard			P-value
		Superspecialty (n = 40)	Specialty (n = 72)	Total (n = 112)	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	35 (87.5)	49 (68.1)	84 (75.0)	0.023
Do you routinely perform BCS for early breast cancer?	Yes	30 (75.0)	22 (30.6)	52 (46.4)	<0.001
Do you take into consideration the patient's economic condition?	Yes	34 (85.0)	58 (80.6)	92 (82.1)	0.556
Do you think BCS provides adequate long-term disease control?	Yes	38 (95.0)	45 (62.5)	83 (74.1)	<0.001
Do you routinely excise the skin during BCS?	Yes	12 (30.8)	28 (41.2)	40 (37.4)	0.284
Do you routinely send the margins for frozen section biopsy?	Yes	20 (50.0)	22 (30.6)	42 (37.5)	0.042
If not, specify the reason	Yes	8 (40.0)	38 (74.5)	46 (64.8)	0.006
Do you perform SLNB in your practice?	Yes	24 (60.0)	28 (38.9)	52 (46.4)	0.032
If yes, what do you use?	Blue dye	10 (41.7)	16 (59.3)	26 (51.0)	0.210
	Both	14 (58.3)	11 (40.7)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	39 (97.5)	66 (91.7)	105 (93.8)	0.418
Do you routinely perform oncoplastic procedures?	Yes	33 (82.5)	25 (34.7)	58 (51.8)	<0.001
Do you think BCS results in lower levels of psychological morbidity?	Yes	38 (95.0)	60 (83.3)	98 (87.5)	0.074
Do you routinely mark the cavity with the metallic clip?	Yes	27 (67.5)	23 (31.9)	50 (44.6)	<0.001
Do you perform self-administered systemic therapy?	Yes	19 (47.5)	16 (22.2)	35 (31.2)	0.006
Would you like to attend training for BCS?	Yes	25 (62.5)	60 (83.3)	85 (75.9)	0.014
#If yes, for what time period?	1 week	21 (84.0)	54 (90.0)	75 (88.2)	0.605
	1 month	4 (16.0)	5 (8.3)	9 (10.6)	
	1 year	0 (0)	1 (1.7)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	11 (27.5)	10 (13.9)	21 (18.8)	0.077
In your view, what is the most common hindrance in BCS?	Fear of recurrence	21 (52.5)	29 (40.3)	50 (44.6)	0.469
	Lack of Awareness	8 (20.0)	12 (16.7)	20 (17.9)	
	Lack of medical expertise and infrastructure	10 (25.0)	28 (38.9)	38 (33.9)	
	Others	1 (2.5)	3 (4.2)	4 (3.6)	

