

## Peer Review File

Article Information: <https://dx.doi.org/10.21037/gs-23-433>

### Reviewer A

The article presents data from a national database. It provides relevant information on the subject, and provides information on the current trend in the use of mastectomies and implants.

Reply: Thank you for the thoughtful review. We genuinely appreciate the insightful comments provided, and we have diligently incorporated the valuable suggestions you offered.

pg6, line 9 - Describe how patients were randomized to create different groups.

Reply: We apologize for the ambiguity in our statement. While patients were not individually randomized, the National Patient Sample (HIRA-NPS) data utilized in our study is a stratified random sample, meaning it represents a 3% (2009-2018) or 5% (2019-2020) subset of the Korean population selected in two stages:

1. Stratification: The Korean population was divided into subgroups (strata) based on patient age (16 categories at 5-year intervals) and gender. This ensures the sample reflects the actual population distribution and avoids bias towards specific groups.
2. Randomization: Within each stratum, individuals were randomly selected to create the final sample. This randomness further guarantees the sample represents the specific characteristics of each population subgroup.

Therefore, while individual patients were not directly randomized into groups for our analysis, the underlying structure of the HIRA-NPS data ensures a representative and unbiased sample of the Korean population, allowing us to draw conclusions about treatment trends in DCIS management. We have modified the text to provide greater clarity.

(Page 6, line 12)

The National Patient Sample (HIRA-NPS) includes a stratified random sample of 3% of the total patients during each annual period from 2009 to 2018 and 5% during 2019 and 2020.

pg6, line 15 - describe whether the diagnosis used (ICD D05) is defined through the result of percutaneous biopsy (pre-surgery) or the final pathology; clarify what the procedure will be in the event of a discrepancy (if any).

Reply: Thank you for your insightful comment. We appreciate your attention to detail. Due to the frequent occurrence of invasive carcinoma being diagnosed in the final pathology after surgery or cases where only DCIS remains after neoadjuvant chemotherapy, patients with an invasive carcinoma code before and after DCIS diagnosis were excluded.

After extracting the list of patients with D05, individuals who had been diagnosed with C50 were excluded. As a result, only patients with D05 diagnosed in both percutaneous biopsy (pre-

surgery) and the final pathology, and without breast cancer, were included in the analysis. We have added text.

(Page 6, Line 18-19)

Individuals diagnosed with invasive breast carcinoma (C50), whether before or after the diagnosis of DCIS, were excluded.

It would be interesting to describe the screening guidelines for breast cancer in Korea, as well as adherence by the population. Mention whether there were any changes to these guidelines during the analysis period.

Reply: Thank you for your suggestion regarding breast cancer screening guidelines in Korea. We appreciate the importance of providing this context for a comprehensive understanding of our study.

In Korea, the National Cancer Screening Program is instrumental in breast cancer screenings, advocating mammograms every two years for women aged 40 or older. Notably, the breast cancer screening rate showed a significant increase from 33% to 72% between 2004 and 2012, reflecting a positive trend in adherence to screening recommendations. However, post-2012, the rate experienced a decline and stabilized between 60-66%.

It's crucial to note that throughout our analysis period, there were no alterations to these screening guidelines. We have incorporated this information into the manuscript as advised.

(Page 5, Line 6-9)

In Korea, the National Cancer Screening Program plays a crucial role in breast cancer screenings, advocating mammograms every two years for women aged 40 or older. The breast cancer screening rate exhibited a notable increase from 33% to 72% between 2004 and 2012.

If possible, it would be interesting to mention in detail (even as part of the text) whether there has been an isolated increase in subcutaneous mastectomies, since these are often associated with reconstruction with implants.

Reply: Thank you for your perceptive comment on the potential isolated increase in subcutaneous mastectomies. We recognize the significance of this aspect in the context of reconstructive surgery trends. Regrettably, a separate analysis specifically focusing on subcutaneous mastectomies within our dataset was not feasible. However, your suggestion has enriched our consideration of the evolving landscape of reconstructive surgery.

In the discussion, we have incorporated your insight to highlight the notable rise in total mastectomy (TM) rates, suggesting a potential correlation with an increase in subcutaneous mastectomies.

(Page 11, Line 16-17)

Consequently, the noteworthy rise in TM rates likely corresponds to an increase in subcutaneous mastectomies.

