

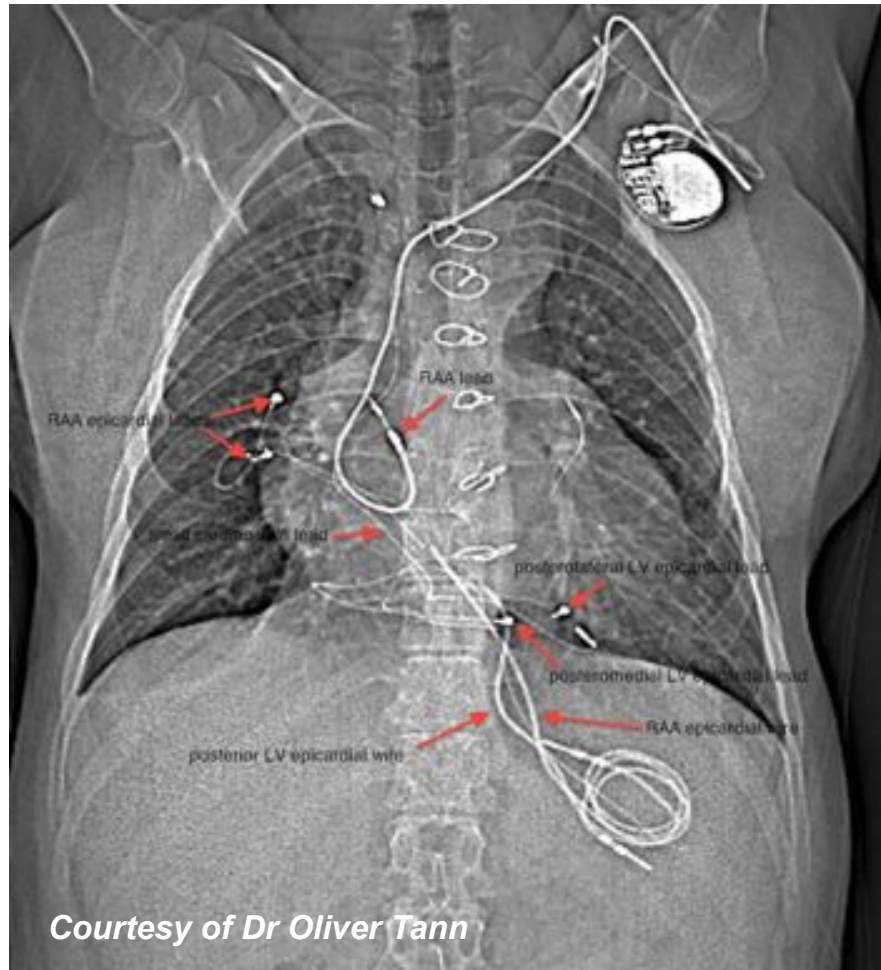
Maternal Outcome in Women with an Implantable Cardioverter Defibrillator (ICD)

UCLH NHS Trust

P. Schuler, R. Brooks, A. Herrey, R. Prieto, F. Walker



Maternal heart disease complexity is increasing



Increased adult survivors with

- congenital heart disease
- inherited/acquired cardiomyopathies
- inherited/acquired arrhythmias



