Author's response to reviews

Title: Temporomandibular joint disc repositioning using anchor: short-term follow up by magnetic resonance imaging to treat internal derangement

Authors:

ShanYong zhang (zhangshanyong@126.com)
XiuMing Liu (X.M.Liu@yahoo.com.cn)
XiuJuan Yang (X.J.Yang@126.com)
Chi Yang (yangchi63@hotmail.com)
MinJie Chen (M.J.Chen@126.com)
Majd S Haddad (M.S.haddad@uiowa.edu)
ZhuoZhi Chen (Z.Z.Chen@hotmail.com)

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Author's response to reviews: see over
Dear editor:

Thank you very much for publishing my paper in your Journal last year, and giving me the opportunity to revise my paper (1249876804304315). The paper was carefully revised according to the reviewers’ comment. I hope my paper will be published in your Journal again. If you need further information about this paper, please let me know.

Best wishes,

Yours Sincerely

ShanYong ZHANG, MD, DDS
Department of OMS
Ninth People’s Hospital
School of Medicine
Shanghai Jiaotong University
Zhi-Zao-Ju Rd., No. 639
Shanghai 200011, P.R.China
zhangshanyong@126.com
Reviewer’s report

Title: Temporomandibular joint disc repositioning using anchor: an effective method to treat internal derangement in stage III to V

Version: 4 Date: 19 December 2009

Reviewer: Tomislav Badel

Reviewer’s report:

Minor Essential Revisions

1. The final words of the title are not legible; ......in stage # to #. I also suggest a revision of the title: “Temporomandibular joint disc repositioning using anchor: short-term follow up by magnetic resonance imaging to treat internal derangement”:

   We changed the title into “Temporomandibular joint disc repositioning using anchor: short-term follow up by magnetic resonance imaging to treat internal derangement” according to the Reviewer’s comment.

2. Abstract should be more focused on the topic of the study. In the first sentence (Background), it should be precisely explained what is difficult for the patients, it is recommended to avoid expressions like “unfortunately”, “international community” and “very difficult”.

   For the abstract (Background), according to the Reviewer’s comment, we rewrite this part, which more focused on the topic of the study. The original manuscript is “The international community has been using arthroscope in the treatment of TMJ disc displacement, unfortunately, the technical requirement was relatively high, so it was very difficult for the patients in the late stages of ID, especially those with severe disc deformation or thickening bilaminar tissue. This study presented a surgical technique that used a bone anchor to stabilize the TMJ disc, and MRI evaluation was conducted to assess the disc position.

   We changed it into “Minimally invasive surgery (endoscopic) has been used to treat temporomandibular joint (TMJ) disc displacement by some international scholars since the 1990s. The common characteristic of these surgeries was the use of suturing traction to replace the disc to the normal position. However, postoperative imaging examination confirmed that most of the displaced discs had not been replaced. A close study of the representative methods of the United States (McCain, 1994) and Japan (Ohnishi, 1991) since 1994, reveals that more than 90% TMJ displaced discs were not replaced to normal position. It was more difficult to replace the disc to normal position under the arthroscopy for the patients in the late stages of internal derangement (ID), especially those with severe disc deformation or thickening bilaminar tissue. This prompted us to redesign the new technique and to replace the disc. And until now, no study has been reported to evaluate the success of this technique. In this study, we presented a surgical technique that used a bone anchor to stabilize the TMJ disc, and to assess the disc position using MRI evaluation.”

3. The first sentence in Methods should be rewritten: avoid expressions in the first person (we) and state which department and institution this study comes from.

   We state this study comes from “the department of Oral and Maxillofacial Surgery, Ninth People’s Hospital, Shanghai Jiao Tong University School of Medicine.”
4. In the Abstract body, full expressions should be given which will be shortened after first writing (temporomandibular joint (TMJ), etc.). The abbreviation CPM should be written as a full expression because it is not mentioned again in the Abstract.
We changed TMJ into *temporomandibular joint (TMJ)* and the abbreviation CPM into *continuous passive motion (CPM)*.

5. In the text, the following sentence “The procedure and the MRI evaluation were conducted at the department of Oral and Maxillofacial Surgery, Ninth People’s Hospital, Shanghai Jiao Tong University School of Medicine with the use of a disc anchor in TMJ disc-repositioning surgery” should be moved to the Methods chapter.
We moved “the procedure and the MRI evaluation were conducted at the department of Oral and Maxillofacial Surgery, Ninth People’s Hospital, Shanghai Jiao Tong University School of Medicine” to the Methods chapter (at the end of the second paragraph).