## Reviewer B

\* Limited Insight into Causal Factors: While the study observes trends, it does not delve into the reasons behind these changes, such as technological advancements, changes in clinical guidelines, or patient preferences.

Reply: Thank you for the valuable feedback. We recognize the significance of comprehending the underlying reasons for observed trends. As a response, we have added a discussion on the analysis of the causes behind the shift in surgical approaches and the adoption of hypofractionation RT. You can find these additions in the revised manuscript.

(Page 10, Line 27 – Page 11, Line 3)

The move from mastectomy to lumpectomy with radiation is influenced by the increased diagnosis of small-sized DCIS, propelled by expanded screening programs (2). Increased patient preference for breast conservation and robust clinical evidence are also contributing to this shift.

(Page 12, Line 5-7)

Clinical evidence and the establishment of hypofractionated RT as a standard treatment for invasive carcinoma are considered the main factors contributing to the growing adoption of hypofractionated RT.

\* Absence of Multidisciplinary Perspectives: The abstract does not indicate if the study considered insights from multiple disciplines, which is often critical in understanding complex treatment trends in oncology.

Reply: We appreciate your insight into the importance of multidisciplinary perspectives in understanding complex treatment trends in oncology. In response to your comment, we want to clarify that our study indeed considered insights from multiple disciplines, including surgeons, plastic surgeons, and radiation oncologists. Throughout the study, we have incorporated perspectives from these disciplines to provide a comprehensive understanding of the changing landscape of DCIS treatment in South Korea.

Abstract

Methods: We examined annual variations in mastectomy types, reconstructive procedures, and RT utilization from a multidisciplinary perspective.

Conclusions: Our study sheds light on the changing landscape of DCIS treatment in South Korea incorporating perspectives from surgeons, plastic surgeons, and radiation oncologists.

\* No Discussion on Cost Implications: Treatment changes, especially in surgical methods and RT, have financial implications which are not discussed. Please add this to the discussion or limitation section

Reply: Thank you for your insightful feedback. We appreciate your keen observation regarding the absence of a discussion on cost implications in our study. Recognizing the importance of

this aspect, we have included comprehensive discussions on the financial considerations associated with treatment changes, particularly in surgical methods and RT.

(Page 11, Line 8-11)

According to a study, after NHIS coverage expansion, surgery-related costs, including anesthesia, inpatient care, and medication, decreased by half. Some patients strategically scheduled cancer operations post-April 2015 to lower expenses. A rise in post-2015 delayed breast reconstruction among breast cancer survivors with deformities may be attributed to reduced costs (21).

(Page 12, Line 18-22)

In South Korea, the cost analysis indicates that Hypofractionated RT (42.56 Gy/16 fractions) led to a significant saving of 675.64 USD (26.6% reduction) compared to conventional RT (50.4 Gy/28 fractions). The reduction in patient out-of-pocket costs is approximately 34.80 USD. Furthermore, the adoption of hypofractionated RT has the potential to further decrease indirect costs by shortening the treatment period to two weeks (29).

These additions aim to provide a more comprehensive understanding of the multifaceted factors influencing the evolving landscape of DCIS treatment in South Korea, including the financial considerations associated with treatment choices.

## **Reviewer C**

The article includes a large sample of patients and provides valuable information on evolving treatment of DCIS. Weighting the smaller sample to represent the whole Korean population has limitations, but I consider the solution and the justification to be sufficient.

Thank you for your insightful comment and kind words of understanding. I appreciate your taking the time to read my article and acknowledge the effort and labor invested in its creation.

I have only a few minor notifications:

1. The authors should present how the screening for breast cancer has been organized in Republic of Korea, and which women are offered screening. This helps readers from different health care systems to interpret the results.

Reply: In Korea, breast cancer screening involves mammograms conducted every two years for women aged 40 or older. The National Cancer Screening Program (NCSP), initiated in 1999, initially provided free screenings to Medical Aid beneficiaries. Since 2004, the program expanded its coverage to include both Medical Aid recipients and National Health Insurance beneficiaries in the lower income stratum, encompassing over 98% of the population. Notably, the breast cancer screening rate witnessed a significant increase from 2004 to 2012, rising from 33% to 72% at an annual rate of 4.05%. Post-2012, the rate experienced a decline and stabilized between 60-66%. We added the text as advised.

