Author’s response to reviews

Title: Extracorporeal membrane oxygenation successfully used in reversal of cardiorespiratory failure induced by atonic uterine bleeding: a case report

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Author’s response to reviews: see over
October 16, 2013
Michael Kidd, MD
Editor-in-Chief, Journal of Medical Case Reports

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Manuscript Title: Extracorporeal membrane oxygenation successfully used in reversal of cardiorespiratory failure induced by atonic uterine bleeding: a case report

Dear Dr. Kidd:

Thank you for your valuable comments. We are re-submitting the enclosed manuscript entitled “Extracorporeal membrane oxygenation successfully used in reversal of cardiorespiratory failure induced by atonic uterine bleeding: a case report”.

We have addressed all your concerns and the concerns of the reviewers by providing a point-by-point response. We are certain that our manuscript is significantly improved from the previously submitted version. We hope that you will now find the revised manuscript suitable for publication in the Journal of Medical Case Reports.

We hope to hear from you soon.

Sincerely yours,

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Comments to Editorial Team:

1. Please include the Ethnicity of the patient in the Abstract and Case presentation sections.

   We mentioned patient's ethnicity as 'Japanese'.

2. Please change the description of the patient's gender from woman to female?

   We changed all 'woman' to 'female'.
Comments to Referee 1:
Authors have shown that ECMO (V-A) saved a patient with cardiorespiratory failure due to massive bleeding of postpartum. It is valuable case report because control of bleeding during ECMO is very difficult and important.

We appreciate your comment.

Authors should describe to evaluate flow, SvO2 during ECMO and weaning from ECMO. And also authors should describe the evidence of anticoagulant therapy for the patients with massive bleeding during ECMO.

We added available SvO2 value and actual flow of ECMO in Table 1. We also mentioned about weaning from ECMO in last paragraph of case presentation. We checked the evidence of anticoagulant therapy for the patients with massive bleeding during ECMO, however clear standards are lacking. We added this information in discussion. Moreover, we introduced suggestive article about anticoagulation protocol.
Comments to Referee 2:
General comments:
The authors present a case of successful treatment by ECMO of cardiorespiratory failure after massive uterine bleeding without any hemorrhagic complication. The authors concluded that as long as meticulous examination of clotting status is carried out, ECMO should be considered as an ultimate means of life support even in the case of obstetric bleeding.

Application of ECMO in case of postpartum bleeding is challenging for medical practitioners and available published data are still lacking. This case presentation contains possibly important information for difficult decision making of ECMO indication for patients with bleeding tendencies.

We appreciate your clear assessment about this case report.

Minor concerns:
Abstract:
1) Line 4-6: “We report the first postpartum case, to our knowledge, of successful treatment...uterine bleeding.” Reference No. 8 (Reyftmann et al. Obstetric Gynecol 2006;107:511-514) has also reported a similar case report.

The case presented by Reyftmann et al. suffered from uncontrollable intra-abdominal bleeding requiring another operation during ECMO. So, we believe, our case is the first postpartum case without any hemorrhagic complications during ECMO.

Introduction:
1) Last sentence: “cardiorespiratory failure due to severe atonic uterine bleeding”.
It is unclear for this reviewer why atonic uterine bleeding leads to cardiorespiratory failure. In addition, atonic uterine bleeding seemed to be well controlled at the time ECMO was initiated. Is it better to state “after severe atonic uterine bleeding” instead of “due to severe atonic uterine bleeding”?

Thank you for your instruction. We change the phrase ‘due to’ to ‘after’.
Case presentation:
1) Third paragraph: “Echocardiography showed severe diffuse hypokinesis of the left ventricle...”

   If possible, please add the actual data of echocardiography (ejection fraction, etc) before indication of ECMO and after treatment by ECMO because the reader will be able to understand the cardiac contractile function during the procedure.

   Though we’d like to show exact data of echocardiography to clarify the indication of VA-ECMO, we regrettably did not perform quantitative measurement of cardiac function.

