Author's response to reviews

Title: Cone-beam computed tomographic evaluation of styloid process: A retrospective study of 208 patients with orofacial pain

Authors:

Haluk Oztunc (halukoz@cu.edu.tr)
Burcu Keles Evlice (burcukeles@yahoo.com)
Ufuk Tatli (dr.ufuktatli@gmail.com)
Ahmet T Evlice (aevlice@yahoo.com)

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Author's response to reviews: see over
Dear Dr. Thomas Stamm, Editor-in-Chief;

We would like to submit our revised manuscript entitled “Cone-beam computed tomographic evaluation of styloid process: A retrospective study of 208 patients with orofacial pain” to Head and Face Medicine. The point-by-point responses to the comments of the reviewers are listed below:

Response to Reviewers’ Comments:

Reviewer 1:
Dear Reviewer, thank you for your encouraging comments about our paper.

Reviewer 2:
Dear Reviewer, thank you for your contributory comments about our paper. Our responses to your comments are listed below:

Comment 1: It is not clear how those patients were included in the study? (i.e. did they refer to neurology department or faculty of dentistry?)

Response: It was described (highlighted with red color) in the first paragraph of the “Materials and Methods” section: “The patients suffering from neurological symptoms in maxillofacial region who had referred to neurology department at first and then consulted to the faculty of dentistry for CBCT examination were included in the study.”

Comment 2: If these patients referred to faculty of dentistry, I wonder how detailed are the records kept considering the neurological complaints of the patients. As this study has a retrospective nature, the records should have been kept quite detailed.

Response: The patients referred to neurology department at first. When ES was suspected as an initial diagnosis, the physician consulted the patients to maxillofacial radiology department. Thus, clinical records of the patients were composed of those both taken in the neurology and maxillofacial radiology departments.
**Comment 3:** How and why did the authors suspect of ES in these patients and required CBCT for styloid process evaluation? The neurological examination performed to the patients and other similar conditions mimicking ES should be discussed.

**Response:** During neurological examination, the neurologist evaluated and recorded the complaints of the patients including pain, dizziness, tinnitus, otalgia, dysphagia, foreign body sensation, and pain on turning head in maxillofacial and neck region. When the neurologist suspected of ES during clinical examination due to the corresponding complaints of the patients, the physician consulted the patients for CBCT imaging in order to differentiate the diagnosis. This was the patient population included for the present study. The conditions mimicking ES had already been discussed in the 2nd paragraph of the “Discussion” section.

**Comment 4:** In Materials and Methods section it is stated “all kind of discomfort”. Please explain what kind of discomfort.

**Response:** It was explained (highlighted with red color) in the “Materials and Methods” section: “Clinical symptoms including pain and all kind of discomfort in the maxillofacial and neck region including dizziness, tinnitus, otalgia, dysphagia, foreign body sensation, and pain on turning head were recorded from the patients’ charts.”

**Comment 5:** It is stated on page 5 that the measurements were performed by the same radiologist but on page 10 regarding authors’ contributions it seems that 2 authors performed the measurements. Please clarify.

**Response:** It was corrected and clarified: “Two authors performed the measurements. If they did different measurements, they discussed until agree with each other.”

**Comment 6:** I believe that the neurological part in whole study is not satisfactory. May be the neurologist author should be more involved in planning and discussion of the study.

**Response:** The role of the neurologist author was explained in detail: The neurologist author collected the clinical records of the patients including pain, dizziness, tinnitus, otalgia, dysphagia,
foreign body sensation, and pain on turning head in maxillofacial and neck region. He was also actively involved in planning the study as well as discussion of the study. Additional discussions were also added in the 2nd and 3rd paragraphs of the “Discussion” section by neurologist author: “…In case of head and face pain refractory to treatment or unexplained neurologic complaints of head and neck region, ES could be considered in the differential diagnosis...The incidence of the ESP is controversial (ranges between 1.4% and 30%) in the literature [2, 6, 8]. The incidence of the ES is much lower than the incidence of ESP. Only small percentages (between 1% and 5%) of the patients were reported to actually be symptomatic [7, 10]. The results of the present study showed that 54% of the study population had ESP which could contribute the complaints of the patients. The higher incidence rate observed in the present study might be due to the special study population suffering from orofacial pain. The results also revealed that ESP seems to be related with the appearance of certain neurological symptoms presented in Table 4.”

Comment 7: The correlation between presence of styloid elongation and neurological complaints is not clear.

Response: This might be due to the retrospective nature of the study in a special patient population suffering from orofacial pain. According to the results of the present study; the patients suffering from orofacial pain, who also had ESP, had increased rate of corresponding neurological complaints compared with non-elongated ones. Further clinical studies, also including patients with ESP but without any complaints, is necessary to evaluate the exact correlation between presence of styloid elongation and neurological complaints.

Reviewer 3:

Dear Reviewer, thank you for your contributory comments about our paper. Our responses to your comments are listed below:

Comment 1: The aim of the study has to be more clear and consistent to the statistics used later in the study. In addition the aim of the study in the abstract has to be the same as the one reported in the introduction.

