

CASE HISTORY 3

ADVANCED PACEMAKER TREATMENT

HEART FAILURE

Heart failure is a syndrome – a collection of symptoms and abnormal findings that describes the situation of the failing heart. There are multiple underlying causes.

The heart sends blood through the circulation to all the vital organs. The bloodstream carries nutrients, oxygen, water, chemical messengers (hormones), heat and white blood cells to fight infection.

In heart failure the volume of blood pumped per minute at rest or in response to exercise falls and this may be associated with salt and water retention resulting in fluid overload.

DILATED CARDIOMYOPATHY

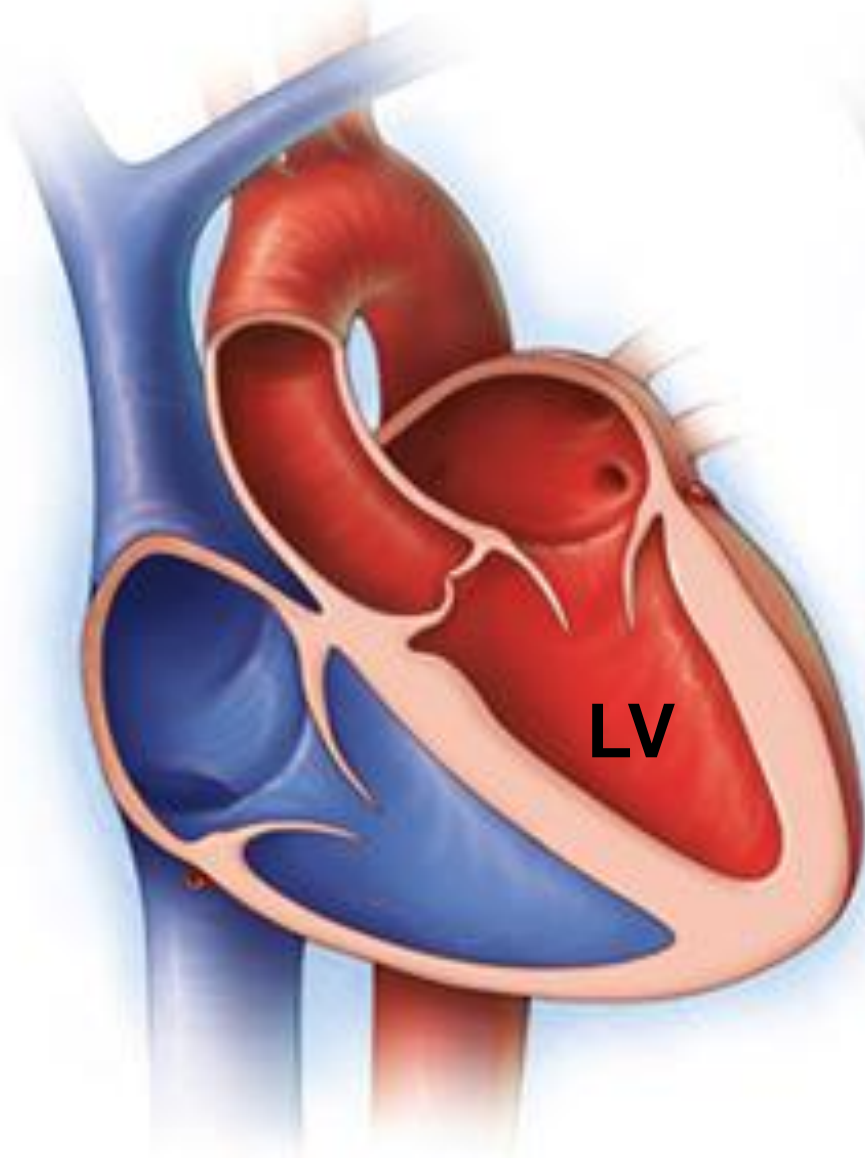
A 76 year old lady had been diagnosed with dilated cardiomyopathy (DCM) 15 years earlier. DCM can be acquired in life, possibly triggered by a virus, and it is inherited in one third of affected individuals. The result is global weakness of the pumping chamber, which results in fatigue and breathlessness. The impact can be mild or debilitating.

The lady had experienced progressive deterioration such that she was breathless on mild exercise and was waking up at night with breathlessness. Also she had been admitted to hospital on 3 occasions in the last 3 months. Her echocardiogram or heart ultrasound showed an ejection fraction or pumping power of 20%, which is a 1/3 of normal.

