



Trainees participation in breast cancer surgery: an assistance or a hinderance?

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Provenance: This is an invited article commissioned by the Editorial Office of *Gland Surgery*.

Comment on: Srour MK, Manguso N, Mirocha J, *et al.* Impact of Resident and Fellow Participation on Surgical Outcomes in Breast Conserving Surgery for Invasive Breast Cancer. *J Surg Educ* 2019. [Epub ahead of print].

Submitted Nov 19, 2019. Accepted for publication Nov 28, 2019.

doi: 10.21037/gs.2019.12.02

View this article at: <http://dx.doi.org/10.21037/gs.2019.12.02>

The participation of trainees in breast cancer surgery is often a concern to patients. The effect of trainees' involvement during surgery on patient's safety and satisfaction in term of complications, oncologic and cosmetic outcomes is not fully known. Currently, there is limited and conflicting data on the outcomes of trainees' involvement in breast cancer surgery. Most of the studies were of retrospective nature with small numbers. Also, the true extent of involvement and supervision of the trainees in the surgery were often not clearly defined in the studies (1-5). There were also major flaws in the design of some studies. In the analysis of outcomes in these studies, there were no differentiation on whether the residents participated in cases of palpable tumour or not (4) or if the patients had invasive ductal carcinoma or pure ductal carcinoma in situ (DCIS) alone (1,3), which severely affected the validity of the results.

Srour *et al.* (6) tried to overcome some of the current studies' limitations by investigating the effect of residents and fellows participation in breast conserving surgery for invasive breast cancer on oncologic outcomes, namely positive margin rates. This study is one of the largest to date, involving 1,089 patients operated from 2005–2015 at a single tertiary care hospital. Over the 10 years study period, based on the change in SSO/ASTRO re-excision margin guidelines, there was also an adjustment in the definition of positive margin used in the study. Positive margin was defined as cancer or DCIS present within 2 mm and no tumor on ink of the resected margin before and after April

2014 respectively. The practice of selective shave margins was also adopted in 2011.

In their study, 11 attending surgeons were surveyed on whether they would allow the trainee, listed on the operative report, to independently perform the entire operation, based on tumour palpability and the level of training of the trainee. Based on the survey results, the case was categorised into surgeon or trainee operated, with the latter cases further subcategorised based on the trainee's level of training.

The mean age of patients in their study was 63 years and 70.1% of the cases needed preoperative localisation, with a median size of 1.3 versus 2.2 cm for palpable cancers. Overall positive margin rate was 24.9%. For both non palpable and palpable cancers, there was no statistically significant difference in the positive margin rates between the surgeons and the various groups of trainees of different operative experience. Collectively, the attending surgeons and fellows had shorter median operative times compared to the senior and junior residents, with an average difference of 19.5 and 13.3 min, between the 2 groups, for the non palpable and palpable cancers respectively.

Limitations of the study included its survey methodology which may result in recall bias and may not be an accurate reflection of the actual involvement of the trainees in the operation. Inclusion of all the trainees involved in the operation may not have been recorded.

On the other hand, the advantages of this study included its large sample size, analysis of outcomes based on tumour

palpability with inclusion of fellows. Also, only invasive cancers were included in this study as DCIS itself is known to be a risk factor for positive margins (7).

In literature, various parameters had been compared between trainees and consultants. For operative parameters, early complication rates appeared to be similar between the trainees and consultants in studies involving breast conserving surgery and mastectomies (2,5). Operative times were however, reported to be longer for the trainees compared to the consultants (2,3,5,6), with the timings becoming shorter as the trainees progressed in their training (2). Despite the difference in operative timing between the trainees and the consultants, this timing difference did not seem to have a detrimental effect on patients' clinical outcomes.

For oncologic parameters, positive margin rate was the most studied parameter. For palpable breast cancers, the trainees and consultants had comparable reported positive margin rates (1,7) which were consistent with Srour *et al.* (6) findings. For non palpable cancers, the data was conflicting. Operating on non palpable cancers is presumed to have a steeper learning curve as it requires the surgeon to also have a mental three dimensional perception of the operating field. Dixon *et al.* (8) reported a higher re-excision rate in patients operated on by unsupervised trainees. This finding was also supported by other studies suggesting that the non palpable cancers should be operated by specialists (7) or senior residents or consultants (1) only with no difference in positive margin rates noted between senior trainees and consultants (9). Another study, however, had shown that junior trainees participation did not affect the positive margin rates adversely (3). In this study however, the junior trainees were directly supervised by surgical oncologists who scrubbed in the operation as well.

In studies where there was no explicit distinction of resident involvement based on tumour palpability, the positive margin rate was not increased by the participation of the trainees (4).

In other studies also evaluating the effect of trainees participation on positive margin rates, it appeared that the experience and surgical skills adequacy of the trainees were more crucial factors affecting positive margin rates (4,10,11). In trainees with subjectively assessed unsatisfactory surgical skills, greater participation by the surgeons could help negate the higher associated positive margin rates (11). It is difficult to quantify the sufficient experience level needed for oncologic breast surgery; however, one study had postulated that for non palpable cancers, the learning curve

for surgeons using wire localisation was about 40 cases (12).

Another often studied oncologic parameter was local recurrence rates which had been reported to be similar, after a follow-up ranging from 3.6 to 5.5 years (5,9), for the breast oncologic surgeries performed by the trainees or consultants.