6. In Methods ‘The mean duration of ID...’ clinical characteristics of ID should be explained as well as the including criteria for patient selection and indications for the surgical treatment.
We explained the clinical characteristics of ID in the Methods chapter as the following: *The clinical characteristics of ID mainly contain snapping, pain, jaw dysfunction or movement restriction [7]*

7. In Table 1, the first line in Stage II should be eliminated.
We eliminated *the first line in Stage II in the Table 1*

8. In the chapter Results the meaning of ‘poor success’ should be elaborated on as well as the MRI or clinical criteria chosen for re-treatment: ‘A second open surgery was performed for those 3 patients and satisfactory results were obtained finally.’
In the results, we added the sentence *3.70% of the joints (3/81) were evaluated as poor, in which the disc was not replaced. The MRI or clinical criteria were referred to the reference 12*

9. Discussion is focused on various aspects of surgical treatment of TMJ disorder; there is no discussion about other, less invasive, nonsurgical and also effective treatment modalities. Some data about the relationship between MRI findings related to patients and asymptomatic volunteers should be given. Other treatment modalities aim to improve TMJ function, without intervention in the anterior displaced articular disc. In this paper, stronger criteria for the patients who require surgical treatment should be given.
*In the discussion, we mainly talk about the surgical treatment using anchor. In this paper, the criteria for the patients who require surgical treatment had already been given in the methods.*

Language is satisfactory, with only minor revisions necessary.
Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I declare that I have no competing interests.
Reviewer's report

Title: Temporomandibular joint disc repositioning using anchor: an effective method to treat internal derangement in stage to

Version: 4 Date: 14 December 2009
Reviewer: Andrew J Sidebottom

Reviewer's report:

1. This is a well written and researched report of a modification of a commonly used technique for repositioning the disc in the TMJ. The authors do not well define the patients for whom the technique would be used as simply a displaced disc with MRI findings is not an indication for surgery, the patients additionally needing to have symptoms of pain and or restriction.
   
   *We chose the patients according to the diagnostic criteria of Wilkes-Bronstein classification for TMJ disorders, and introduced the detailed inclusion criteria in page 4.*

2. Additionally many authors would still recommend initial management with arthroscopic lysis and lavage, prior to considering open joint surgery. There is also considerable controversy in the management of disc repositioning surgery at all, with significant evidence of a recurrence of symptoms after a few years and indeed the authors state that they would want to assess the long-term outcome presumably for this reason - which I believe they should state.
   
   *In the future, we would take MRIs at longer term follow-ups to evaluate the quality of outcomes just like the reviewer—Larry Wolford' recommendation*

3. There is no mention of how they assessed the outcome as excellent or good and this need to be defined.
   
   *In fact, we had introduced the method to access the outcome as excellent or good in the reference 12*

4. They also mention that a number of cases required modification of the condyle in addition. This makes the group non-homogenous as a condylar shave is a separate procedure. The authors should state how many required condylar adjustment and place these cases in a separate group.
   
   *In the future, when taking longer term follow-ups to evaluate the quality of outcomes, we will set a separate group for the patients with condylar shave.*

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Needs some language corrections before being published
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests: I declare that I have no competing interests
Reviewer's report

Title: Temporomandibular joint disc repositioning using anchor: an effective method to treat internal derangement in stage to

Version: 4 Date: 24 December 2009
Reviewer: Siegfried Jank

Reviewer's report:

The study is lacking in several points:

1. Inclusion criteria: The most well-known scale for the definition of Temposomandibular Diseases in the CDC-scale by Truelove et al. I miss this definition for TMD. *We added the the diagnostic criteria of Wilkes-Bronstein classification for TMJ disorders, and introduced the detailed inclusion criteria in page 4.*

2. The results section is poor, only percentages were calculated and no statistical evaluation was performed. A control-group is completely missing. *In the future, when taking longer term follow-ups to evaluate the quality of outcomes, we will set a control group.*

3. The interpretation of the results is lacking. A method for disc repositioning should lead to good long-term result which was not observed by the study. There exist plenty of methods of disc-repositioning which all work initially. The question is, whether there are any good long-term results, which the study can not prove. *In the future, we will take a longer term follow-ups to evaluate the quality of outcomes*

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.
Reviewer's report

Title: Temporomandibular joint disc repositioning using anchor: an effective method to treat internal derangement in stage to

Version: 4 Date: 23 December 2009

Reviewer: Larry Wolford

Reviewer's report:

This paper evaluates 81 consecutive patients with 81 TMJs operated with TMJ internal derangement between December 1, 2003, and December 1, 2006. All patients had magnetic resonance imaging (MRI) and clinical examination before surgery and then MRIs were taken between one to seven days post surgery. The authors state that a progressive physical therapy regimen and home exercises (or CPM exercises) were carried out for about three months. They also state that in patients with postoperative occlusal changes an "orthopedic traction" was exerted continuously to stabilize the occlusal changes. Postoperative the authors report that the MRIs confirmed that 77 of the 81 joints were excellent and one joint was good with an effective rate of 96.30%. Only three patients required a second open surgery. The authors concluded that "this procedure has proved successful results in the treatment of TMJ ID", although the evaluation was only short term (1 to 7 days). They conclude that "the disc repositioning using anchor is an effective treatment method for TMJ ID". This is an interesting paper from several view points. I was very much interested in this paper because it is one of the first papers by different authors that support the use of condylar anchors to stabilize the articular discs. An interesting point is that these are 81 consecutive patients with displaced articular discs, but apparently the patients all had unilateral displaced discs since only 81 joints were treated. In my experience, the majority of patients have bilateral disc displacements. Is a unilateral disc displacement a common finding in their culture or do they just select cases with unilateral disc displacements to perform this procedure, or do they only treat one side, even though the discs were displaced in both sides? I think this would be important and interesting information to include. In my experience, patients with Stage 4 internal derangements often do not do well with disc repositioning surgery and may commonly require total joint prostheses. However, with a follow-up of 1 to 7 days, almost any procedure will "look good" with imaging as the only criteria for success. The authors adequately describe the surgical technique. The true value of this study was to evaluate disc position within one week post surgery. No other factors were studied. What criteria did the authors use to determine whether cases were excellent, good, or poor in quality of outcome? It appears in the MRI imaging, particularly in image E, that the disc has been over corrected and posteriorly displaced. In figure D, the disc certainly does not appear to be in normal configuration with the condyle and articular eminence. Patients with post surgical malocclusion were treated with "traction treatment" but the results of occlusion, function, pain, etc., were not presented in this paper. Those who understand joint anatomy associated with displaced articular discs would understand that when discs are repositioned that this will predictably cause a shift in the occlusion, displacing the involved condyle and mandible downward and forward. Since all these cases appear to be unilateral cases, this would shift the condyle on the ipsilateral side downward and forward causing the chin and occlusion to shift towards the contralateral side and would shift a Class I occlusion to a Class III end-on relationship on the ipsilateral side with a posterior open bite as well as shift the occlusion to a cross bite on the contralateral side. Essentially all these patients would have to
be placed into this "traction treatment." What is this traction treatment? How many of these patients had malocclusion post surgery and what were the long-term outcomes? Essentially all the patients would have required this treatment if they had good occlusions before surgery. With this traction device, this would place significant loading into the TMJ and could cause subsequent disc redislocation, increased pain and dysfunction, and accelerated arthritic changes. However, since no clinical objective or subjective evaluations are included, then eliminate any reference to post surgical patient management and focus on the purpose of this paper: 1 to 7 day MRI post surgical evaluation of disc position.

RECOMMENDATIONS FOR THIS MANUSCRIPT:
1. Since this manuscript only evaluates the TMJ by MRI one to seven days post surgery, then the following issues must be addressed. Do these 81 consecutive patients only have unilateral internal derangements since only 81 joints were treated? If so, this should be so stated and an explanation as to why.

   I have revised this part and stated the reason in the METHODS in page 3. Some patients suffered from bilateral joints disease, but one side did not in accordance with the diagnostic criteria of Wilkes-Bronstein classification for TMJ disorders [7], so these sides were not included in this study.

2. Eliminate any mention of the traction treatment and any other postoperative management as even relatively short-term clinical evaluations are not included in this study.

   According to the reviewer’s suggestions, we removed the sentence: Traction treatment should be performed on the patients with occlusal disorders for more than 3 to 4 weeks in the page 5 and page 8.

3. Describe the interrelationships that define whether the MRI results show excellent, good, or poor outcomes.

   In fact, we had introduced the method to access the outcome as excellent or good in the reference 12.

4. Emphasize that this is only a one to seven day follow-up study following open joint procedures using anchors to reposition the articular discs.

   Yes, we emphasized that this is only a one to seven day follow-up study following open joint procedures using anchors to reposition the articular discs and changed the title according to other reviewers’ suggestion.