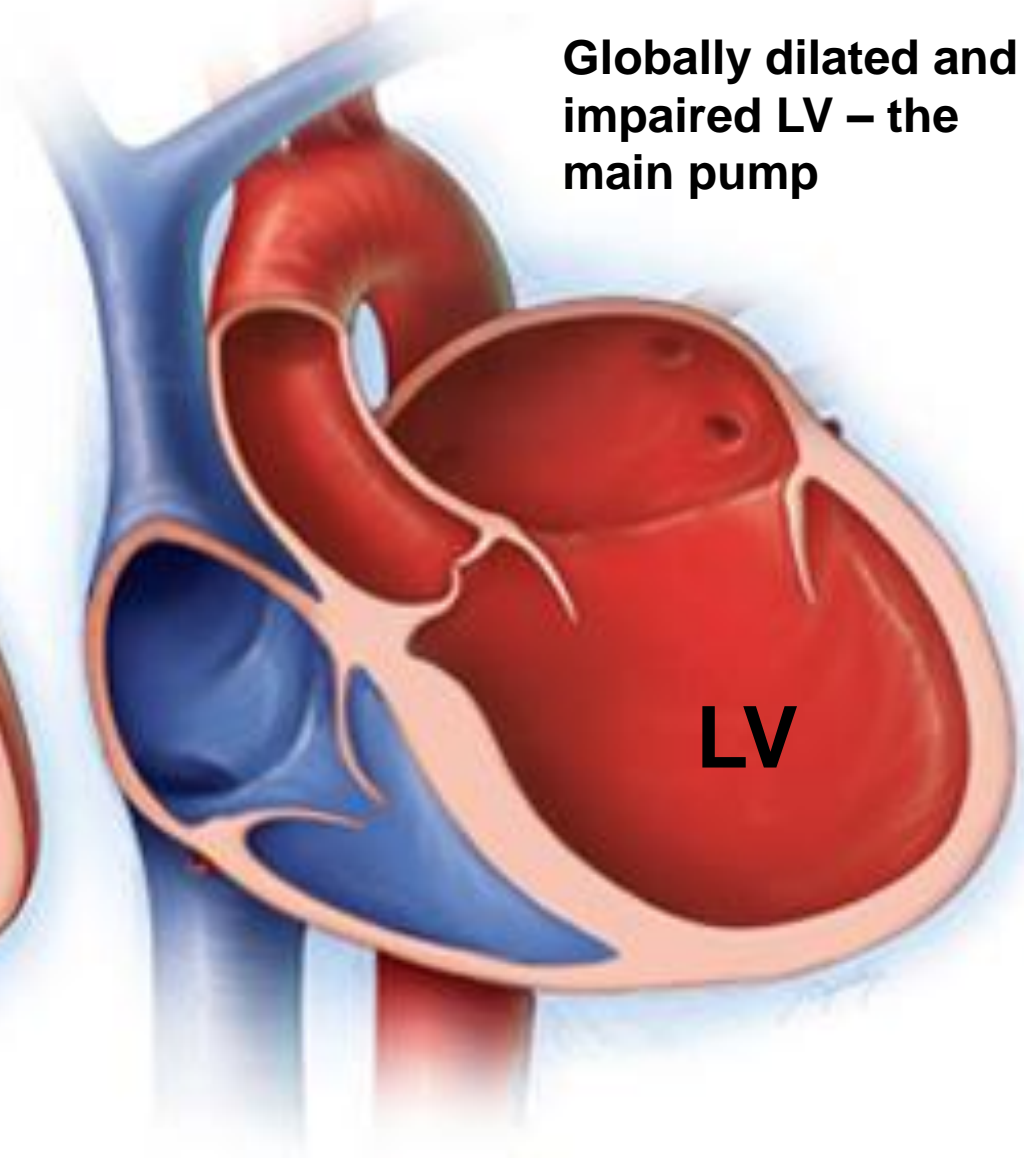
Her quality of life was poor and she was at high risk of death from a sudden rhythm disturbance or worsening heart failure.

Her medication included water tablets (diuretics), and medication to improve the pumping power of her heart – a beta blocker and an Ace inhibitor

