LIDOCAINE

- Class 1B antiarrhythmic
- Decreases automaticity threshold and ventricular fibrillation threshold.
- Effective in terminating PVCs.
- Rarely used in pediatric arrests as ventricular tachycardia and ventricular fibrillation are not commonplace.

Defibrillation and Cardioversion

Objectives

- **Defibrillator & Cardio version in your hands**
- **Definitions &Types**
- **Difference between defibrillator & Cardio version**
- **Different sites of plades**
- **Clinical application**
- **When don't process**

What is Defibriallator?

DC shock = AC shock = defibrallator

- **Its an electric and electronic equipments used in the cardiac emergencies and dysrhysthmic cardiac arrest by releasing the stored electric charges in controlled fashion causing simultaneous depolarization of all abnormally excitable myocardial cells and interruption of abnormal pathways and electric foci**

Types of defibrillators

1- according to nature of electric source

a- alternative current (AC)

b- direct = constant current (DC)

AC current more stability & accuracy

2- according to mode of action

a- manual

The trained personell determines the cardiac rhythm by monitor & ECG , voltage supply , timing of shock through external paddles applied to the patient chest wall

b- automatic

The device can identify rhythm and suitable electric shock through electronic programmed monitor insitu .

3- according to site of defibrillators & electrodes

a- External

i. Manual (MED)

ii.Automatic (AED)

b- Internal

i.Manual (MID)

During open heart surgery in operating theatre

ii.Automatic (AICD) = (ICD)

iii. Wearable cardiac defibrillator (WCD)

Portable external defibrillator used in high risk frequent arrhythmia by computer technology and used during preparation for AICD

4- according to relation to QRS complex

a- unsynchoronized = defibrillator

Shock dilvery at anytime of cardiac cycle used in pulseless V tac , ventricular flutter and defibrillation

b- synchoronized = cardioversion

Asynchoronization means it's the timing of shock dilvery during R wave and away of T wave and ST segment

Used in all life-threatened tachy-arrythmias as SVT, AFt, AFib, Vtac with pulse

No shock in Asystole & PEA

5- according to electric phases

a- Monophasic

where electric current travels in one direction through the chest

High energy level is requried with skin hazarads .

b- Biphasic defibrillator

where electric current travels in two direction through the chest

In the first phase the current moves from one paddle to other as monophasic

In the second phase the current flow in the reverse direction

Low energy level is requried with very low skin hazarads 120 : 200 J (2 : 3 J/ Kg)

c-Double sequential defibrillator

Provision of rapid sequential shocks via two defibrillators with defibrillation pads placed in both planes (antero-lateral & antero-posterior)

Can be uesd in refratory venticuar fibrillation

Important Buttons of DC

2- synchoronization

3- energy adjustment

4- energy store

5- charge

6- strip ECG

7-record

8- data base

9-paddles charge

Placement of External Paddles

1- the paddles should not placed over hard thick large bones (sternum , scapula ,vertebra)

2- the paddles should not placed within 12 cm of permanent pacemaker

3- paddles maybe self-adhesive single used or reusable with K-Y jel

4- skin at paddles must protected by K-Y jel to prevent skin burn & decrease trans-thoracic impendence.

5- excessive chest hair at the paddle area may need to be shaved to achieve better electrode contact

6- better to deliver shock during expiration to avoid air space between paddles & heart

External Paddle sizes

a- adult size 8-13 cm

b- children size 8 cm

c- infant size 4.5 cm

N.B : larger possible paddle is preferred than the smaller possible why ??

External Paddle sites

a- antrolaterally

Patient in supine position :

one paddle placed on the rt 2nd intercostal space next to sternum . The 2nd paddle placed on the 5th intercostal space in the left midclavicular line (apex)

b- anteroposteriorly

the patient in the lateral position :

one paddle placed on the left 5th intercostal space in the midclavicular line. The other paddle placed posteriorlly in the left infrascapular region

Internal Paddle site

a-Atrioventricular : one paddle placed on left ventricle and the other on the right atrium

b-Biventricular : one paddle placed on the left ventricule and the other on the right ventricle

N.B: cardioversion 5-10 j

N.B : defibrillation 30-50 j

Whats the difference ?? And why ??

Doses of electric shock

a-Cardioversion :

0.5-1 j / kg

b-Defibrillator :

Monophasic 4-6 j / kg

Biphasic 2-4 j/kg

Common cardiac arrhythmias shock (Adult)