5. In the conclusion paragraph, the author states that compared with other disc repositioning methods, the significant advantages of this procedure are as follows: "It is more stable for the repositioned disc to be anchored which greatly enhances the stabilization of the operation". This statement is completely erroneous and anecdotal because the result of one to seven day MRI study does not support this conclusion. Long-term treatment outcomes of at least 1 year or more are required to substantiate this statement. This statement must be removed.

   Yes we have removed this sentence: “It is more stable for the repositioned disc to be anchored which greatly enhances the stabilization of the operation.”

6. Further in the conclusions, the authors state "of all the consecutive 81 patients (81 joints), undergoing disc repositioning, postoperative MRIs confirm that over 96.30% patients had successful results". This statement needs to be changed to state that: “The discs were
adequately surgically repositioned confirmed by MRI at one to seven days post surgery.” Successful results would indicate that long term these patients did well and there is no information or evidence to support that.

Yes, we added the sentence “The discs were adequately surgically repositioned confirmed by MRI at one to seven days post surgery’ in the last paragraph.

7. The last statement must be deleted from the paper as it states that the authors’ technique is an effective method for treating TMJ ID, but a one to seven day follow-up study does not support this contention. What is very surprising in reviewing this paper is that these patients were treated between December 1, 2003, and December 1, 2006; 3 to 6 years ago, yet the follow-up is only one to seven days. What happened to the follow-up on these patients? Why is there no subjective or objective evaluation of these patients with at least a year follow-up that would evaluate and confirm the success of this procedure? What an opportunity this patient population would have provided to obtain information that could have been a major contribution to the literature if the patients were clinically evaluated long term, one to five years post surgery relative to occlusion, jaw function, pain levels, abilities to eat and chew, disability, required additional operations, the presence of headaches, noises in the joints, etc. This could have been an outstanding study, but instead it is a one to seven day follow-up of MRIs only. This appears to be a missed opportunity to provide very convincing information to the results of this technique.

Yes, according to the reviewer’s suggestion, we deleted the sentence : this technique is an effective method for treating TMJ ID in the conclusion and the last paragraph.

SURGICAL TECHNIQUE. I am a strong supporter of bone anchors and feel they help provide the most predictable method to stabilize the TMJ articular discs. I will make some constructive comments in reference to the authors’ technique.

It appears the authors strip a lot of the blood supply to the condylar head in order to put these anchors in. The periosteum is completely stripped from the condylar heads. The lateral pole of the condyle also is denuded of soft tissue attachment. This over-exposure of the condylar head can increase subsequent condylar arthritic changes and resorption. Better results can be obtained by keeping as much soft tissue attached to the condyle as possible including the periosteum, tissues attached to the lateral pole, etc. The anchors can be placed directly through the periostium.

I think the reviewer is right, so in the future, we will try this.

RECOMMENDATIONS TO THE AUTHORS FOR A FUTURE STUDY. The amount of information that could be obtained from this patient population long term would be very helpful and would be a major addition to the literature, but the following areas would need to be assessed:

1. Successes and failures of patients one to six years post treatment.
2. Take MRIs at longer term follow-ups to evaluate the quality of outcomes.
3. Objectively evaluate the patients relative to incisal opening and excursion movements as well as occlusal assessment (Class I, II, or III, open bite, etc.) and joint noises.
4. Subjectively evaluate the patients for TMJ pain, myofascial pain around the head and neck, headaches, jaw function, diet, disability, facial nerve dysfunction, etc. This type of information would be very helpful to improve the understanding of the TMJ treatment the
authors are promoting. Relative to this current manuscript, my comments how to improve it stand. If these changes are made as recommended, then this paper could be published to describe the immediate effectiveness of disc repositioning using the authors' anchor technique with immediate post surgical results, but all references to management of these patients post treatment and any statements that advocate that this technique is an effective method for treatment of TMJ ID must be eliminated.

*We removed the sentence: These findings indicated that disc repositioning was an effective method for the treatment of TMJ ID, although the long-term clinical and radiographic evaluations are insufficient.*

The authors need to state that this is only a one to seven day follow-up and by no means is an indication that these discs remain in place long term. This study does not confirm long-term stability nor the quality of treatment outcomes as it is only a one to seven day postsurgical imaging assessment of disc position. Further studies clinically and with imaging are necessary to confirm that this is a viable technique to stabilize the articular disc in position with anchors. This paper will need editorial help to improve the English and sentence structure.

*We will design a future study, based on the reviewer's recommendations.*

RECOMMENDATIONS. I believe this paper could be accepted if the above-stated revisions are incorporated for this manuscript.