Dear editors and reviewers,

We are grateful to you for your valuable comments and suggestions which help us to improve the quality of the manuscript. We have study the comments carefully and have made modifications and corrections which we hope meet your approval. We revised the manuscript according to all of your kind advices and detailed suggestions. Here below is our description on revision.

Editor:

Response: We have revised the manuscript such as title, ORCID number, statements, article highlights, references, and so on as the editor's suggestion.

Reviewer 1:

The authors demonstrated almost identical survival curves of pT1N1and pT1N2 or pT1N3a and pT1N3b gastric cancer patients in SEER cohort. From this finding, they proposed new staging system combining pT1N1and pT1N2, or pT1N3a and pT1N3b, which showed better discrimination and they confirmed it in FMUUH data set. Generally, the study is well designed and clearly written. p7 "a significant differences", p8 "nTNT" and "optima" need to be corrected.

Response: Thank you for the reviewer's comments on this study. We have revised the "a significant differences" to "the significant differences"; and "nTNT" to "nTNM" in the manuscript with red color.

Review 2

The authors described the lack of the 8th TNM staging system with respect to N classification in early gastric cancer. They used the SEER data set in US and the FMUUH dataset of their own to calculate the overall survival rate in surgically-treated patients with gastric cancer. The results were unique and important in some extent, but there are many criticisms for publication.

1. It is well known that the sixth and seventh edition of the AJCC staging system were not well distributed with respect to the survival curve for patients

with EGC. Therefore, the present results are not so surprising.

Response: Thank you for the reviewer's comments on this study.

Although there were some studies had showed that the sixth and seventh edition of AJCC staging system were not well distributed with respect to the survival curve for patients with early gastric cancer (EGC) [1, 2], in the current study, we also found that no significant differences were observed in OS between N1 and N2 cancers or between N3a and N3b EGC according to the eighth edition AJCC staging system. EGC is a special type of tumor that comprises of T1 (invading the mucosa or submucosa) tumors irrespective of lymph node metastasis. So, the aim of this study was to establish an appropriate N classification system for EGC. We have added these in the "Discussion" section with red color.

2. The TNM staging system quite often differs from other staging systems based on the local cohorts because both characteristics of patients with gastric cancer and treatment strategies are not equivalent. For this reason, the version up is mandatory. The general rule to describe the staging is more important.

Response: The American Joint Committee on Cancer (AJCC) staging system is the most important and widely used staging system for gastric cancer worldwide. Since the first AJCC staging of cancer published in 1977, there were eighth editions which have been changed a lot base on the treatment strategies and big database. However, as the founding editors adroitly noted that: "Staging of cancer is not an exact science. As new information becomes available about etiology and various methods of diagnosis and treatment, the classification and staging of cancer will change."[3] In the current study, we found some new information of the N classification for EGC base on a large simple size database, which may be helpful to develop an optional staging system for early gastric cancer. We have added these in the "Introduction" section with red color.

3. Data collecting periods from both SEER and FMUUH cohorts are long. Between 1997 and 2014, there are many epoch making events. Especially, chemotherapy and endoscopic excision are important.

Response: There was a limitation that the data collecting periods were a little long in this study, and there were some epoch events, such as chemotherapy and endosopic excision. However, our manuscript was focus on early gastric cancer, and most of them were not needed chemotherapy. Additionally, we only included patients with at least 15 lymph nodes examined in our study which might have sufficient LNs to check the LN status for early gastric cancer. So, there are still some meaningful findings from this study. We have added this in the “Limitation” section with red color.

4. The enrollment of patients in the FMUUH data set are unknown. The consort diagram is necessary.

Response: Patients in the FMUUH data set were enrolled with the similar inclusion of SEER data set: (1) histologically confirmed primary gastric adenocarcinoma; (2) at least 15 lymph nodes examined; (3) no distant metastasis; (4) radical gastrectomy with R0 resection and regional lymphadenectomy. We have added these in the “Patients” section with red color.

5. The limitations which the authors stated in Discussion have to be emphasized in more detail at the beginning of Discussion.

Response: We have revised the limitation with more detail in the “Discussion” section in red color.

6. In this study, the numbers of patients with T1N0 and T1N1 or more in the cohorts used are not described. If the number of T1N1 or more is small, the power of this study would be very limited.

Response: There were 1814 patients with pT1 stage, and the T1N0 were 1353 patients, the T1N1 were 235 patients, the T1N2 were 139 patients, and the T1N3 were 87 patients. To the best of our knowledge, this is one of the largest simple sizes for early gastric cancer with at least 15 lymph nodes examined. We have added these in the “Results” section with red color.

7. The legends of figures must be more clearly stated for the readers.

Response: We have revised some the legends of figures and made them more clearly stated for the readers.

Review 3

The authors raise their opinions of setting a new N category for early gastric cancer. This is a pioneer study. However, I have the following comments:

1. In the part of PATIENTS AND METHODS, please add the description of Exclusion criteria of patients. Besides, please clarify the patients whether they have received neoadjuvant treatment first.

Response: Thank you for the reviewer’s comments on this study. Patients received radiotherapy or chemotherapy prior to surgery was excluded in the current study. We have added the exclusion criteria in the “Patients and methods” section with red color.

2. The main difference between old and new N categories for early gastric cancer is only on T1 group. However, in the new system, T1N3b was classified into category IIB instead of IIIB. What is the actual benefit of patients in the following decision-making process in choosing adjuvant treatment or not?

Response: In the new system, the T1N3b was classified into category IIB instead of IIIB based on the patients’ survival, which is benefit for more actually predicting the survival. For stage IIB gastric cancer patients, adjuvant chemotherapy still should be chose according to the NCCN guideline. We have added this in the “Discussion” section with red color.

3. About the title of this manuscript, the word “CANCER” should be changed to “ADENOCARCINOMA”.

Response: We have change the “CANCER” to “ADENOCARCINOMA” in the title with red color.

Review 4

In this retrospective study, Lin and colleagues developed a novel TNM staging system with a better predictive ability that can be used to accurately predict the 5-years OS of patients with early gastric cancer. Although this study has some limitations as they noted, they analyzed a large number of cases and applied X-tile analysis with optimal cut-off point. The main statistical analysis is well described and will likely become a cited example of how to manage gastric cancer after surgery.

Minor point 1. In Table 1, total patients number of SEER set should be 10,714

Response: Thank you for the reviewer’s comments on this study. We have revised the number in Table1.

In conclusion, we have checked the manuscript and revised it according to all the comments. We submit here the revised manuscript as well as a list of changes. If you have any question about this manuscript, please don’t hesitate to let me know.

Sincerely yours,

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1. Choi KH, Kim BS, Oh ST, et al. Comparison the sixth and seventh editions of the AJCC staging system for T1 gastric cancer: a long-term follow-up study of 2124 patients. Gastric Cancer. 2017, 20(1):43-48.

2. Al-Refaie WB, Tseng JF, Gay G, et al. The impact of ethnicity on the presentation and prognosis of patients with gastric adenocarcinoma. Results from the National Cancer Data Base. Cancer. 2008, 113(3):461-9.

3. Amin MB, Greene FL, Edge SB, et al. The Eighth Edition AJCC Cancer Staging Manual: Continuing to build a bridge from a population‐based to a more "personalized" approach to cancer staging. CA Cancer J Clin, 2017, 67(2): 93-99.