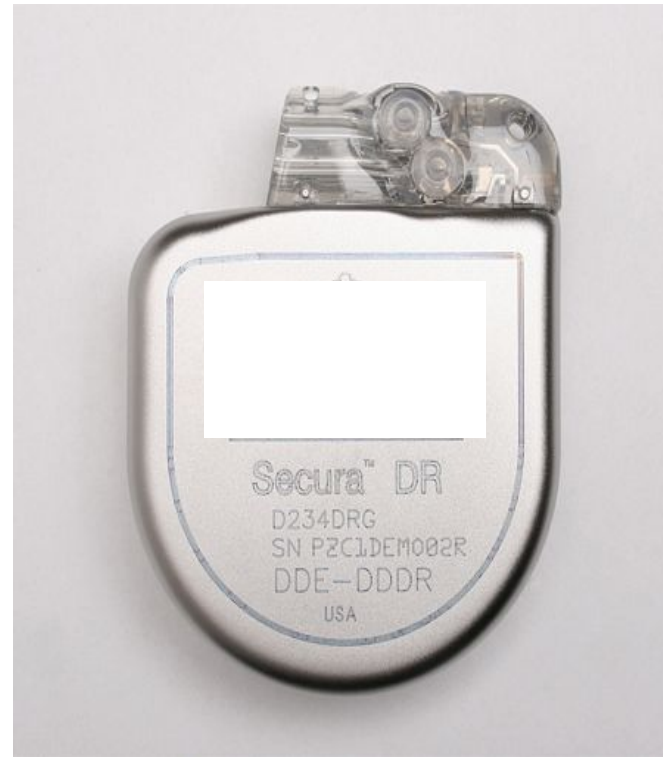
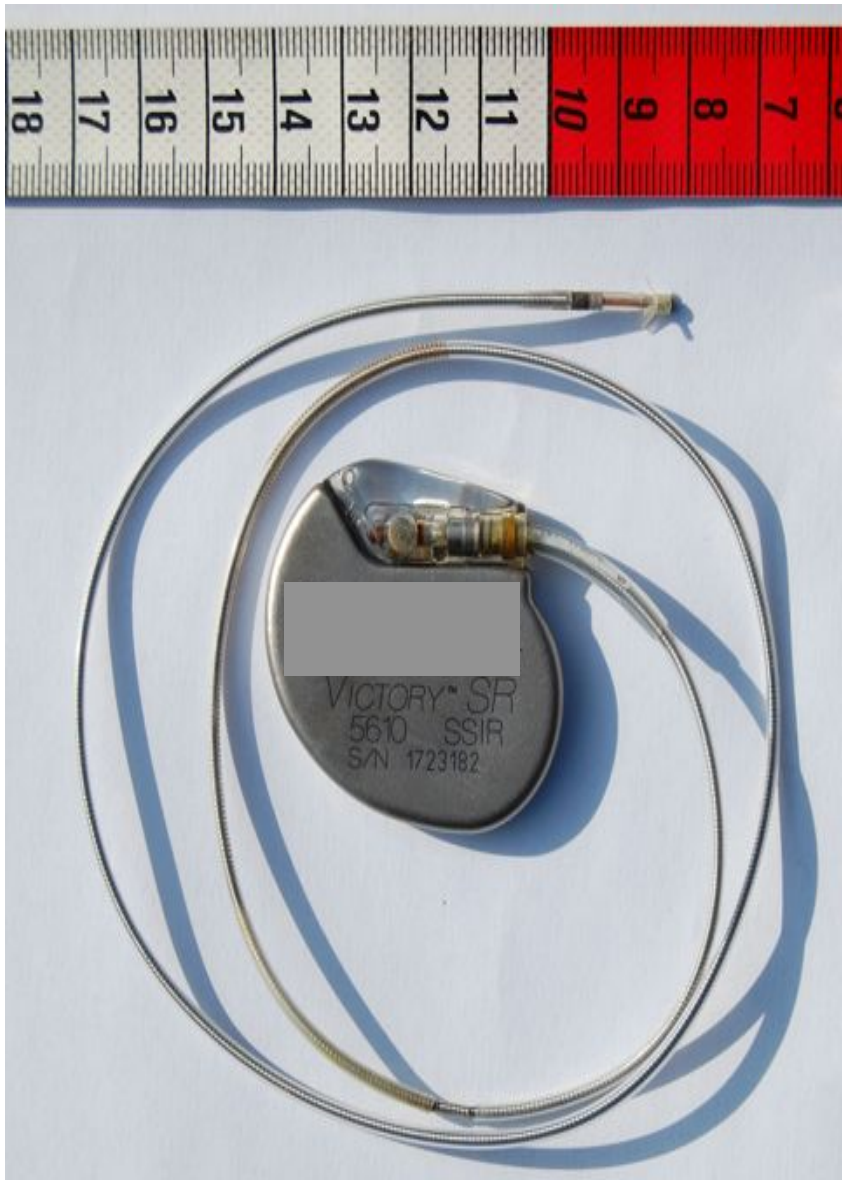
Malignant arrhythmias more common



