

Peer Review File

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Comment 1 : There was similar report (J Ultrasound Med. 2019 Jun;38(6):1649) in the PubMed. What is the novel idea in the paper? Please elaborate in the introduction.

Reply 1 : Thanks for the positive comment. Recently, research has focused on predicting whether pure DCIS diagnosed preoperatively by CNB could upstage after surgery through the models built by some corresponding clinical factors , and this report (J Ultrasound Med. 2019 Jun;38(6):1649) was similar. However, the evaluation of some of these clinical factors is subjective, and the factors are difficult to apply in clinical practice. Compared with the report , we develop an ultrasound-based deep learning model and there are no AI studies that use ultrasound images to predict the postoperative upgrade of pure DCIS diagnosed by CNB .We have described in the introduction (see line 10-12, Page 5, line 1-11, Page 5).

Changes in the text : None

Comment 2 :What is the meaning of “DCISM and IDC” in the abstract? Why in the title of the paper to use “predict underestimation”?

Reply 2: Thank you very much for your comments. We are sorry for the lack of the full description. The DCISM means Ductal carcinoma in situ with microinvasion and IDC means invasive ductal carcinoma. The definition of DCISM means the extension of cancer cells beyond the basement membrane into the adjacent tissue with no focus more than 1mm in greatest dimension. We had added the specific introduction in the article.

Some researches got the conclusion that about 12%-32% of cases diagnosed by CNB before surgery upstaged to microinvasion or even to invasive cancer on postoperative specimen analysis, which means there is a phenomenon of underestimation in preoperative diagnosis. u

Changes in the text: We have supplemented the full description of DCISM and IDC (see line 9-10, Page 3).

Comment 3 : There were several grammar errors in the text. Such as “patients diagnosed with breast cancers diagnosed newly” in the introduction.

Reply 3: Great thanks for your suggestions. We are sorry for the grammar errors and unsuitable expressions. And our paper has got a language editing and the grammar errors has been corrected. Although there are a lot of modifications, but the logistical framework is still the same.

Changes in the text : The paper has got a language editing and the modification can be track, the words in blue in ‘track mode’ would be the modification.

Comment 4 : In the introduction, please enrich the progress of the diagnosis for DCIS.

Reply 4: We sincerely appreciate the valuable comments. We have enriched the progress with below description in the paper.

“Presently, DCIS is mainly screened using mammography. Its main imaging manifestation is the presence of clustered microcalcifications, but this feature is not unique to DCIS. Therefore, it is difficult to distinguish DCIS from invasive carcinoma using imaging studies. In addition, postoperative upstaging is observed in patients diagnosed with DCIS using puncture biopsy. Distinction between DCIS and invasive

carcinoma before surgery has been addressed previously”

Changes in the text : See line 14-20, Page 5.

Comment 5 : Please supplement the progress of the treatment for DCIS in the introduction.

Reply 5: Thanks for the positive comment. We have enriched the progress of the treatment with below description in the paper.

“Presently, the main treatment of DCIS is surgery. For a breast mass, the treatment would include mastectomy or lumpectomy plus radiation therapy. According to the American Society of Clinical Oncology guidelines, patients diagnosed with pure DCIS by core needle biopsy (CNB) before surgery should undergo sentinel lymph node biopsy (SLNB) if they choose mastectomy (2); patients who undergo lumpectomy should undergo SLNB if DCIS is upgraded postoperatively.”.

Changes in the text : See line 6-12, Page 4.

Comment 6 : Why to focus on DCIS in the paper? Please supplement in the introduction. Why some patients with DCIS after surgery will upgrade?

Reply 6: Thanks for your questions. We focus on DCIS with the reasons below: the incidence of DCIS is relatively high; the routine imaging examination is difficult to distinguish DCIS, DCISM and IDC; the treatment of DCIS is also controversial in situ tumor of the breast, such as in the management of lymph nodes. We have supplemented the controversy specifically in the article.

The major cause of the upgrade is insufficient sampling of CNB, and others like imaging manifestations, biopsy techniques and the size of the DCIS would also affect the preoperative diagnosis. We have supplemented the cause in the article.

Changes in the text : See line 13-21, Page 4.

Comment 7 : When the cases were enrolled? Please illustrate clearly in the methods.

Reply 7: Great thanks for your suggestion. We are sorry to neglect the time of the whole data, and we have added the sentence “In conclusion, the data was collected between March 2016 and July 2018”, and we have added the statement in the paper in the methods.

Changes in the text: See line 2-3, Page 7.

Comment 8 : In the figure 2 legend, please supplement the description of figure 2.

Reply 8: Great thanks for your suggestions. Figure 2 shows the complex and diverse ultrasound images of DCIS. In graph (a), calcification is the main manifestation. In graph (b), Duct abnormalities is the main manifestation. In graph (c), Mass is the main manifestation. In graph (d), Structural disorder is the main manifestation. We have described more specifically in the legend.

Changes in the text: See Page 21.