Double Sequential Defibrillation for Refractory VFib
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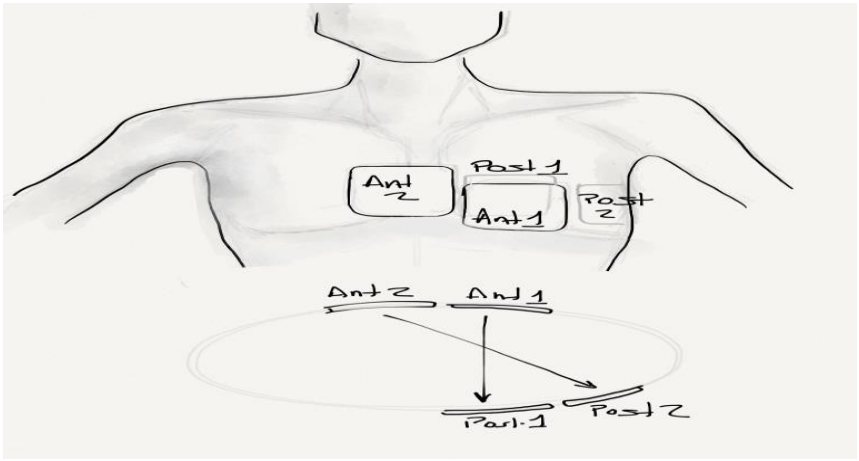
I recently was involved in a code where I saw something I had never seen before. The patient had arrested at the EMS desk and CPR was immediately initiated. She was placed in a critical care booth and ACLS was started. Initial rhythm was Ventricular Fibrillation. Initial defibrillation was set to 200J followed by Epinephrine and multiple shocks at 360J along with Amiodarone, Mg, Bicarb, D50, and CaCl. An advanced airway was placed, and after 5 shocks the resident running the code instructed the team to place a second set of pads on the patient, one over the sternum and another between the shoulder blades (see picture below). The subsequent shocks were delivered in unison with both defibrillators charged to 360J (720J total). The patient's rhythm became organized following these shocks and she eventually had ROSC after multiple shocks at 720J.

Double sequential defibrillation was something that initially was talked about by cardiologists back in the early 1990s. In 1994 there was a cardiologist in NY named David Hoch who published a paper on this method. Granted the study was small and only 5 patients with refractory vfib were included, however **all converted after double sequential defibrillation when they had failed to convert with multiple shocks at 360J**. Some experts believe this success is due to the fact that you are creating a broader vector of energy around the heart. Another thought is that it is a pure energy issue, and finally that it is a duration of shock issue. While no one truly knows why it sometimes helps, some people believe that increasing the amount of energy delivered in a shock is not always in the best interest of the patient. One study in animal models revealed that amount of joules delivered during resuscitation correlated to the amount of post-resuscitation myocardial dysfunction.



http://resusreview.com/2013/high-energy-defibrillation-for-incessant-ventricular-fibrillation/

Whether this method ultimately helps the patient or not, it is something that at least deserves to be in the discussion in our patients with refractory vfib in which all other efforts have been made to break the arrhythmia. When it comes to calling the morgue or trying out one more method that could potentially save a patient, I will be doing double sequential defibrillation. In our patient mentioned above, she was eventually taken to the cath lab after ROSC where she was found to have severe multi-vessel disease that could not be intervened upon. She died shortly after arriving in the ICU when she became bradycardic and hypotensive despite multiple pressors, and the family decided to withdraw care after she coded again. Special thanks to Dr. Michael Oubre who ran this code and taught me a little bit about double sequential defibrillation, which in turn prompted this write-up.

References / Further Reading:

1. Hoch DH, et al. Double sequential external shocks for refractory ventricular fibrillation. J Am Coll Cardiol 23(5): 1,141–5, Apr 1994.
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