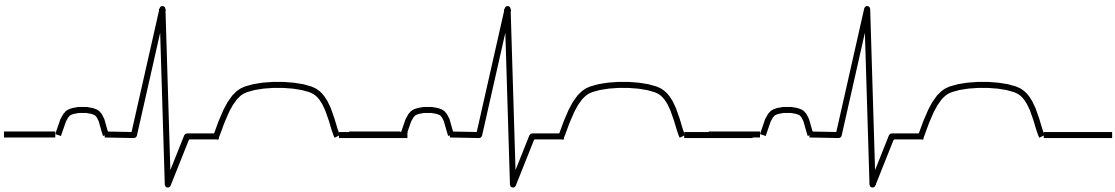
Atrial flutter : 50-100 j in adult

Atrial fibrillation 120-200 j in adult

SVT & Vtac : 120-200 j

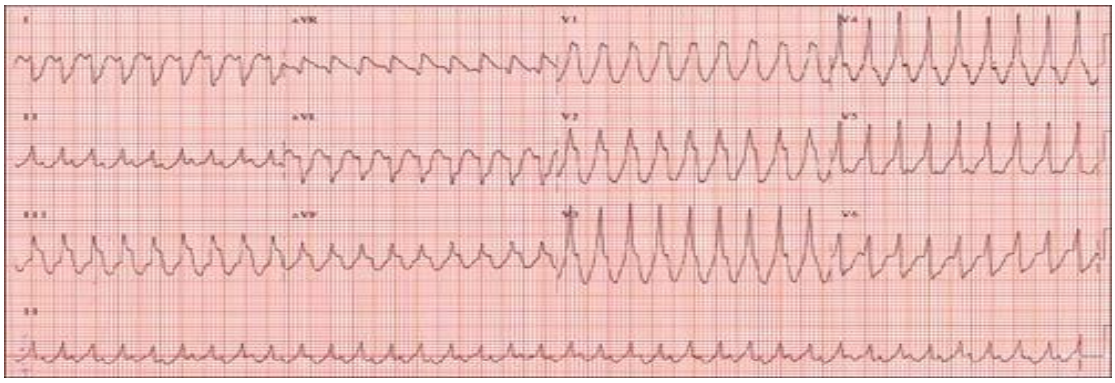
Ventricular flutter & fibrillation : 360 j

Normal sinus rhythm

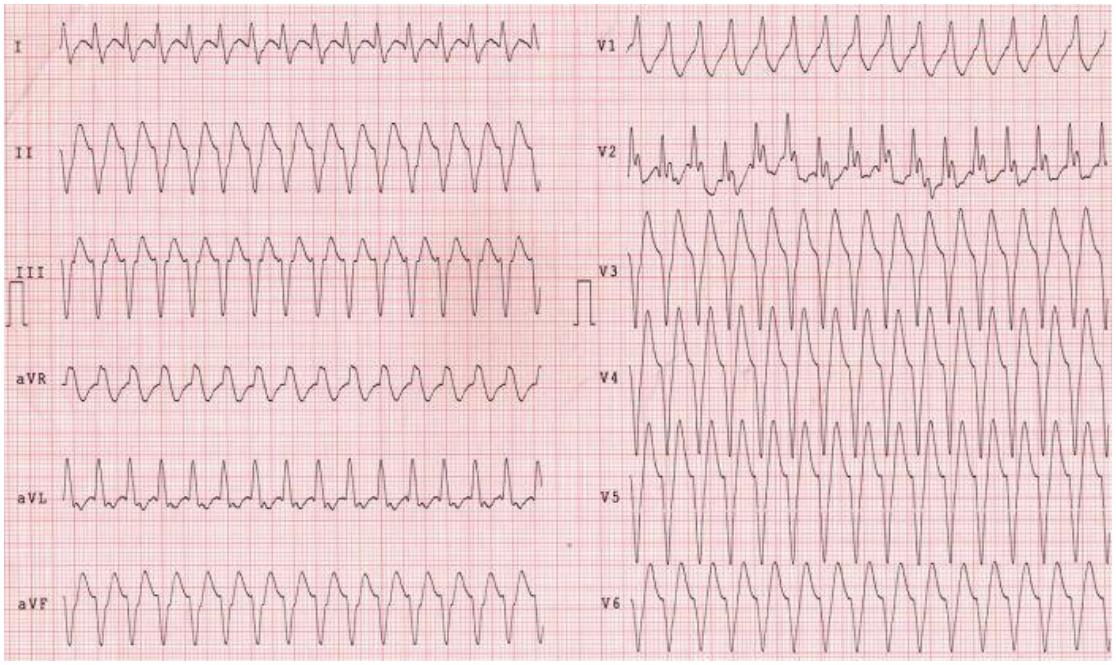


SVT

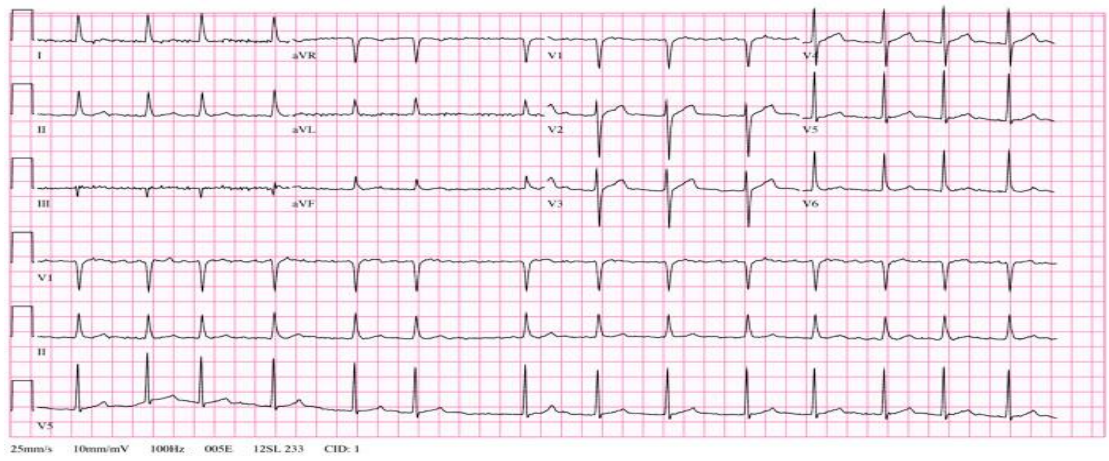
Vtac



Ventricular fibrillation



Atrial fibrillation



Atrial flutter