2) Please provide additional patient background information such as preexisting conditions.

   We clearly mentioned about her preexisting disease as “She did not have any appreciable preexisting diseases including cardiac morbidities.” at the beginning of introduction.

Discussion:
1) Second paragraph: “Because she showed no evidence of any preexisting cardiac morbidities,...”

   Please describe this content in Case Presentation, too.

   Please refer to the answer to previous question.

2) Second paragraph:
Although authors described the potential differential diagnosis of cardiac dysfunction, it is still unclear what the possible main cause of cardiac dysfunction in this case was. This case showed very quick recovery of cardiorespiratory function after initiation of ECMO. Are these diagnoses of cardiac dysfunction consistent with this case? Was the ventricular fibrillation due to persistent hypotension at ICU admission also related to this cardiac dysfunction? Please discuss more clearly.
Acute myocardial damage due to persistent hypotension and ventricular fibrillation or amniotic fluid pulmonary embolism was possible etiology for decompensated heart failure because cardiac function recovered after ECMO, as you indicated. We added this to the differential diagnoses and discussed at the end of this paragraph.

3) Third paragraph: “we tightly regulated the ACT range...”

Please clarify the meaning of “tight anti-coagulation” control. How often did you check ACT during ECMO? Please clarify this in Case Presentation.

We expanded this phrase like “we tightly regulated the ACT range kept between 160 and 180 seconds’. We also mentioned the frequency of ACT check in case presentation.

4) Third paragraph:

Authors indicated that a tight anticoagulation control during ECMO was key factor to complete the treatment without any major bleeding. But the patient’s bleeding being under control at the initiation of ECMO was also a key factor in this case.

Thank you for your comment. Bleeding under control at the initiation of ECMO is a desirable condition. We emphasized this point adding the sentence “In our patient, controlled bleeding and DIC profiles at the initiation of ECMO was one of important factors behind the success of ECMO” to earlier in this paragraph.

Conclusions

1) “As long as meticulous examination of clotting status...”

It is unclear what the difference is between the anticoagulation controls used in this case and the usual controls. Are many practitioners likely to adjust anticoagulation controls roughly or to perform over-anticoagulation controls?

The sentence of “meticulous examination of clotting status” has two meanings. One is consideration for the patient’s bleeding and DIC profiles at the initiation of ECMO. Another is tight regulation of ACT range kept between 160 and 180 seconds. So, we added “before and during ECMO” to this sentence.
Comments to Referee 3:
The authors presented successful management of postpartum atonic hemorrhagic shock complicated with cardiac dysfunction, DIC and severe respiratory failure, using venoarterial ECMO, which is congratulated. Please make the discussion points clear. What is the main reason for introducing venoarterial ECMO instead of IABP? Especially, bleeding is the major consideration for introducing mechanical support.

Thank you for your thoughtful comment. The main reason for introducing VA-ECMO instead of IABP was unsustainable oxygenation. It was life-threatening. We mentioned this situation in the third paragraph of case presentation.

By introducing venoarterial ECMO, how the condition of the patient improved? The authors described only on fluid balance during ECMO support, which is ordinary treatment. What about inotropic and mechanical ventilatory support? If the main cause of cardiac dysfunction was due to adverse effects of catecholamines and high pressure ventilation, VA ECMO should be excellent option for improving the pathophysiology of this patient.

We appreciate your important suggestion about pathophysiology. We supposed transient myocardial stunning due to persistent hemorrhagic shock or amniotic fluid embolism was possible etiology of decompensated heart failure. Previously, we reported the case of amniotic fluid embolism showing a secondary left ventricular dysfunction requiring the administration of adrenaline (Imanaka et al. Journal of Medical Case Reports 2010, 4:55). So, resting heart and lung with VA-ECMO functioned very well. We clearly mentioned the fact that “the infusion of catecholamines was discontinued and the mechanical ventilatory support was gradually decreased” in the fourth paragraph of case presentation.