Author’s response to reviews

Title: In situ laser fenestration for revascularization of aortic arch during treatment for iatrogenic type A aortic dissection

Authors:

Minjian Kong (kmj@hz.cn)
Jianfang Qian (cardioqjf@126.com)
Qunjun Duan (dr_dqj@163.com)
Xuebiao Li (lixuebiao150501@126.com)
aiqiang dong (dr_dongaiqiang@sina.com)

Version: 1 Date: 19 Feb 2019

Author’s response to reviews:

Dear editors,

Thank you for considering the publication of our research in your journal. After carefully read the ‘Reviewer reports’, we made a revision. The revised content was marked by red color in our revision.

Reviewer reports:

Reviewer #1: Congratulation for performing such an interesting procedure and the obvious success you had with that technique. The case report is an interesting first step using that technique, but just as you mentioned, now we need a series of procedures published to really assess the advantages of the operation.

Thank you very much. We are really pleased that you are interested in this procedure. From November 2016, our department began to perform this technique (holmium laser in situ fenestration to preserve the branches of the superior aortic arch) (Chinese Journal of General Surgery, 2018,33(3): 205-207). And before we prepared this manuscript, we had done more than 30 cases. The success rate of operation was 100%, No major complications occurred.

Intraoperative iatrogenic type A aortic dissection is a rare complication of cardiac surgery (an incidence of 0.06% to 0.23%). Although, it is associated with worse outcomes than spontaneous aortic dissection, there is no guideline for treatment. The risk factors included increased age and atheromatous disease at the site of cannulation. Previously, it can be treated successfully with
conservative medical management, open surgery. Recently, the feasibility, effectiveness, and safety of endovascular aortic repair had been evaluated in our center. So we presented our case to discuss the advances of in situ laser fenestration for revascularization of aortic arch as an alternative treatment for iatrogenic type A aortic dissection. We will collect more cases in the future to really assess the advantages of the operation compared with open surgery in this type disease.

Reviewer #2: The title of this manuscript must be revised. It must be suitable with the details of case presentation.

Thank you very much.

The title of this manuscript is revised as ‘In situ laser fenestration for revascularization of aortic arch during treatment for iatrogenic type A aortic dissection’

For prevention of misunderstandings, the chronological sequence of events must be narrated beginning from today retrospectively.

Done

Systematic application of cardiopulmonary bypass technique must be clarified. The details of insertions of sheaths for stents must also be mentioned.

Thank you very much. Systematic application of cardiopulmonary bypass technique had been clarified in our revised manuscript.

Systematic application of cardiopulmonary bypass technique: A purse suture was made at the proximal end of bilateral common carotid artery with 5-0 suture. A 12-16 F catheter sheath was inserted into the proximal end of the common carotid artery through the center of the purse suture. The left femoral vein was punctured and 20 F catheter sheath was inserted. The sheath tubes of left, right and left femoral vein were connected respectively for femoral vein-bilateral carotid bypass.

Insertions of sheaths for stents: Left radial artery was implanted with 7F 90 cm long sheath (or brachial artery incision case with 7F 55 cm long sheath).

The type of laser may be included.

In our group, we performed in situ laser fenestration with holmium laser, the energy was 0.5 J and the frequency was 5 Hz.

Reviewer #3: Review:
Thank you for your manuscript. It's an interesting case report. However, it has many limitations as listed below.

* Abstract

1. You should avoid from the abbreviations in the abstract and keywords.

Thank you very much.

Done

2. You could better to use page number in the manuscript.

Done

3. At the line 17 in the 3rd page and at the line 36 in the 4th page, you mentioned the type of biological valve in the parenthesis. Is the type of biological valve Ewards or Edwards?

The patient was treated with open cardiac aortic valve replacement previously. A biological valve was implanted in his heart. (25#, Edwards).

4. Where did you do the in situ laser fenestration procedure and how? Could you explain this issue in the abstract?

We do the in situ laser fenestration procedure at our one-stop hybrid operating room. We had built a digital integrated hybrid operating room in 2010, and was the first hospital in Zhejiang Province, independently carry out heart hybrid surgery.

