Author’s response to reviews

Title: Thyroid storm after coronary artery bypass surgery: A case report

Authors:

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Author’s response to reviews:

Reviewer #1: I think this is a very good case report, however a little more objective assessment (like regular monitoring of the thyroid hormones level postoperatively documenting the trend of rise or decline) for the thyroid storm postoperatively would be more informative.

Response: Thank you for your comment. I have added more content on post-operative thyroid hormone level in the text. (Pg 5, lines 99-100)

Reviewer #2: The author presents what is likely the second case of thyrotoxicosis after CABG in adults. The first was reference 8 cited by the author (Bish et al).

In general, the paper is well written, but could use some clarity in a few areas.

Comments:

1. On pg 2 line 54 please cite the Bish reference for the CABG case report
Response: Thank you for your comment. Per your comment, I have cited the Bish reference.

Editor's comments: describe why you did not use plasmapheresis or dialysis instead of cortisone
Response: Thank you for your comment. When medical therapy fails, therapeutic plasmapheresis is an alternative treatment option. According to The American Society for Apheresis 2016 clinical practice guidelines, treatment of thyroid storm with plasmapheresis is a category III indication. This means that the optimal role of plasmapheresis in thyroid storm is not established and the decision to use plasmapheresis for this indication should be individualized based on the patient’s clinical status.

Plasmapheresis was another option for this patient, but it is a time-consuming procedure that requires appropriate donor plasma. In this case, the onset of thyroid storm was identified in the operating room and we started steroid therapy within two hours after surgery due to extreme tachycardia, which can be fatal. After administration of the steroid, the extreme tachycardia subsided.

We did not consider dialysis as a therapeutic option because dialysis is generally regarded as ineffective for the removal of thyroid hormones because they are bound to plasma proteins.
2. There are several areas where the case report wording reflects a non-English writer (e.g., pg 2 line "The patient showed extreme tachycardia" similarly pg 3 line 55 "the patient showed loss of consciousness"
Response: Thank you for your comment. I have revised these sentences accordingly.

3. Please list the normal values for your institution next to the patient's lab values on page 3
Response: Thank you for your comment. I have added normal lab values in the text.

4. Please state in further detail the "anti-thyroid" medications used pre and post-op. This will help future readers understand how to manage a similar patient with an uncommon presentation.
Response: Thank you for your comment. I have accordingly added details on the medication dosage in the text.

5. Given the patient's preop afib, was the patient in sinus or atrial fibrillation when she had her syncopal event on hospital day 8 before surgery?
Response: Thank you for your question. The patient’s EKG showed A-fib and sinus rhythm alternatively. Holter monitoring showed tachycardia (>100 bpm) for over 60% of the 24 hours during which she was monitored. During her hospital stay, a resting heart rate of 60–70 bpm was seen on day 8, and her maximal heart rate during the 6-minute walk test was 75 bpm. We confirmed that the patient was in sinus rhythm during the walk test; a subsequent EKG revealed A-fib after the first syncopal event. The second syncopal event occurred under normal heart rate and a subsequent EKG revealed sinus rhythm (63 bpm).

6. On searching Pubmed, in 2017 Marcia Rashelle Palace wrote a review entitled "Perioperative Management of Thyroid Dysfunction". Could the author please read the manuscript and determine the merits of author's recommendations on cholestyramine? PMID: 28469454
Response: Thank you for your comment. The author of this article recommends cholestyramine when a euthyroid state cannot be established in the patient prior to thyroidectomy or when an allergy to ATDs is present. The author also states that the patient should be treated with β-blockade, potassium iodide, glucocorticoids, and “potentially cholestyramine” in the immediate preoperative period.
I cannot determine the merits of cholestyramine in our case because a high-dose steroid was already used, and the extreme tachycardia subsided after steroid administration.

7. Was there a role for amiodarone to manage her tachycardia post-op? What was her rhythm--fast atrial fib?
Response: Thank you for your question. The patient’s heart rate was over 160 bpm. The basic rhythm was fast atrial fibrillation. We administered amiodarone to manage this.
Reviewer #3: the authors report on a rare case of thyroid storm after CABG. The numerous Rx may not be of great interests. As the authors have enough time prior to CABG, should they discuss the utility of plasmapheresis?

Response: Thank you for your comment. When medical therapy fails, therapeutic plasmapheresis is an alternative treatment option. According to The American Society for Apheresis 2016 clinical practice guidelines, treatment of thyroid storm with plasmapheresis is a category III indication. This means that the optimal role of plasmapheresis in thyroid storm is not established and the decision to use plasmapheresis for this indication should be individualized based on the patient’s clinical status. The patient was administered iodine solution before surgery without consideration of plasmapheresis. After the onset of thyroid storm, we started steroid therapy within two hours after surgery. We could not consider plasmapheresis after surgery because extreme tachycardia subsided after the administration of steroid.

why the authors discontinued abruptly esmolol and steroid and did not proceed to beta blocker maintenance? please discuss

Response: Thank you for your comment. Intravenous esmolol is a potent beta blocker, which can lead to extreme bradycardia and hypotension. We discontinued esmolol after normalization of the heartbeat and used oral beta blocker continuously. We started steroid therapy as recommended by an endocrinologist for three days after surgery. We should have administered an additional steroid for tapering dosage; however, the patient already had signs of Klebsiella pneumonia, and we did not use it.

when suspecting sick sinus syndrome despite thyrotoxicosis, why the authors did not discuss utility of implanting epicardial peace maker lead? please discuss

Response: Thank you for your comment. We performed implantation of a temporary epicardial pacemaker lead on the patient’s epicardium before closure of the chest. We did not use a pacemaker after surgery, because the patient did not show any bradycardia before her death.

should one check thyroid markers in the ICU?

Response: Thank you for your comment. I have added more content on the postoperative thyroid hormone level in the text. (Pg 5, lines 99-100)

I agree to consider manuscript publication after minor revision.

regards

Reviewer #4: Dr. Jae Hoon Lee presents a case of a patient with hyperthyroidism undergoing urgent coronary artery bypass grafting. Unfortunately the patient developed tachycardia which had to be treated with i.v. beta blocker therapy and due to the postulated thyroid storm a therapy
with cortisol as well. After diagnosis of pneumonia with Klebsiella pn. and installation of AB-therapy she developed multi organ failure and died on day 8. The message of this case report is of great value since prior medical optimization of hyperthyroidism is of mandatory importance in patients undergoing surgery.
Response: Thank you for your comment.