(Page 5, Line 6-9)

In Korea, the National Cancer Screening Program plays a crucial role in breast cancer screenings, advocating mammograms every two years for women aged 40 or older. The breast cancer screening rate exhibited a notable increase from 33% to 72% between 2004 and 2012 (2).

2. Abstract: line 11 -> instead of “number” of BCS, the authors probably mean relative proportion, as the numbers are given in percentage? The sentence should be clarified.

Reply: Thank you for bringing this to our attention. You are correct; the intention was to represent the annual proportion of lumpectomy procedures relative to the total number of surgeries. We appreciate your clarification suggestion. The revised sentence now accurately reflects this.

(Page 4, Line 12)

The proportion of lumpectomy procedures increased from 56.7% to 65.4%, showing a greater growth rate than that of total mastectomies.

3. Page 6: patient selection: the authors have supposed that patients not undergoing RT during the same year as surgery for DCIS to have undergone mastectomy. This is not true as the RT is usually given at least a month after the surgery, so approximately 10 % of the patients must be classified erroneously. Please comment.

Reply: Thank you for your insightful observation. You're correct in noting that our assumption about patients not undergoing RT during the same year as surgery for DCIS potentially misclassifies cases, particularly for those who received lumpectomy in December and underwent RT the following year. This introduces a limitation in our study.

To ensure transparency, we will explicitly address and discuss this issue in the limitations section of our paper. This will provide clarity on the potential misclassification and its impact on our findings. Your feedback is invaluable, and we thank you for bringing this to our attention.

(Page 13, Line 13-15)

An example is the possible misclassification of lumpectomy patients who underwent surgery in December using N7135 code and received RT in the subsequent year, potentially leading to misrepresentation as mastectomy cases.

4. Page 10: lines 22-23: the authors claim that the glandular tissue is entirely removed when mastectomy is performed. This is not completely accurate, as there is some small amount of glandular tissue that is not removed in mastectomy, which has been shown in multiple studies. This is associated with the fact that prophylactic mastectomies do not prevent having breast cancer completely, it just diminishes the risk. Please rephrase.

Reply: Thank you for bringing this to our attention. We appreciate your clarification regarding the removal of glandular tissue during mastectomy. You are correct in noting that the statement "the breast glandular tissue is entirely removed during mastectomy" is not entirely accurate.

While the majority of glandular tissue is removed, a small amount might still remain. We have revised the text to better reflect this nuance.

(Page 10, Line 25)

Given that the vast majority of the breast glandular tissue is removed during mastectomy, the incidence of invasive breast cancer recurrence is extremely rare.

### **Reviewer D**

In this comprehensive analysis the authors investigate evolving treatment patterns and trends in the management of DCIS in South Korea using the Korean Health Insurance Review and Assessment

7 Service-National Patient Sample database. The paper is well written, with precise description of the methods used for the selection of patients. Results are shown in a correct way with the use of appropriate graphics. It's a very interesting and actual paper due to ongoing debate regarding the different ways to treat DCIS.

Thank you for your insightful review of our DCIS paper. We appreciate your positive feedback and will continue our research to improve patient treatment.

I suggest to the authors, only, to add in in your discussion this recent article for local recurrence after breast conserving surgery in patients affected by ductal carcinoma in situ in Europe : Tomasicchio G, Picciariello A, Stucci LS, Panebianco A, Montanaro AE, Cirilli A, Punzo C. Outcome and risk factors for local recurrence after breast conserving surgery in patients affected by ductal carcinoma in situ. *Minerva Surg.* 2022 Dec;77(6):536-541. doi: 10.23736/S2724-5691.22.09284-X. Epub 2022 Mar 1. PMID: 35230036.

Reply: We sincerely appreciate the reviewer's insightful suggestion. In response to the recommendation, we have thoughtfully incorporated the pertinent findings from the recent article by Tomasicchio et al. (*Minerva Surg.* 2022) into our discussion. This addition provides valuable insights into the latest perspectives on the treatment of DCIS.

(Page 10, Line 19-22)

A recent study found that BCS + adjuvant RT had a low 6% overall recurrence rate at 85 months follow-up, with margin status, multifocality, hormone receptor status, and Her-2/Basal-like subtype identified as risk factors for local recurrence (17).