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REFRACTORY VENTRICULAR FIBRILLATION/PULSELESS VENTRICULAR TACHYCARDIA DOUBLE-SEQUENTIAL DEFIBRILLATION

Background

Refractory ventricular fibrillation (VF) is defined as VF which does not convert with standard defibrillation (up to 5 cycles) even after the administration of epinephrine and amiodarone. The pathophysiology is thought to be due to sympathetic overdrive leading to cardiac instability.

As high-quality CPR and early defibrillation have been the two interventions that have been shown to increase ROSC and survival to hospital discharge⁵, it appears that the anecdotal reports of refractory VF/pulseless VT have been on the rise. Data has shown that refractory VF is associated with poor outcomes; the neurologically intact one-month survival is reported to be 5.6%⁶. As this poses a difficult situation for providers on scene with prolonged resuscitations with poor outcomes, we have included a protocol to offer double-sequential defibrillation as a therapeutic option.

Double-Sequential Defibrillation

Several case studies have been published where refractory VF has been successfully treated by the simultaneous use of 2 external manual defibrillators set at maximum energy levels⁷⁻⁹. Though this technique has not been standardized, nor endorsed by the manufacturers of defibrillators, we offer it as a last resort option in these patients until other options present themselves.

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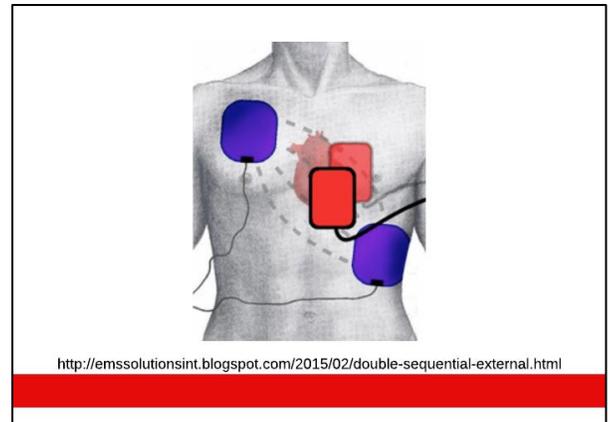
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Prior to attempting double-sequential defibrillation (DSD), it is important that you try a *different vector* for at least one shock. For instance, if your pads are anterior-posterior (red pads in diagram), place a new set of pads in the anterior-apex position (blue pads in diagram). The simple vector change may be all that is needed to convert the VF/pulseless VT.

If changing vectors has not worked, you may consider proceeding to DSD. This is *not* mandated as it is not considered standard therapy and many manufacturers of the manual defibrillators will not cover any resultant damage under the standard warranty.



The technique has been described as placing pads in the anterior-apex and anterior-posterior vectors which, if you have attempted to change vectors with a new set of pads, your pads will already be in place. Next, you will charge both manual defibrillators to their maximum recommended setting (i.e. 200 J biphasic) and once everyone is clear of the patient, simultaneously press the shock buttons (one person should press both buttons). After the shocks are delivered, start CPR. Repeat every 2 minutes as needed.

When to terminate resuscitation

Consideration for termination of resuscitation for a patient in refractory VF/pulseless VT can be made after 60 minutes (BLS + ALS time with completion of all the ALS interventions in the VF/VT protocol). Discussion with OLMC is encouraged EARLY in these cases and prior to cessation of efforts.

Citations

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