* Case presentation

1. Why didn't you think to treat him when the patient came to you for the outpatient control? Why did you follow-up him with the medical treatment? Why didn't you follow-up the patient in hospital up to the treatment?

Thank you very much.

We really had the dilemmas between conservative or endovascular treatment. The patient had no chest pain, tightness, syncope, nausea and vomiting. We hoped aortic disease could be stabilized by medical treatment before repair successfully.

We did not follow-up him with the medical treatment after one month. In the case of local and uncomplicated dissection, the conservative treatment could be enough. However, in the case of
extended dissection, with possible hemodynamic instability and complications due to dissection, covering proximal rupture with stenting appears important in securing safe medical outcome. The classical, open surgical intervention is not recommended taken in mind that patients who underwent cardiac surgery have a very high operative risk.

The reason of why we didn't follow-up the patient in hospital up to the treatment is we did not recognize the aortic aneurysm in hospital. On 15th May 2018, the patient underwent cardiac surgery in our hospital. During regular outpatient review, chest radiographs revealed suspected intimal patches of aortic arch and descending aorta, further, thoracic aortic angiography showed aortic dissecting aneurysm.

2. How did you do the heparin management for the extracorporeal circulation during this procedure?

Before establishment of extracorporeal circulation heparin (200mg) was administered intravenous. During extracorporeal circulation we monitored the level ACT, continuous intravenous drip infusion of heparin (20 U/kg/h) were administered if ACT below 180 seconds.

3. Did you use the filter for the carotid and subclavian arteries during the laser in situ fenestration?

We did not use the filter for the carotid and subclavian arteries during the laser in situ fenestration. We had known there are some complications in endovascular surgery, among which acute ischemic stroke is its fatal complication. The causes include cerebral thrombosis induced by catheter, guide wire and delivery system in the diseased aortic arch during operation, cerebral ischemic embolism induced by covering the ostium of left subclavian artery or even left common carotid artery by stent. Optimal heparinization, gentle operation and standardized treatment of left subclavian artery during operation can reduce complications.

4. How did you manage the treatment of the patient for the embolus or clot after the procedure?

We recommend the patient regular follow-up as outpatient.

* Discussion

1. Between the line 42 and 47 at page 5, what is your reference for these sentence that start with "Type A dissection is an aortic disease associated…"? Please add the reference.

Done
2. At the line 45 in the 5th page, 'because of' would be better English than 'owing to'.

Done

3. At the line 1 at page 6, you used TAAD as an abbreviation. Could you rewrite this abbreviation more clarify?

Done

* Conclusions

1. It could be better to expand your conclusion in the manuscript.

Done

Reviewer #4: I read with interest the paper by Kong et al from China. Congratulation for the excellent result of your technique. I have some concerns:

Minor

- Is the first time that you use this technique? Do you have other results with this approach, also for degenerative aneurysm?

Thank you very much. It was not our first time to perform this procedure.

Actually, From November 2016 to February 2017, 12 consecutive patients with aortic disease were treated with holmium laser in situ fenestration to revascularize the branches of the superior aortic arch. The success rate of operation was 100%. No type I or II endoleak occurred. One case had left branch retinal artery embolism after operation. (Chinese Journal of General Surgery, 2018,33(3): 205-207). And before we prepared this manuscript, we had done more than 30 cases.

- can you compare this operation with your results on classical surgery regarding visceral and cerebral complications?

Thank you very much.

In our center, the success rate of operation was 100%. Our patient had no related visceral and cerebral complications on immediate CT, and a follow-up CT scan 6-24 months. One case had left branch retinal artery embolism after operation. In our department, an in vitro bypass system was established and used to ensure cerebral perfusion, and the procedure of the fenestration time was less than 90 s.
Because the cases number was small, we might not compare this operation with classical surgery regarding visceral and cerebral complications.