Device management of arrhythmias more common

„Hymanotor“, Siemens-Halske company, defibrillator

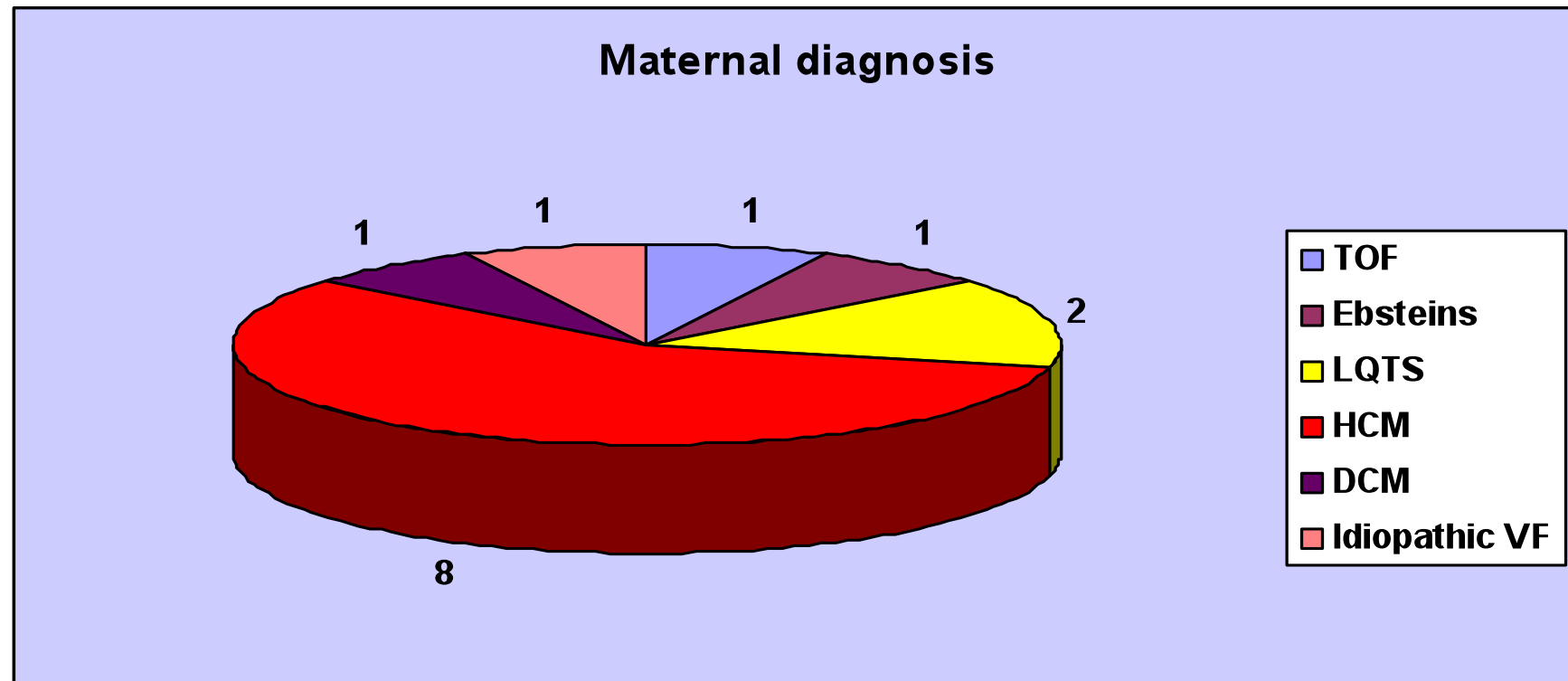




University College London Hospitals (UCLH) experience

Total number completed pregnancies n = 481

18 pregnancies in 14 women with ICD



ICD and pregnancy – UCLH experience

Mean age at conception 33 yrs (range 22-42)

LV systolic function: 11 normal
 3 moderate impairment (LVEF < 45%)

