P 3-138

Neuromuscular Electrical Stimulation for the Dysphasic Stroke Patient with Cardiac Pacemaker

Myeongkyu Kim[1*], Mi Jung Kim[1†], Jin-Kyu Park[2]

Hanyang University Medical Center, Department of Rehabilitation Medicine[1], Hanyang University Medical Center, Department of Internal Medicine-Cardiology[2]

Introduction

Electromagnetic interference (EMI), in medical field, means disturbance generated by external source to implanted electrical devices' function. It should be taken into account when medical practice has possible risk. This is the first case report that magnet mode change of pacemaker is applied to reduce EMI risk of patient with dysphasia.

Case

A 72-year-old male, visited emergency room on 4th, August, 2017 due to dysphasia and left hemiparesis. Manual muscle test grade of left extremity was grossly F+~G. He showed severe dysphasia and dysarthria. He was diagnosed as pure motor lacunar syndrome based on clinical symptoms. Levin tube was applied on admission day. The first videofluoroscopic swallowing study (VFSS) was done at 10th hospital day and large amount of thin water was aspirated over vocal cord. (Fig 1. A) We intended to do neuromuscular electrical stimulation (NMES) of pharyngeal muscle for dysphasia, but we should consider EMI to cardiac pacemaker in his chest. The patient was diagnosed as sick sinus syndrome on April, 2016 and DDD type cardiac pacemaker (ACCOLADE™ MRI L331, Boston scientific, USA) was implanted. (Fig 1. B) On 13th hospital day after the written permission of patient, first NMES was carried out for 30 minutes after the technician changed pacemaker to asynchronous mode, with in-situ monitoring of cardiologist to manage the possible emergency. There were no problems during treatment and thereafter, we decided to maintain NMES under cardiologist's monitoring. On the next day, we taped magnet on the pacemaker like fig. 2 to change its mode. Until his discharge on 37th hospital day, NMES was applied daily with magnet mode and electrocardiogram was checked after every NMES session. After discharge, the patient maintained NMES daily during week under attendance of rehabilitation doctor. After 4th VFSS on November, 2017, Levin tube was removed and oral feeding was restarted. Mild penetration was seen on the test, but clinical symptom and pharyngeal movement was improved.

Discussion

Dysaphagia after stroke is quite common, and cardiac problem causing pacemaker Introduction is also common predisposing factor for stroke. If these two conditions are combined, it is difficult to decide the best rehabilitation tool. Traditionally, NMES applying to pacemaker patient is contraindicated. However, NMES for dysphagia after stroke is known as treatment choice. The mode change of pacemaker is another option for the dysphagic stroke patient with cardiac pacemaker under meticulous monitoring of

heart condition. Magnetic mode was available since early models of pacemaker but its use is limited, probably due to doctor's unfamiliarity. For this reason, this first case report, NMES with magnet mode change of pacemaker to dysphagia with cardiac pacemaker patient, could be a guidance to make a plan for patients under the risk of EMI.

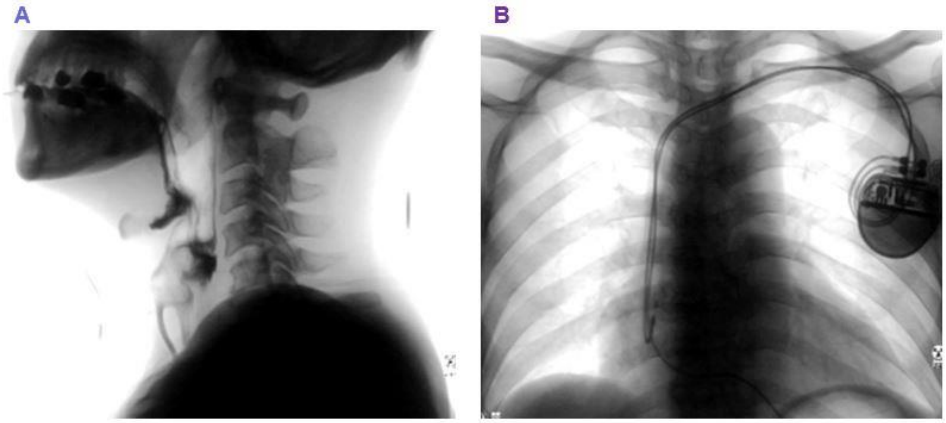

Fig 1. (A) A VFSS lateral view VFSS on 2017.08.14. The picture showed aspirated thin water to trachea. (B) VFSS AP view. Implanted cardiac pacemaker and its two leads toward right atrium & right ventricle.

Fig 2. Pacemaker location and NMES treatment with magnet.