Chi-square test or Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

**Table 3:** Distribution of knowledge and practices as per fellowship status.

Questions	Response	Fellowship			P-value
		Yes (n = 16)	No (n = 96)	Total (n = 112)	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	14 (87.5)	70 (72.9)	84 (75.0)	0.350
Do you routinely perform BCS for early breast cancer?	Yes	13 (81.2)	39 (40.6)	52 (46.4)	0.003
Do you take into consideration the patient's economic condition?	Yes	14 (87.5)	78 (81.2)	92 (82.1)	0.733
Do you think BCS provides adequate long-term disease control?	Yes	14 (87.5)	69 (71.9)	83 (74.1)	0.232
Do you routinely excise the skin during BCS?	Yes	6 (37.5)	34 (37.4)	40 (37.4)	0.992
Do you routinely send the margins for frozen section biopsy?	Yes	8 (50.0)	34 (35.4)	42 (37.5)	0.265
If no, specify the reason	Unavailability	2 (28.6)	44 (68.3)	46 (64.3)	0.088
	Wide margins	5 (71.4)	20 (31.2)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	11 (68.8)	41 (42.7)	52 (46.4)	0.053
If yes, what do you use?	Blue dye	2 (18.2)	24 (60.0)	26 (51.0)	0.014
	Both	9 (81.8)	16 (40.0)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	16 (100.0)	89 (92.7)	105 (93.8)	0.591
Do you routinely perform oncoplastic procedures?	Yes	15 (93.8)	43 (44.8)	58 (51.8)	<0.001
Do you think BCS results in lower levels of psychological morbidity?	Yes	15 (93.8)	83 (86.5)	98 (87.5)	0.688
Do you routinely mark the cavity with the metallic clip?	Yes	13 (81.2)	37 (38.5)	50 (44.6)	0.001
Do you perform self-administered systemic therapy	Yes	8 (50.0)	27 (28.1)	35 (31.2)	0.081
Would you like to attend training for BCS?	Yes	7 (43.8)	78 (81.2)	85 (75.9)	0.003
#If yes, for what time period?	1 week	6 (85.7)	69 (88.5)	75 (88.2)	0.598
	1 month	1 (14.3)	8 (10.3)	9 (10.6)	
	1 year	0 (0)	1 (1.3)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	5 (31.2)	16 (16.7)	21 (18.8)	0.177
In your view, what is the most common hindrance in BCS?	Fear of recurrence	9 (56.2)	41 (42.7)	50 (44.6)	0.008
	Lack of Awareness	1 (6.2)	19 (19.8)	20 (17.9)	
	Lack of medical expertise and infrastructure	3 (18.8)	35 (36.5)	38 (33.9)	
	Other	3 (18.8)	1 (1.0)	4 (3.6)	

Chi-square test or Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

**Table 4:** Distribution of knowledge and practices as per clinical experience.

Questions	Response	Clinical experience in years				P-value
		0-5 (n = 56)	5-10 (n = 18)	>10 (n = 38)	Total (n = 112)	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	37 (66.1)	15 (83.3)	32 (84.2)	84 (75.0)	0.117
Do you routinely perform BCS for early breast cancer?	Yes	15 (26.8)	16 (88.9)	21 (55.3)	52 (46.4)	<0.001
Do you take into consideration the patient's economic condition?	Yes	45 (80.4)	14 (77.8)	33 (86.8)	92 (82.1)	0.634
Do you think BCS provides adequate long-term disease control?	Yes	35 (62.5)	16 (88.9)	32 (84.2)	83 (74.1)	0.023
Do you routinely excise the skin during BCS?	Yes	19 (37.3)	8 (44.4)	13 (34.2)	40 (37.4)	0.761
Do you routinely send the margins for frozen section biopsy?	Yes	19 (33.9)	8 (44.4)	15 (39.5)	42 (37.5)	0.691
If no, specify the reason	Unavailability	28 (75.7)	5 (45.5)	13 (56.5)	46 (64.8)	0.111
	Wide margins	9 (24.3)	6 (54.5)	10 (43.5)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	21 (37.5)	10 (55.6)	21 (55.3)	52 (46.4)	0.166
If yes, what do you use?	Blue dye	12 (60.0)	5 (50.0)	9 (42.9)	26 (51.0)	0.580
	Both	8 (40.0)	5 (50.0)	12 (57.1)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	51 (91.1)	17 (94.4)	37 (97.4)	105 (93.8)	0.514
Do you routinely perform oncoplastic procedures?	Yes	19 (33.9)	14 (77.8)	25 (65.8)	58 (51.8)	0.001
Do you think BCS results in lower levels of psychological morbidity?	Yes	48 (85.7)	17 (94.4)	33 (86.8)	98 (87.5)	0.689
Do you routinely mark the cavity with the metallic clip?	Yes	21 (37.5)	12 (66.7)	17 (44.7)	50 (44.6)	0.096
Do you perform self-administered systemic therapy?	Yes	13 (23.2)	9 (50.0)	13 (34.2)	35 (31.2)	0.091
Would you like to attend training for BCS?	Yes	50 (89.3)	12 (66.7)	23 (60.5)	85 (75.9)	0.002
#If yes, for what time period?	1 week	43 (86.0)	10 (83.3)	22 (95.7)	75 (88.2)	0.100
	1 month	7 (14.0)	2 (16.7)	0 (0)	9 (10.6)	
	1 year	0 (0)	0 (0)	1 (4.3)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	4 (7.1)	5 (27.8)	12 (31.6)	21 (18.8)	0.005
In your view, what is the most common hindrance in BCS?	Fear of recurrence	24 (42.9)	10 (55.6)	16 (42.1)	50 (44.6)	0.376
	Lack of Awareness	11 (19.6)	3 (16.7)	6 (15.8)	20 (17.9)	
	Lack of medical expertise & infrastructure	21 (37.5)	4 (22.2)	13 (34.2)	38 (33.9)	
	Others	0 (0)	1 (5.6)	3 (7.9)	4 (3.6)	