Con-comitant medications: Betablocker 8
 Diuretic 4
 Aspirin 4
 LMWH 2

Indication for ICD implant

Primary prevention n= 9
 syncope n= 4
 family history SCD n= 4
 nsVT n= 1
Secondary prevention n= 5
 cardiac arrest n= 2
 sustained VT n= 3

Transvenous endocardial n= 13
Epicardial (abdominal) n=1

Mode of Delivery

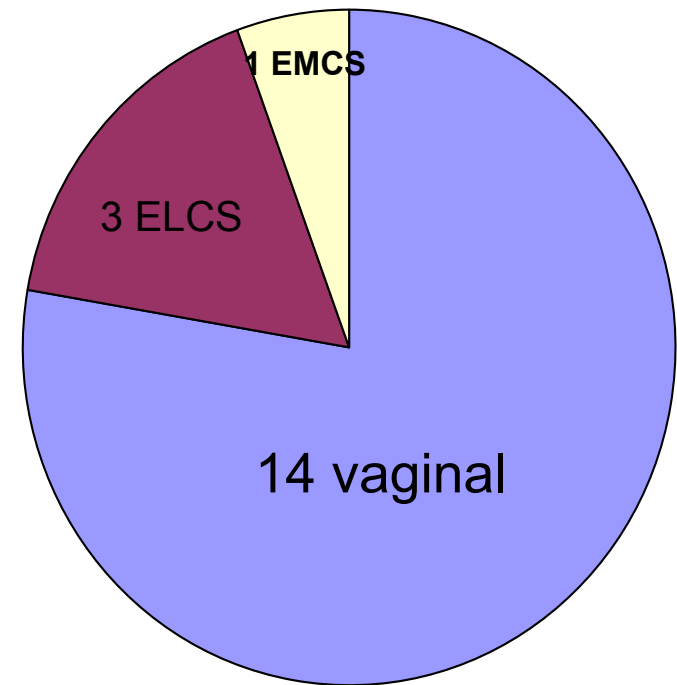
Mean gestational age at delivery
Mean birth weight

37.8 (range 32-41 weeks)
2.81 kg (range 1.6-3.6 kg)

14 Vaginal deliveries

4 Caesarean section

3 elective
1 emergency: failure to progress in labour



ICD programming and delivery

Vaginal delivery

ICD ON

Magnet available to inactivate if inappropriate device therapy

Caesarean delivery

ICD programmed prior to 'MONITOR ONLY' mode

Re-programmed ON immediately post-CS + ICD interrogation

Maternal cardiac events during pregnancy

Death		0
Heart failure		1
Shock		1
Thromboembolism	1	

Arrhythmia / Device therapy during pregnancy

nsVT	1		No device therapy
VF	1		Appropriate shock
SVT		1	Device recognition
Ectopy	2		Device recognition

ICD device

Transvenous endocardial	n= 13
Epicardial (abdominal)	n=1

Therapy delivered during pregnancy – DC shock

Appropriate	1
Inappropriate	0

Device complications

Thrombus	1
Lead fracture	1

Appropriate Device shock (1)

28 yrs old - Long QTS

Non-compliant with Bisoprolol 2.5 mgs od

VF at 20/40 – 31J shock → Sinus rhythm restored

Restarted beta-blocker

Delivered healthy infant 37 weeks - birth weight 2.7 kg

Second pregnancy on betablockers – Uneventful

ICD Lead thrombus (1)

39 yrs Hypertrophic cardiomyopathy (HCM)

No LVOT obstruction, Good LVEF

ICD implant 2005 – primary prevention (FHx SCD)

