Is flat line truly asystole?

Sir,

A 72-year-old man presented with gastric outlet obstruction. He was diagnosed to have adenocarcinoma of the pyloric region. He was posted for diagnostic laparoscopy followed by total gastrectomy/ gastrojejunostomy. His general condition was poor; he was cachectic and had generalised oedema. His exercise tolerance was poor, and he was barely managing daily activities, equivalent to three metabolic equivalents. His vitals were stable. Pre-operative electrocardiogram (ECG) and echocardiogram (ECHO) were normal. The case was performed under general anaesthesia with controlled ventilation. An arterial line and a central venous pressure line were introduced. Diagnostic laparoscopy confirmed the inoperability of the case and feeding jejunostomy was planned. Patient was maintaining a normal ECG pattern on the monitor (GE B40® patient monitor, GE Healthcare United Kingdom); pulse rate was 75–80/min and invasive blood pressure (IBP) was 102/76 mm Hg. Midline incision was made; midway through the procedure, the patient developed fall in O_2 saturation. Just before the desaturation 1 mg vecuronium (top up dose) was injected through the central line inserted in the internal jugular vein. In a matter of 2 min, SpO_2 had fallen from 98 to 10. Arterial line tracing was absent. Immediate cardiopulmonary resuscitation (CPR) was started. The rhythm noted was pulseless ventricular tachycardia (VT). Patient was defibrillated with 200J biphasic defibrillator and adrenaline 1 mg was administered. Resuscitation was continued as per American Heart Association guidelines (CPR at the rate of 100/min with ventilation every 6–8 s) checking the rhythm every 2 min.[1] After 35 min of resuscitation, a stable rhythm was established. The surgeon was asked to hasten and close the abdominal defect. With the BP at 90 mm systolic, dopamine drip was started. Meanwhile, patient developed ventricular fibrillation (VF). Even after 20 min of resuscitation following advanced cardiac life support (ACLS) protocol, no evidence of cardiac activity was noticed. (Flat line seen in the ECG monitor). We were about to declare death when a timely intervention prevented a major error. We increased the gain of ECG on the monitor from 0.5 to 7, and there was perfect normal sinus rhythm. On checking carotid pulse was present. Surgery was completed, and the patient was shifted to the post-anaesthesia care unit. Patient's post-operative ECG and cardiac enzymes were normal, confirming that high-quality CPR was administered (and successful). As the hypoxic events unfolded after the injection through the central line, a possible air embolism was considered as the reason for the arrest. The post-operative ECG did not show S1Q3T3 pattern, nor any evidence of emboli; no right ventricular strain was noted in ECHO.[2] Post-operative X-ray was also normal. Patient recovered from effect of relaxant (vecuronium) after 4 h. The next morning, sedatives were stopped and sensorium assessed. He responded to oral commands. After 5 days of intensive care, he was extubated.

Asystole is defined as a cardiac arrest rhythm in which there is no discernible electrical activity on the ECG monitor. Asystole is sometimes referred to as a "flat line", which may be encountered during cardiac arrest with VF or VT, before returning to spontaneous circulation.[3] Confirmation that a "flat line" is truly asystole is an important step in the ACLS protocol. On seeing a flat line on the monitor, one has to ensure that asystole is not another rhythm that looks like a "flat line." Fine-VF can appear to be asystole, and "flat line" on a monitor can be due to operator error or equipment failure. The common cause for the isoelectric line that is not asystole is loose or disconnected leads and a low signal on the ECG monitor.[4]

We decided to post this case to highlight two main points. That adequate training helps a long way in providing high-quality CPR and that in case of asystole, simple measures such as checking the ECG leads for disconnection and increasing the gain can avoid major mistakes before deciding to stop resuscitation and declare death.

Gayathri Ramanathan, J Mahesh Kumar, G Sivarajan, P Umadevi

Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chennai, Tamil Nadu, India

Address for correspondence:
Dr. Gayathri Ramanathan,
B-102, Newry Shrenika, Jayachandran Nagar,
1st Main Road, Jalladanpet, Chennai - 600 100, Tamil Nadu, India.
E-mail: gayathrii.r@gmail.com

REFERENCES

1. Harsoor SS. Cardio pulmonary resuscitation 2010 – Improve the quality of care. Indian J Anaesth 2010;54:91-4.
2. Kosuge M, Ebina T, Hibi K, Tsukahara K, Iwahashi N, Maejima N, *et al*. Simple and accurate electrocardiographic criteria for differentiation among acute coronary syndrome, acute pulmonary embolism, and takotsubo cardiomyopathy. Circulation 2012;126 21 Suppl: A8950. [Abstracts from the American Heart Association 2012 Scientific Sessions and Resuscitation Science Symposium].
3. Ava P, Pamela O, Ahmed HI. The duration of asystole before return of an organized rhythm or spontaneous circulation after defibrillation. Circulation 2011;124:A66. [Abstracts from the American Heart Association 2011 Scientific Sessions and Resuscitation Science Symposium].
4. Asystole and Its Treatment in ACLS. Available from: https://www.acls-algorithms.com/asystole. [Last cited on 2015 Apr 15].

Access this article online	
Quick response code	Website: www.ijaweb.org
	DOI: 10.4103/0019-5049.163013

How to cite this article: Ramanathan G, Kumar JM, Sivarajan G, Umadevi P. Is flat line truly asystole?. Indian J Anaesth 2015;59: 528-9.

Announcement

Announcement: Office of ISA

ISA Office working hours: 10.00 am to 6.00 pm (Kasaragod)

Members can call Office at 04994227395 during office hours for any queries

Further queries, contact Hon. Secretary directly at 09388030395