Response: The aim of the study was described in detail according to the statistics used in the study. Moreover, the aim reported in the abstract was corrected as same as the one reported in the introduction: “The purpose of this study was to assess the structural characteristics of styloid process
(SP) by cone-beam computed tomography (CBCT) examination in a patient population suffering from orofacial pain. The second aim was to assess the prevalence of elongated SP and its relation to gender, site and subjective symptoms in the study population.”

Comment 2: The reported conclusions are not based on the study results and are not consistent with the aim of the study.

a. "...elongated SP should be considered in patients suffering from orofacial pain". I believe that we cannot really say that as there was no control group (without pain complaints) included in the study. In addition, 46% of the patients included in the study had not-elongated SP. The elongated SP seems to be related with the appearance of certain symptoms presented in Table 4.

Response: The reported conclusion was corrected: “Within the limitations of the present retrospective study in a special patient population; it was observed that the patients suffering from orofacial pain, who also had ESP, had increased rate of corresponding neurological complaints compared with non-elongated ones. Further clinical studies, also including patients with ESP but without pain complaints, is necessary to evaluate the exact correlation between presence of styloid elongation and neurological complaints.”

b. "CBCT is an effective method in the evaluation of length...and high quality images". This study did not examine the efficiency of using the CBCT in making the necessary measurements. This study presents the CBCT as an alternative method to CT or panoramic radiographs for the measurement and the assessment of the styloid process.

Response: The reported conclusion was corrected: “This study presents the CBCT as an alternative method to CT or panoramic radiographs for the measurement and the assessment of the styloid process.”

Comment 3: The section of statistical analysis and results are not clearly written. The reasons why the given tests were chosen are also not very clear in the text. It could be easier for the reader to understand the results if the same order was used in both sections (statistics, results).

Response: The section of statistical analysis and results were detailed. The reasons why the given tests had been chosen were described in detailed in the text: “...The appropriate method to test the statistical significance of difference in a classification system was Chi-square test. So, Chi-square test
was used to assess the prevalence of the calcification type and pattern of SP among site and gender. Due to the number of the patients and normal distribution of the data, a parametric test, independent sample t-test, was used to compare the mean age of the patients, and mean angle and length of SP according to gender and elongation status. The appropriate method to calculate the ratio of the odds of the outcome in two groups in retrospective studies was Odds ratio test. So, Odds ratio test (OR) was used to compare the prevalence and the ratio of the odds of the subjective symptoms in patients with and without elongated SP…”

In the results section, the names of the used statistical methods were written in parentheses.

In the second paragraph of the “Results” section, a clear explanation was added at the end of the following sentence: “…In terms of the patterns of SP calcification, statistically significant difference was only found in Pattern C among gender and site prevalence (Chi-square test) (P=0.011) (Table 1). The prevalence of Pattern C styloid process in males was significantly increased in the right site. However, it was significantly increased in the left site in females…”

In terms of statistical methods, same order (chi-square test, independent sample t-test, and odds ratio, respectively) was used in both sections (statistics and results).

**Comment 4:** Minor revision in Introduction section: Page 3 the sentence “Palpation of the styloid ...styloid” has to be rephrased.

**Response:** The corresponding sentence was rephrased: “Palpation of the styloid process (SP) in the tonsillar fossa is indicative of elongation.”

**Comment 5:** Minor revision in Material and Methods section: In the second paragraph I believe that it would be beneficial to the reader if the list of the clinical symptoms that were examined was briefly mentioned.

**Response:** The list of clinical symptoms that were examined was briefly mentioned: “Clinical symptoms including pain and all kind of discomfort in the maxillofacial and neck region including dizziness, tinnitus, otalgia, dysphagia, foreign body sensation, and pain on turning head were recorded from the patients’ charts.”
Comment 6: Minor revision in Discussion section: Page 9. The second sentence in the last paragraph “The reason for different variations...imaging methods”; instead of “was” better to use “could be”, as this is an assumption of the authors and not a certainty. In addition the authors could explain it a bit more, since this seems to be an important part of the study.

Response: The corresponding sentence was corrected according to the comment: “The reason for different variations in the measurements of SP in various studies could be the difference in imaging methods.” An explanation was also added: “The assessment of the length of SP might be effected by the magnification of the panoramic devices and by the angulations of the SP in 2D imaging technology.” Moreover, further explanations had already been made in the 5th paragraph of the discussion section: “…Most frequently a panoramic radiograph is used to determine whether the SP is elongated...”

Comment 7: Minor revision in Discussion section: Page 10 “narrower angle values” instead of “narrow angle values”

Response: The corresponding sentence was corrected according to the comment: “Similary, female patients had significantly narrower angle values than...”

Comment 8: Minor revision in Discussion section: Page 10 “which makes female patients ... complaints”; better to use “which could make female patients...” as again this is an assumption of the authors.

Response: The corresponding sentence was corrected according to the comment: “which could make female patients more prone to corresponding complaints.”

Corresponding Author:

Dr. Ufuk TATLI, DDS, PhD

Assistant Professor, Department of Oral and Maxillofacial Surgery

Çukurova University Faculty of Dentistry, 01330, Balcali, Adana / TURKEY