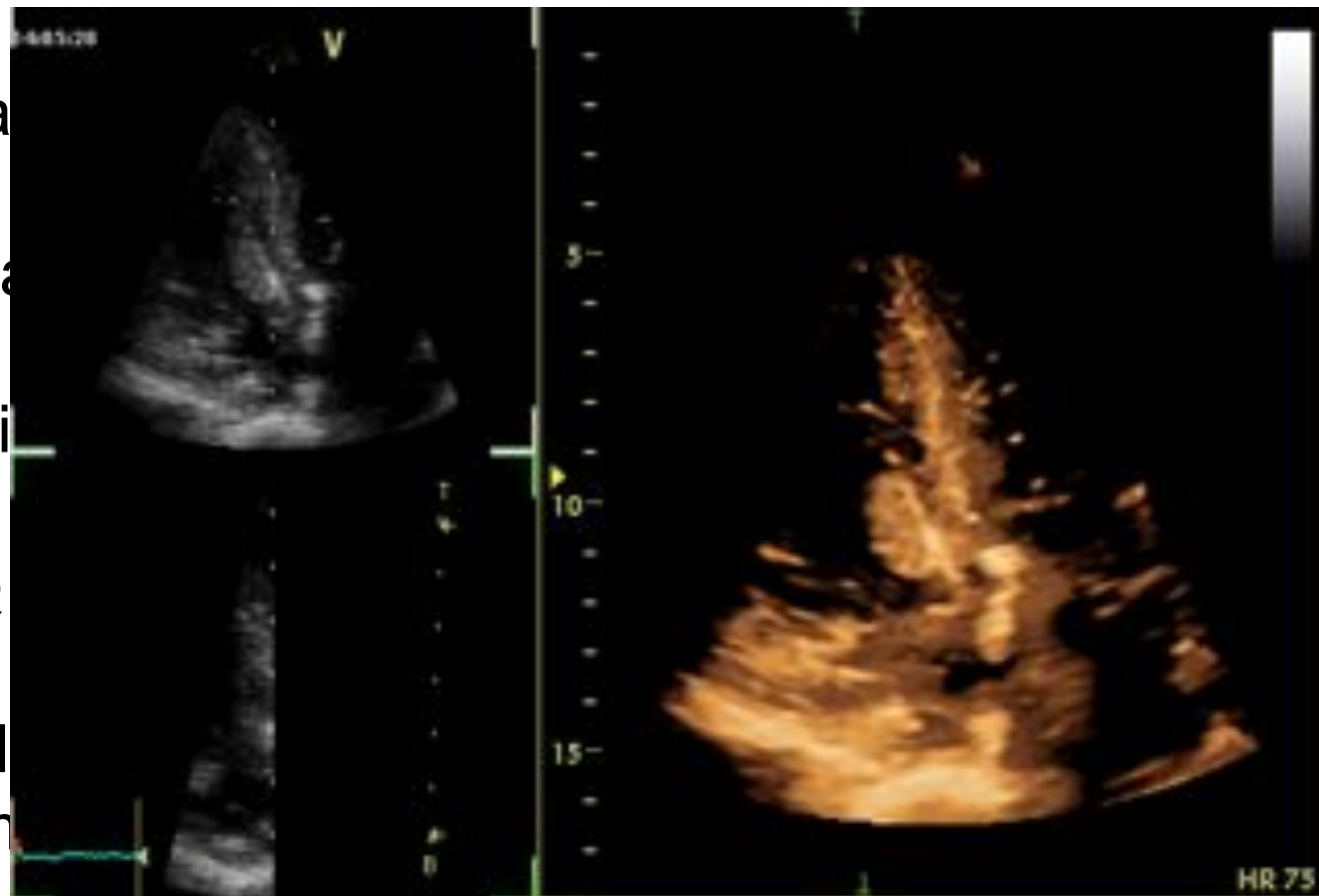
Previous pregnancy

Well, asymptomatic

Medication: Aspirin

Routine TTE @

– Thrombus on ICD lead
13x15mm



ICD Lead thrombus

Admitted

CXR & lung perfusion scan: no evidence of emboli

Therapeutic LMWH – Dalteparin 8500 U sc bd

Thrombophilia screen
(Sister pulmonary embolism)