Chi-square test or Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

**Table 5:** Distribution of knowledge and practices as per clinical setup.

Questions	Response	Clinicalsetup				P-value
		Government (n = 55)	Private (n = 39)	Both (n = 18)	Total (n = 112)	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	40 (72.7)	31 (79.5)	13 (72.2)	84 (75.0)	0.766
Do you routinely perform BCS for early breast cancer?	Yes	20 (36.4)	23 (59.0)	9 (50.0)	52 (46.4)	0.090
Do you take into consideration the patient's economic condition?	Yes	42 (76.4)	34 (87.2)	16 (88.9)	92 (82.1)	0.359
Do you think BCS provides adequate long-term disease control?	Yes	36 (65.5)	33 (84.6)	14 (77.8)	83 (74.1)	0.107
Do you routinely excise the skin during BCS?	Yes	15 (29.4)	18 (47.4)	7 (38.9)	40 (37.4)	0.221
Do you routinely send the margins for frozen section biopsy?	Yes	15 (27.3)	22 (56.4)	5 (27.8)	42 (37.5)	0.010
If no, specify the reason	Unavailability	29 (74.4)	9 (47.4)	8 (61.5)	46 (64.8)	0.132
	Wide margins	10 (25.6)	10 (52.6)	5 (38.5)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	25 (45.5)	20 (51.3)	7 (38.9)	52 (46.4)	0.670
If yes, what do you use?	Blue dye	11 (44.0)	11 (57.9)	4 (57.1)	26 (51.0)	0.683
	Both	14 (56.0)	8 (42.1)	3 (42.9)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	50 (90.9)	38 (97.4)	17 (94.4)	105 (93.8)	0.516
Do you routinely perform oncoplastic procedures?	Yes	26 (47.3)	24 (61.5)	8 (44.4)	58 (51.8)	0.313
Do you think BCS results in lower levels of psychological morbidity?	Yes	48 (87.3)	37 (94.9)	13 (72.2)	98 (87.5)	0.057
Do you routinely mark the cavity with the metallic clip?	Yes	25 (45.5)	20 (51.3)	5 (27.8)	50 (44.6)	0.249
Do you perform self-administered systemic therapy	Yes	18 (32.7)	10 (25.6)	7 (38.9)	35 (31.2)	0.572
Would you like to attend training for BCS?	Yes	48 (87.3)	23 (59.0)	14 (77.8)	85 (75.9)	0.007
#If yes, for what time period?	1 week	47 (97.9)	16 (69.6)	12 (85.7)	75 (88.2)	0.001
	1 month	1 (2.1)	7 (30.4)	1 (7.1)	9 (10.6)	
	1 year	0 (0)	0 (0)	1 (7.1)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	6 (10.9)	12 (30.8)	3 (16.7)	21 (18.8)	0.056
In your view, what is the most common hindrance in BCS?	Fear of recurrence	20 (36.4)	10 (51.3)	10 (55.6)	50 (44.6)	0.288
	Lack of awareness	10 (18.2)	6 (15.4)	4 (22.2)	20 (15.5)	
	Lack of medical expertise and infrastructure	24 (43.6)	11 (28.2)	3 (16.7)	38 (33.9)	
	Others	1 (1.8)	2 (5.1)	3 (5.6)	4 (3.6)	