While allowing the trainees to participate in the operations as part of their training is imperative, it is also paramount that the patients' safety do not get compromised as a result. The surgical doctrine of '*See one, do one and teach one*' has undergone a paradigm shift and it may be now more apt to say '*See many, do and teach one when ready*'. In order to ensure that the patients' safety is not compromised, the recurring message from the published papers was that experience does matter to a certain extent and that the attending surgeon should have complete autonomy over the entire surgery for all his patients, especially in deciding how much participation each trainee is capable of partaking in every operation. The trainees should be supervised during the operation and only be allowed to operate independently after exhibiting competency, which is achieved through repetitive practice. Once competency is established, the oncological outcomes may not differ much between the surgeons and trainees, though the trainees may still require a longer operating time.

A common shortcoming of the published studies thus far is that the exact extent of trainees participation in the surgery is often difficult to define and assess, especially since the studies were retrospective in nature. Further research is needed and if possible, a prospective study designed to overcome this problem. While larger volumes of breast excision could result in lower positive margin rates, a larger excision volume conversely could also result in a poor cosmetic outcome (13). As a result, the cosmetic outcome after breast conserving surgery, performed by the trainees or the consultants, should be assessed. So far, only a 30 days post operation early cosmetic outcome has been reported to be comparable in operations with or without residents' participation (5).

Standardisation of margin definition and use of shave margins should also be used as this could bias the reported outcome of positive margin rates (14).

Interestingly, the studies thus far, were predominantly from Northern America with some from Europe but there is no Asian study investigating the outcomes of participation of trainees in breast conserving surgeries. It will be intriguing to see the effects of trainees participation on a worldwide scale.

Also, with the increasing use of oncoplastic breast surgery worldwide (15), the assessment of effect of involvement of trainees in oncoplastic breast surgery should be the next focus of research.

In conclusion, the current limited literature revealed trainees to be a little slower than the consultants. Otherwise, there appears to be no increased operative or oncologic risks due to the participation of the trainees. In patients with non palpable breast cancers, the data on the effects of trainees is conflicting. More research, detailing precisely the extent of involvement of the trainees, is needed in future.

Acknowledgments

None.

Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

- Cleffken B, Postelmans J, Olde Damink S, et al. Breast-conserving therapy for palpable and nonpalpable breast cancer: can surgical residents do the job irrespective of experience? *World J Surg* 2007;31:1731-6.
- Chatterjee A, Pyfer B, Chen L, et al. Resident and Fellow Participation in Breast Surgery: An American College of Surgeons NSQIP Clinical Outcomes Analysis. *J Am Coll Surg* 2015;221:988-94.
- Aguilar B, Sheikh F, Pockaj B, et al. The effect of junior residents on surgical quality: a study of surgical outcomes in breast surgery. *Am J Surg* 2011;202:654-7; discussion 657-8.
- Plichta JK, Perez CB, He E, et al. Does practice make perfect? Resident experience with breast surgery influences excision adequacy. *Am J Surg* 2015;209:547-51.
- Tsigonis AM, Landercasper J, Al-Hamadani M, et al. Are Breast Cancer Outcomes Compromised by General Surgical Resident Participation in the Operation? *J Surg Educ* 2015;72:1109-17.
- Srouf MK, Manguso N, Mirocha J, et al. Impact of Resident and Fellow Participation on Surgical Outcomes in Breast Conserving Surgery for Invasive Breast Cancer. *J Surg Educ* 2019. [Epub ahead of print].
- Heiss N, Rousson V, Ifticene-Treboux A, et al. Risk factors for positive resection margins of breast cancer tumorectomy specimen following breast-conserving surgery. *Horm Mol Biol Clin Investig* 2017. doi: 10.1515/hmbci-2017-0023.
- Dixon JM, Ravisekar O, Cunningham M, et al. Factors affecting outcome of patients with impalpable breast cancer detected by breast screening. *Br J Surg* 1996;83:997-1001.
- Moorthy K, Asopa V, Wiggins E, et al. Is the reexcision rate higher if breast conservation surgery is performed by surgical trainees? *Am J Surg* 2004;188:45-8.
- Shirah GR, Hsu CH, Heberer MA, et al. Teaching residents may affect the margin status of breast-conserving operations. *Surg Today* 2016;46:437-44.
- VanderVelde J, Walters JW, Hsu CH, et al. Awareness of residents' technical ability can affect margin status in breast conserving operations. *Breast Cancer Res Treat* 2019;177:561-8.
- Tóth D, Varga Z, Sebő É, et al. Predictive Factors for Positive Margin and the Surgical Learning Curve in Non-Palpable Breast Cancer After Wire-Guided Localization - Prospective Study of 214 Consecutive Patients. *Pathol Oncol Res* 2016;22:209-15.
- Lim G, Pineda LA. Applicability of Oncoplastic Breast Conserving Surgery in Asian Breast Cancer Patients. *Asian Pac J Cancer Prev* 2016;17:3325-8.
- Baliski CR, Pataky RE. Influence of the SSO/ASTRO Margin Reexcision Guidelines on Costs Associated with Breast-Conserving Surgery. *Ann Surg Oncol* 2017;24:632-7.
- Piper M, Peled AW, Sbitany H. Oncoplastic breast surgery: current strategies. *Gland Surg* 2015;4:154-63.

Cite this article as: Lim GH. Trainees participation in breast cancer surgery: an assistance or a hinderance? *Gland Surg* 2019;8(6):596-598. doi: 10.21037/gs.2019.12.02