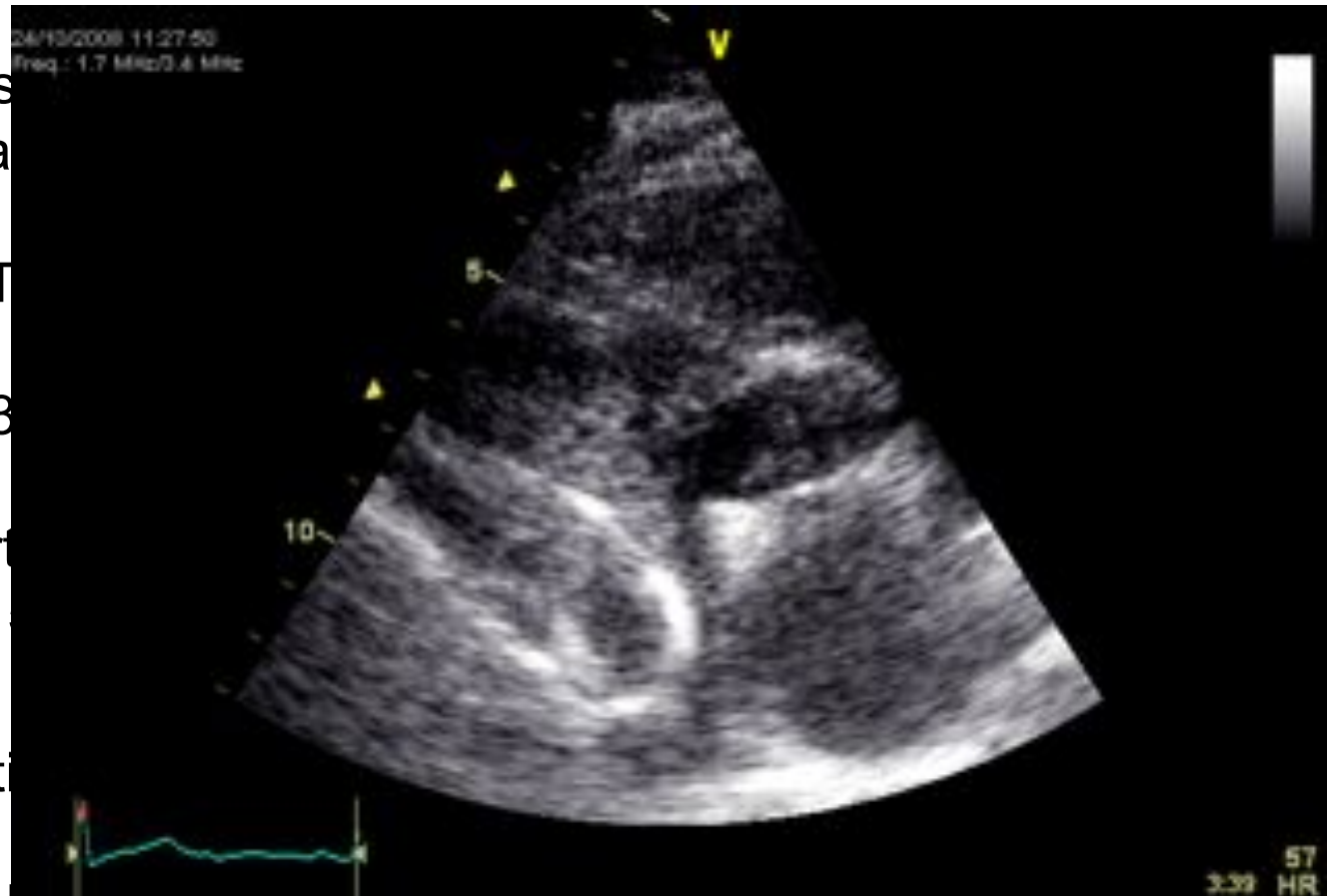
Weekly TTE – T

Elective CS at 3

7 days post part
TTE Thrombus

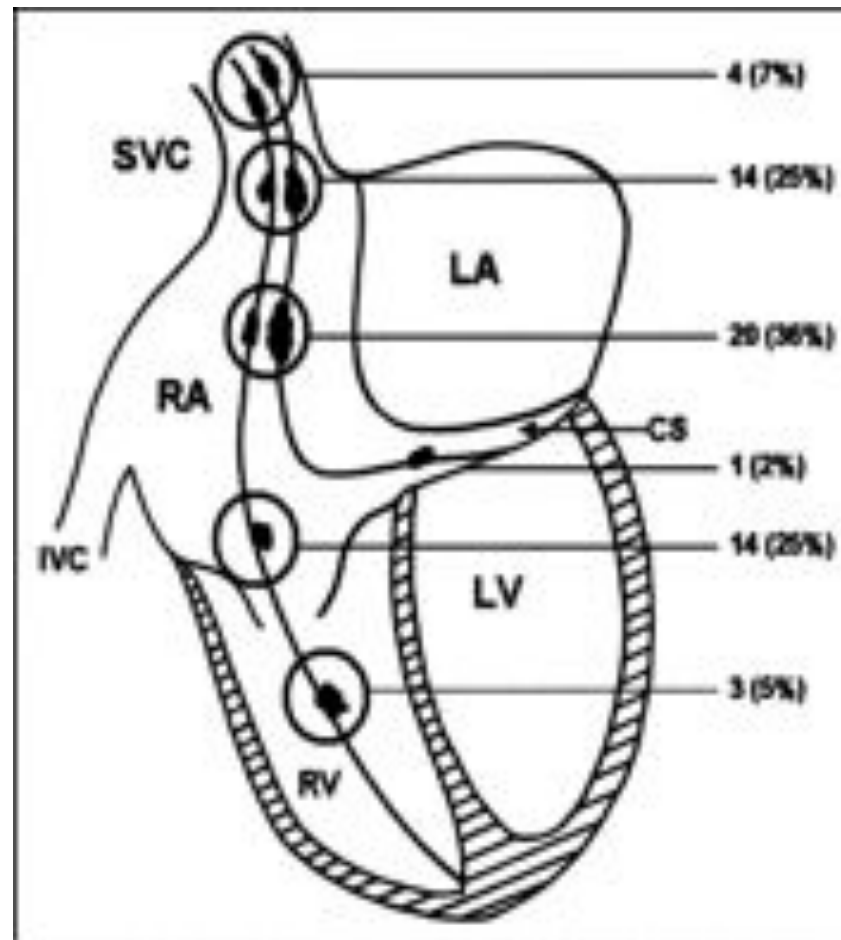
Surgical extraction

Uncomplicated Post-op recovery



Prevalence and Significance of Lead-Related Thrombi in Patients With Implantable Cardioverter Defibrillators

Benjamin J.W. Chow, MD, Ali H. Hassan, MD, Kwan L. Chan, MD, and Anthony S.L. Tang, MD



The American Journal of Cardiology Vol. 91 January 1, 2003

Increased thrombotic risk

- Obesity BMI > 30
- Past history of VTE
- Family history of VTE
- Age > 35 yrs (risk doubles)
- Inherited / acquired thrombophilia

Cardiac conditions:

- Atrial arrhythmias
- Cyanosis
- Mechanical valves
- Fontan circulation
- Mitral / tricuspid stenosis
- Poor systemic ventricular function
- LV non compaction

→ Anticoagulation

Atrial lead fracture

29 years old

HCM & Ross operation for AR

ICD for NSVT (2003) + FHx SCD



Medications: Dalteparin 5000 U sc bd (Dysrhythmias, enlarged LA)
Propranolol 40 mg od

c/o Frequent Palpitations at 2nd trimester

ICD interrogation: Sinus tachycardia

Propranolol 40mg bd

A-lead impedance > 3000 ohms

Device re-programmed to VVI

→ VT detection zone HR increased

CS at 32 weeks

Healthy infant BWT 1.6 Kg

Heart failure

42 years – HCM with poor LV EF 40%

ICD implant – Previous cardiac arrest,
Surgical complete heart block (myectomy)
NYHA II

Clinical signs of heart failure at 2nd trimester

Medications: Bumetanide 1mg

Induction of labor and normal vaginal delivery at 36 weeks

Healthy infant birth weight 3kg

No peri- or post-partum complications

In Conclusion

1. ICD shocks were uncommon during pregnancy
2. Patients need close surveillance & low threshold for device interrogation if palpitations
3. Arrhythmias require prompt treatment to prevent inappropriate device therapies / cardiac decompensation
4. Assess TE risk & consider thrombophilia screening in those with a prior or family history of venous thrombosis