Chi-square test or Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

**Table 6:** Distribution of knowledge and practices as per number of patients per year.

Questions	Response	Number of patients per year				P-value
		0-20 (n = 45)	20-100 (n = 36)	>100 (n = 31)	Total	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	28 (62.2)	30 (83.3)	26 (83.9)	84 (75.0)	0.038
Do you routinely perform BCS for early breast cancer?	Yes	7 (15.6)	22 (61.1)	23 (74.2)	52 (46.4)	<0.001
Do you take into consideration the patient's economic condition?	Yes	37 (82.2)	31 (86.1)	24 (77.4)	92 (82.1)	0.651
Do you think BCS provides adequate long-term disease control?	Yes	26 (57.8)	31 (86.1)	26 (83.9)	83 (74.1)	0.005
Do you routinely excise the skin during BCS?	Yes	19 (45.2)	14 (40.0)	7 (23.3)	40 (37.4)	0.154
Do you routinely send the margins for frozen section biopsy?	Yes	15 (33.3)	17 (47.2)	10 (32.3)	42 (37.5)	0.342
If no, specify the reason	Unavailability	26 (81.2)	13 (68.4)	7 (35.0)	46 (64.8)	0.003
	Wide margins	6 (18.8)	6 (31.6)	13 (65.0)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	11 (24.4)	18 (50.0)	23 (74.2)	52 (46.4)	<0.001
If yes, what do you use?	Blue Dye	10 (90.9)	10 (58.8)	6 (26.1)	26 (51.0)	0.001
	Both	1 (9.1)	7 (41.2)	17 (73.9)	25 (49.0)	
In your view, does BCS procedure provide an acceptable cosmetic appearance?	Yes	42 (93.3)	33 (91.7)	30 (96.8)	105 (93.5)	0.795
Do you routinely perform oncoplastic procedures?	Yes	13 (28.9)	21 (58.3)	24 (77.4)	58 (51.8)	<0.001
Do you think BCS results in lower levels of psychological morbidity?	Yes	41 (91.1)	31 (86.1)	26 (83.9)	98 (87.5)	0.590
Do you routinely mark the cavity with the metallic clip?	Yes	13 (28.9)	12 (33.3)	25 (80.6)	50 (44.6)	<0.001
Do you perform self-administered systemic therapy?	Yes	11 (24.4)	15 (41.7)	9 (29.0)	35 (31.2)	0.239
Would you like to attend training for BCS?	Yes	40 (88.9)	26 (72.2)	19 (61.3)	85 (75.9)	0.018
#If yes, for what time period?	1 week	35 (87.5)	21 (80.8)	19 (100)	75 (88.2)	0.179
	1 month	5 (12.5)	4 (15.4)	0 (42.9)	9 (10.6)	
	1 year	0 (0)	1 (3.8)	0 (0)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	3 (6.7)	10 (27.8)	8 (25.8)	21 (18.8)	0.027
In your view, what is the most common hindrance in BCS?	Fear of recurrence	19 (42.2)	14 (38.9)	17 (54.8)	50 (44.6)	0.398
	Lack of awareness	9 (20.0)	8 (22.2)	3 (9.7)	20 (17.9)	
	Lack of medical expertise and infrastructure	17 (37.8)	12 (33.3)	9 (29.0)	38 (33.9)	
	Others	0 (0)	2 (5.6)	2 (6.5)	4 (3.6)	

Chi-square test or Fisher exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.



