

## Peer Review File

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### Reviewer A

Comment 1: First of all, the manuscript requires some English editing. Please pay attention to the correct punctuation. Note to the entire article: look for interesting synonyms for "good". This word is definitely overused in the whole article. Please be creative and use such words as "favorable", "in favour of", "excellent", "outstanding", etc.

Reply 1: This manuscript has been edited by AJE(An English language polishing organization, website:<https://www.aje.cn>).

Comment 2: Below are some examples of places that I think need to be improved linguistically.

Reply 2: Line 82 write "keywords" together.

Changes in the text: We have modified our text as advised (see Page 3, line53).

Line 105 Please put a comma between "deformity" and "second".

Reply: We have modified our text as advised (see Page 4, line73).

Line 105-108 First sentence of the introduction - please simplify it or split it into two shorter sentences.

Reply: We have modified our text as advised (see Page 4, line73-75).

Line 111 "development" does not seem to be the most appropriate expression here. Maybe it is better to use the word "maturation"? Or to shorten this sentence at all? Earlier, you used growth - it seems understandable to the reader.

Reply: We have shortened this sentence as advised (see Page 4, line75).

Line 185 Please put a comma between "parents" and "depending".

Reply: We have modified our text as advised (see Page 5, line115).

Line 230 - maybe instead of "main" use the word "central"?

Reply: We have modified our text and the figure as advised (see Page 7, line149-153, Figure 4).

Line 234 - I think that since the sentence is in present tense, it should be "vary" instead of "varied".

Reply: We have modified our text as advised (see Page 7, line151).

Line 254 - "that" is unnecessary

Reply: We have deleted "that" as advised.

Line 268 Please delete the comma after "middle".

Reply: We have deleted the comma after "middle" as advised (see Page 8, line168).

Line 325 There should be "another" instead of "other"

Reply: We have modified our text as advised (see Page 9, line196).

Line 329 I suggest a different order of the sentence: " ...could be tightened to fix the stabilizers to the ribs firmly "

Reply: We have modified our text as advised (see Page 9, line200).

Line 348 I suggest you write "numerical data" instead of "count data"

Reply: We have modified our text as advised (see Page 10, line210).

Line 348 put "the" before "number"

Reply: We have modified our text as advised (see Page 10, line210).

Line 364 Please simplify: "112 patients underwent.."

Reply: We have simplified the sentence as advised (see Page 10, line221-223).

Line 384 - I suggest using "noticeable" instead of "obvious"

Reply: We have modified our text as advised (see Page 11, line230).

Line 425 I suggest using "utterly corrected" or "corrected entirely" instead of "completely corrected"

Reply: We have modified our text as advised (see Page 12, line251).

Line 446 I suggest using "expected" instead of "normal"

Reply: have modified our text as advised (see Page 12, line262).

Line 555 - please skip "of course",

Reply: We have deleted "of course" as advised

Line 565 - "bracing"

Reply: We have deleted the whole paragraph as advised.

Line 643 - "the" operation

Reply: We have modified our text as advised.

Line 662 - delete "Actually"

Reply: We have modified our text as advised.

In addition, the article requires technical corrections.

Comment 3: **Line 112-113** Please add the appropriate citation to the sentence: " Most patients with pectus carinatum have no clinical symptoms and only go to the hospital because of cosmetic deformities."

Reply 3: We have added a citation (see Page 4, line76)

Comment 4: **Line 113-121** Please add the appropriate citation to the sentence: " They often experience feelings of shame and embarrassment as well as low self-confidence, and like to hide their chests with clothing or posture adjustments; some patients appear kyphotic in appearance, and severe physiological deformities may also affect physical, social, and mental health."

Reply 4: We have added some citations (see Page 4, line81).

Comment 5: **Line 127-143 (basically a part where you describe the types of pectus carinatum)**. I believe you should add to this section the citation from which this information was taken. But a big plus for great figures!

Reply 5: We have added some citations (see Page 4, line83). We classified pectus carinatum according to our clinical data and references as follows:

[3] Robicsek F, Watts LT. Pectus carinatum. Thorac Surg Clin. 2010 Nov;20(4):563-74.

