[Answering Reviewers]

<Reviewer #1.>

First of all, thank you for your report. This was an excellent case on the use of magnet mode in pacemakers to prevent the risk of EMI from the application of NMES. Moreover, both treatment plan and follow-ups were very well executed. A few issues I'd like to address in this report include:

1. In which area of the body was the NMES device placed? Which areas should be avoided so that it would not interfere with the pacemaker? If the NMES device is placed in an area where it's not supposed to be placed, can it interfere with the pacemaker even if the pacemaker has been switched to desire mode (fixed asynchronous mode)?

Answer from authors

NMES targeted pharyngeal muscles between chin and thyroid cartilages, like figure 3 in the paper. No reports have been reported that clearly stated to what point electrical stimulation should be avoided. However, as written in the paper, AHA recommends TENS not to be implemented in the torso area, and FDA states that caution and monitoring are required when applying NMES on pharyngeal area. If there is an external stimulus strong enough to cause problems with the machine and circuit itself, it is likely that pacemaker malfunctions even with the use of a magnet. However, to our knowledge, there has been no report about threshold stimulation value that pacemaker does not cause malfunctions within human body or animal under magnet mode. For this reason, even if a magnet is being used, it is necessary to closely monitor the patient’s condition while reducing external irritation as much as possible.

2. Were there any difficulties encountered during the treatment? I hope you find this comment helpful for your manuscript.

Answer from authors

Patients may feel anxious because magnet method can affect condition of the heart. As written in the text, it is important to explain the process and safety of treatment, rare but possible side effects, and expected effects to the patients.

<Reviewer #2.>

This case report is the first case that dysphagia rehabilitation that (electromagnetic interference) EMI risk was handled using mode change of pacemaker with magnet. The patient had cardiac pacemaker implanted on his left chest due to the sick sinus syndrome, when performing neuromuscular electrical stimulation (NMES), the risk of EMI should be considered. As this method was not reported and the patient obtained good therapeutic effect, it might bring new significance for the treatment of such clinical related diseases. However, there are still the following questions for the author to answer.

1. At the first step of VFSS, large amount of thin water was aspirated over vocal cord and patient coughed severely. Are there any corresponding laryngeal protection in this step at present?

Answer from authors

It can not be said there was no airway and larynx protection, because the patient coughed. In addition, movement of epiglottis and hyoid bone was also decreased, but not immobile. So we changed

"At the first step of the test, large amount of thin water was aspirated over vocal cord and patient coughed severely. Proper laryngeal protection was not seen and the test was stopped in this step."

this sentence to,

"At the first step of the test, large amount of thin water was aspirated over vocal cord. Even though the patient coughed severely, thin water in the airway was not completely removed. And the movement of epiglottis and hyoid bone was also decreased. The test was stopped in this step due to persisted ineffective cough."

The amount of material swallowed for the test was about 3cc. We carefully monitored the patient and there was no sign of pneumonia in X-ray and vital signs after the test.

And, the movement for laryngeal protection improved significantly while continuing the treatment, and only mild penetration was observed in the last VFSS performed on 360 days after initial symptom.

2. What is the specification of the magnet attached to the pacemaker? Are there specific requirements for its relevant parameters (e.g. weight, volume, magnetic or shape)? Are there any commercialized products?

Answer from authors

Magnets for changing the pacemaker or ICD's mode are sold by each manufacturers to have characteristics that can respond well to each company's machine. Since the shape of each magnet and the response when magnet is attached on it is slightly different from manufacturer to manufacturer, clinicians need to know how to use it before application. We added this part to the discussion page 9.

"In addition, since each manufacturer produces magnets suitable for their own pacemakers and guides how to use them though websites, it is important to check this contents before using magnet."

The magnet actually used in this case is a product of boston scientific that is manufacturer of the pacemaker which was inserted into the patient. But, the exact specification of the magnet could not be confirmed, because production has been stopped currently.

3. According to the existing treatment experience, cloud you add the suitable patients for the treatment in the discussion part of this report?

Answer from authors

We will add cases that magnetic application can be helpful to manage EMI risk to discussion part.

"When pacemaker or ICD is implanted in the body, in case of NMES, nerve conduction study, or electrocautery which requires electrical stimulation or repetitive transcranial magnetic

stimulation (rTMS) which makes change of magnetic field, magnet approach can be useful to minimize EMI risk.”

4. Did the author use this therapy to treat other patients after this report was submitted? Please supplement and update the relevant data on the safety and effectiveness of this treatment on patients in the part of discussion at present.

Answer from authors

Unfortunately, other patients have not been treated utilizing the same method after this case. As mentioned before, this is the first paper about magnetic mode change to the patient with cardiac pacemaker for swallowing dysfunction. Although magnetic method is very safe and has been used since the early days of pacemaker development, we could not find out recent studies or cases except we mentioned in the paper. As this method is not well known, the authors want to provide a safer option for swallowing rehabilitation. When we encounter similar cases, we have a plan to use this method and report for many clinicians.

<Reviewer #3.>

The authors presented a very impressive case report using clinical magnets to reduce electromagnetic interference (EMI) risk. A dysphagic stroke patient with cardiac pacemaker was treated with neuromuscular electrical simulation (NMES) using magnet mode change. The authors further discuss about the implications of this approach. A reviewer strongly recommends for publication of this paper with some notices.

1. Please mention the patient's consent for this treatment and approval from institutional review board if available.

Answer from authors

As we mentioned on the page 7 in manuscript, treatment proceeded after explaining the process and possible complications. To clarify the fact that we got consent from the patient, we added “and obtaining the written consent from the patient”.

″After explaining treatment process and possible complications to the patient and obtaining the written consent from the patient on 13th hospital day, first NMES was carried out for 30 minutes after the technician from the company changed pacemaker’s mode using telemetric devices, so that EMI did not interfere with the device function.”

And, this study was approved by the Hanyang University Medical Center Institutional Review Board. We added this sentence at the end of the introduction on page 5.

“This study was approved by the Hanyang University Medical Center Institutional Review Board (No. HYUH 2021-03-007).”

2. The manufacturer has mentioned this device should be used with caution on patients with cardiac demand pacemaker or other implanted electric devices. Please indicated the caution in your manuscript. small point: Does "6" indicate reference number in line 17 page 8?

Answer from authors

On page 9 of the discussion, we indicated that the Vitalstim manufacturer stated equipment should be used with caution when applying the equipment in patients with cardiac pacemaker.

And you also mentioned small point about reference number in page 8. What you said is a mistake in the process of marking the reference number. It has been modified according to notation method. Thank you and sorry for the mistake.

"Historically, magnets were used to check remaining battery life and to induce pacemaker to asynchronous mode when EMI was suspected[6]."

<Reviewer #4.>

It is a very interesting case report. There have been a few reports of electrical stimulation with cardiac pacemakers. However, this case is the first report using magnet mode change. Had this patient received no treatment other than electrical stimulation? Are other treatments like acupuncture used to treat this disease in Korea? How was it assessed at the time of admission? It might be better to answer these questions.

Answer from authors

We implemented the oromotor facilitation together with NMES. In hospitals where the patient was admitted, acupuncture was not used as treatment option. And it is not generally used when performing swallowing rehabilitation in Korea.