**Table 7:** Distribution of knowledge and practices as per sex of the surgeon.

Questions	Response	Sex			P-value
		Male (n = 93)	Female (n = 19)	Total (n = 112)	
Do you think BCS is equivalent to mastectomy in terms of disease outcome?	Yes	69 (74.2)	15 (78.9)	84 (75.0)	0.778
Do you routinely perform BCS for early breast cancer?	Yes	40 (43.0)	12 (63.2)	52 (46.4)	0.109
Do you take into consideration the patient's economic condition?	Yes	74 (79.6)	18 (94.7)	92 (82.1)	0.188
Do you think BCS provides adequate long-term disease control?	Yes	66 (71.0)	17 (89.5)	83 (74.1)	0.149
Do you routinely excise the skin during BCS?	Yes	33 (37.1)	7 (38.9)	40 (37.4)	0.885
Do you routinely send the margins for frozen section biopsy?	Yes	35 (37.6)	7 (36.8)	42 (37.5)	0.948
If no, specify the reason	Unavailability	40 (69.0)	6 (46.2)	46 (64.8)	0.197
	Wide margins	18 (31.0)	7 (53.8)	25 (35.2)	
Do you perform SLNB in your practice?	Yes	43 (46.2)	9 (47.4)	52 (46.4)	0.928
If yes, what do you use?	Blue dye	23 (54.8)	3 (33.3)	26 (51.0)	0.291
	Both	19 (45.2)	6 (66.7)	25 (49.0)	
In your view, does BCS provide an acceptable cosmetic appearance?	Yes	88 (94.6)	17 (89.5)	105 (93.8)	0.339
Do you routinely perform oncoplastic procedures?	Yes	46 (49.5)	12 (63.2)	58 (51.8)	0.276
Do you think BCS results in lower levels of psychological morbidity?	Yes	81 (87.1)	17 (89.5)	98 (87.5)	0.998
Do you routinely mark the cavity with the metallic clip?	Yes	41 (44.1)	9 (47.4)	50 (44.6)	0.793
Do you perform self-administered systemic therapy?	Yes	27 (29.0)	8 (42.1)	35 (31.2)	0.285
Would you like to attend training for BCS?	Yes	74 (79.6)	11 (57.9)	85 (75.9)	0.073
#If yes, for what time period?	1 week	66 (89.2)	9 (81.8)	75 (88.2)	0.142
	1 month	8 (10.8)	1 (9.1)	9 (10.6)	
	1 year	0 (0)	1 (9.1)	1 (1.2)	
Do you use any means of telecommunication or mass media to help patients decide?	Yes	19 (20.4)	2 (10.5)	21 (18.8)	0.519
In your view, what is the most common hindrance in BCS?	Fear of recurrence	37 (39.8)	13 (68.4)	50 (44.6)	0.095
	Lack of awareness	18 (19.4)	2 (10.5)	20 (17.9)	
	Lack of medical expertise and infrastructure	35 (37.6)	3 (15.8)	38 (33.9)	
	Others	3 (3.2)	1 (5.3)	4 (3.6)	

Chi-square test or Fisher's exact test was used. Column percentages are within brackets.

#Missing information due to a specific question.

mastectomy and in the case of young surgeons the fear of recurrence and tarnishing of image in case of failure in initial cases, which can have disastrous results in their career. In a study by Monica Morrow, the concern about excessive use of MRM by surgeons was addressed, and they found that patient's preference, contraindication to BCS, or adjuvant therapy were the primary reasons.<sup>[9]</sup>

In our study, sex was not significant. However, in one study, female surgeons spent more time with the patients and were successful in convincing patients to undergo BCS.<sup>[10]</sup> The outlook for BCS by male/female surgeons did not change in this study. Superspecialty surgeons trained in elite institutions, since only very few superspecialty seats are available throughout India, were comfortable in performing BCS with SLNB. General surgeons with less exposure to BCS training have to be trained to save breasts.

Surgeons with >100 breast cases per year were comfortable in BCS, and this is expected as patients in this modern era approach surgeons with excellent results. One study found that patients treated in smaller hospitals by older surgeons frequently undergo MRM.<sup>[11]</sup> Compared with institutions of excellence and reputed institutions, governmental institutions have lesser high-technology equipment, including frozen section facility, compared to private setup. This kind of logistics issues can impede BCS in a developing country.

The intent to learn and unlearn in surgeons for the sake of improved quality of treatment and life for the patient is the most important factor in performing BCS in an eligible patient. The setup, qualification, technology, patient preference, sex of the surgeon, and clinical setup also play a role.

## CONCLUSION

We conclude that robust training of surgeons in the BCS of breast cancer saves breast as well as quality of life.

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## Conflicts of interest

The authors declare no conflict of interest.

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