[4] Fokin AA, Steuerwald NM, Ahrens WA, et al. Anatomical, histologic, and genetic characteristics of congenital chest wall deformities. Semin Thorac Cardiovasc Surg 2009;21(1):44–57.

Comment 6: **Line 183** "family wishes"? It is not understandable to me.

Reply 6: What we mean is to negotiate with patients' family about what kind of surgery to be performed. In order to avoid misunderstanding, we deleted the sentence. (see Page 5, line112).

Comment 7: **Line 214-216** This part is very questionable to me. What questionnaire was used? Has any of the standardized questionnaires for patients after corrective surgery been used?

Reply 7: We have modified our text as advised (see Page 6, line132-140).

Patient satisfaction was evaluated using questionnaires and was divided into four levels as follows:

Excellent: The postoperative thoracic shape completely returned to normal, and the patient was very satisfied with the therapeutic effect.

Good: The postoperative thoracic shape was significantly improved, and the patient was satisfied with the therapeutic effect.

Fair: The postoperative thoracic shape was improved, but the patient was still not satisfied with the therapeutic effect.

Poor: The postoperative thoracic shape was not improved, or even worse, and the

patient was very dissatisfied with the therapeutic effect.

Comment 8: **Line 348 -350** Was normality checked? If so, what test was used?

Reply 8: Normal distribution of the data was checked by Kolmogorov- Smirnov test. (see Page 10, line 211).

Comment 9: **Line 476-478** "excellent or good results" - what was the basis for such a division?

Reply 9: We have listed the method of division (see Page 6, line132-140).

Comment 10: **Results** Please present the results, complications, and others in the table and only cite the most important ones in the text. The reader struggles to get through this amount of information and numbers!

Reply 10: Thanks for your advice. The results were listed in table 1.

Comment 11: **Methods** The most significant disadvantage of the study is the lack of any comparison with the previous generation bar, not to mention any randomization. Can you explain why you call your analysis a cohort study? In a cohort study, we should have a group exposed to a given factor and without exposure to a given factor. What constitutes the comparative group in your case? In my opinion, this is more of a cross-sectional study.

Apart from that, no specific endpoints have been defined in the text! Please give the information about the primary and secondary endpoints in this paper.

Reply 11: Thanks for your advice, we realize that the study is indeed not a cohort study, and we have modified our text as advised (see Page 5, line107). We have also defined the primary and secondary endpoints in our text. (see Page 5, line118-119.)

Comment 12: **Discussion** The discussion, in my opinion, is too long, it touches on too many subjects. This causes the reader to lose interest in the main problem quickly. Sometimes you are discussing topics that have not been studied in your research. Such topics, in my opinion, do not need to be discussed in such detail (e.g. the topic of digital pressure calculator). Please focus as much as possible on the issues you analyzed.

Reply 12: Thanks for your advice, we have deleted part of discussion.

Comment 13: **Line 535-545** "Mustafa Yuksel [5] measured... " I do not see any point in quoting such a broad part of this paper at this point. Please shorten it or delete it.

Reply 13: We have deleted this paragraph.

Comment 14: **Line 582-590** - Please remove these numbers in parentheses! In the discussion, please focus on the conclusions and the results! We present such data in the Results section!

Reply 14: We have removed these numbers in parentheses. (see Page 16, line343-350.)

Comment 15: **Line 625-627** - "Six cases of pectus excavatum occurred in this group and seems to have no obvious correlation with the type of pectus carinatum. " Where did this conclusion come from? Has correlation been checked with an appropriate statistical test?

Reply 15: There was no statistical significance in the incidence of excavatum deformities among the three groups. (see Page 12, line266-269.)

Comment 16: **Line 697-698** Please expand this part of the discussion. The specialty of your work is that you have not compared your method with other methods!

Reply 16: We have expanded this part of the discussion. (see Page 14-16, line301-342, 379-386.)

Comment 17: **Line 699-701** "a multiple-center prospective study with large number of cases will be needed to further drawn our conclusion." This sentence is clichéd and can sum up any paper!

Reply 17: We have modified our text. (see Page 18, line391-395.).

there are still some limitations in this study. Firstly, this is a retrospective single-center study without control group, secondly, the application time of the new bar is relatively short, the number of patients with bar removal is small, we need a long-time follow up to further drawn our conclusion.

## **Reviewer B**

Please find some aspect/topics below:

Comment 1: Classification (type A, type B, type C): uncommon/unusual

Reply 1: We classified pectus carinatum according to our clinical data and references as follows(see Page 4, line83.):

[3] Robicsek F, Watts LT. Pectus carinatum. Thorac Surg Clin. 2010 Nov;20(4):563-74.

[4] Fokin AA, Steuerwald NM, Ahrens WA, et al. Anatomical, histologic, and genetic characteristics of congenital chest wall deformities. Semin Thorac Cardiovasc Surg 2009;21(1):44–57.

Comment 2: First report of H. Abramson was published in 2005.

Reply 1: Yes, we have also read the article many times.

Comment 2: Nuss bar – what is a Nuss bar? Different companies provide different Implants,

Reply 2: We mean the steel bar (Walter Lorenz Surgical, Jacksonville, FL) introduced by doctor Donald Nuss, and we have revised in the passage. (see Page 5, line111.)

Comment 3: Steel bar has to be plasticized in vitro – never heard this before; please Explain

Reply 3: We mean the bar has to be bent before implant into patients' body. We have revised the sentence. (see Page14, line296.)

Comment 4: Compression test without any differentiated measurement – uncommon and debatable

Reply 4: Based on your and another reviewer' suggestion, we have deleted the whole paragraph.

Comment 5: Pulmonary function tests were not performed because young patients (what age??) were not suitable.

Reply 5: Pulmonary function tests only performed in patients older than 18 years. We have revised the sentence. (see Page6, line127-128.)

Comment 6: CT scan after 3 months: indication? Please justify radiation exposure

Reply 6: We observed that the vast majority of patients recovered well 3 months after operation, so we chose this time as the first follow-up time. CT can better observe the shape and position of steel bar compared with chest X-ray, so we chose CT and didn't take into account radiation exposure.

Comment 7: Complications:

- 3 patients with wound infections (=> revision)
- 2 patients with nickel allergy (=> revision/bar removal); seriously acting institutions perform allergy testing before surgery

Reply: We have no equipment to test metal allergies, so we didn't perform allergy test before surgery.

- 3 patients with screw loosening (=> 2 revisions)
- 9 patients with wire breakdowns – without bar displacement – unbelievable
- 6 patients with secondary pectus excavatum (=> 3 revisions)
- Wire breakdown, bar fracture and screw loosening – could you please explain pathophysiology? E.g. high tension/pressure?

Reply: The cause of wire breakdown, bar fracture and screw loosening were generally attributed to high pressure, but it is difficult to speculate the detailed mechanism, we can only take various measures to avoid these complications. That's why we use multiple steel wires to fix bar (when wires breakdown occurred, the remaining steel wires can prevent the steel plate from shifting),and we designed the second generation of steel bar to prevent bar fracture.

• Indication:

- “the most appropriate period for MIRPC is during the rapid growth phase of puberty .....” – the patients age in this group ranged from 10 to 23 years old.

- “there is a dispute over whether the brace method or MIRPC should be used. We prefer MIRPC ...” – uncommon and debatable  
Reply: Thanks for your advice, based on your and another reviewer' suggestion, we have deleted the whole paragraph

### **Reviewer C**

Comment: Overall good paper, well written, with appropriate sourcing. My major recommendation for revision is to further describe the follow up. Follow up is a mean of 22 months but this seems like follow up after the initial operation until removal. What was the follow up exactly after removal? Longer term results are really the outcomes of interest. Also, only 64% had the bar removed? what about the other 36%? Lost to follow up or chose to retain their bar? These should all be discussed. Thanks for the paper and chance to review and congratulation on your work.

Reply: Thank you very much for your letter. We have modified our text as advised(see Page17-18, line377-384. ). We have to admit that this is the limitation of our research. We include patients from January 2018 to July 2021, and we usually remove the bar two years after operation. In fact, the vast majority of patients had the bar removal were who underwent MIRPC before July 2019, the remaining patients have not met the standard of removing the bar, so the proportion of patients had the bar removal is still relatively small, we need a longer time of follow up.