Normal heart



Dilated cardiomyopathy



Globally dilated and impaired LV – the main pump

LV

LV

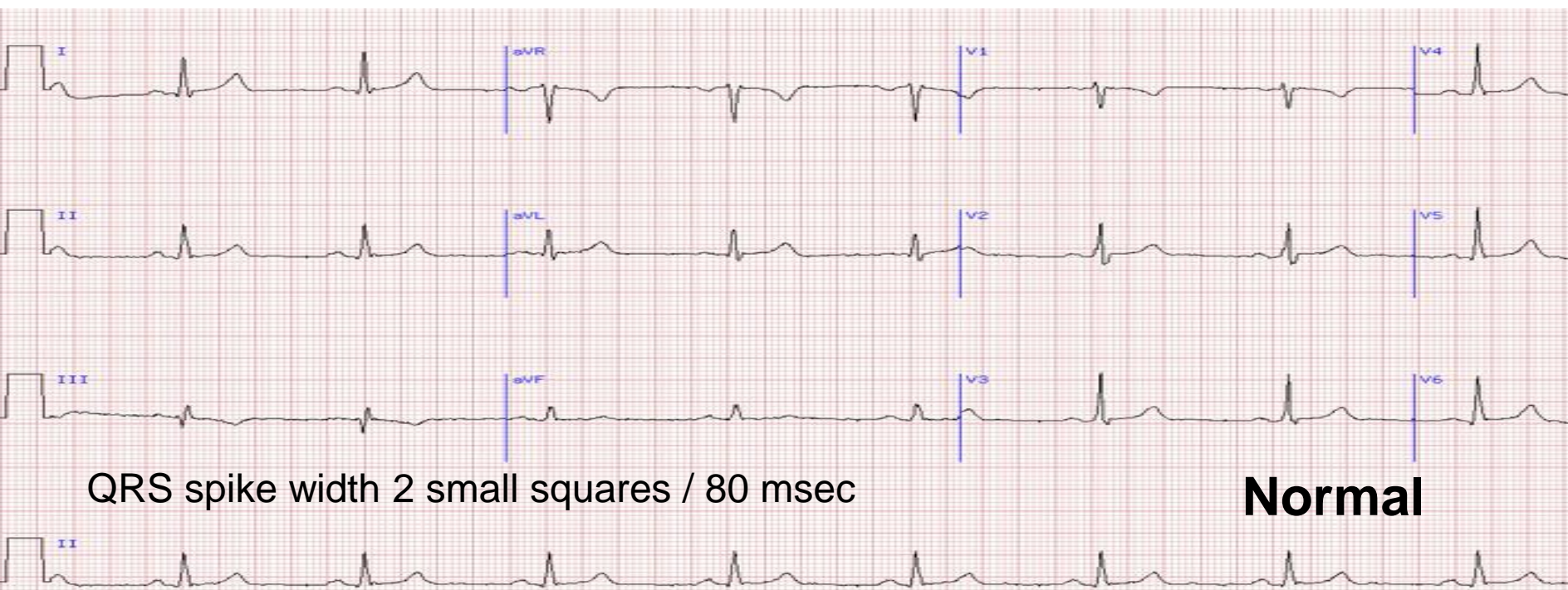
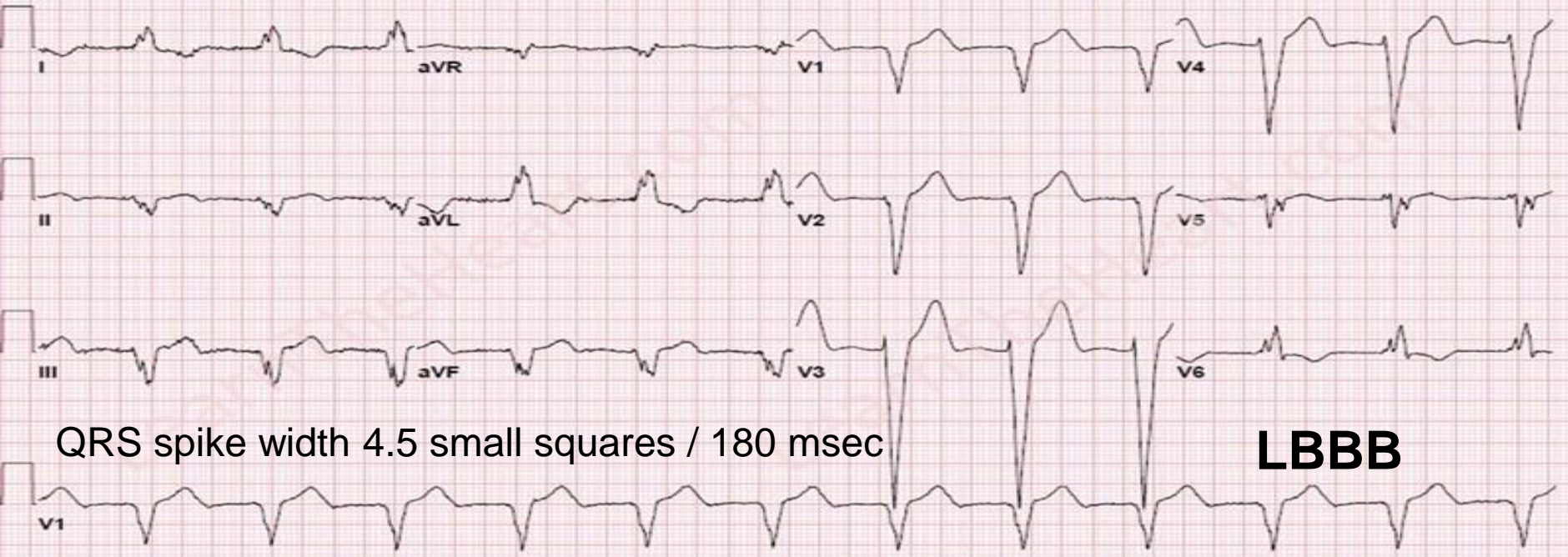
CARDIAC RESYNCHRONISATION THEREAPY (CRT)

Cardiac resynchronisation therapy is a powerful technique that can transform heart muscle function, and so stabilize or significantly recover the function of the failing heart. CRT corrects disorganized electrics (electrical dyssynchrony) and so corrects mechanical dyssynchrony.

The patient was referred to Dr Clarke by one of the heart failure nurses for consideration of a specialized pacemaker or CRT-P implant.

Examination revealed a resting heart rate of 84 bpm, a blood pressure of 110/70 and features of an enlarged heart.

The ECG showed an electrical conduction abnormality called left bundle branch block (LBBB), with widening of the QRS spike on the ECG to 180 msec, (normal is up to 100 msec)

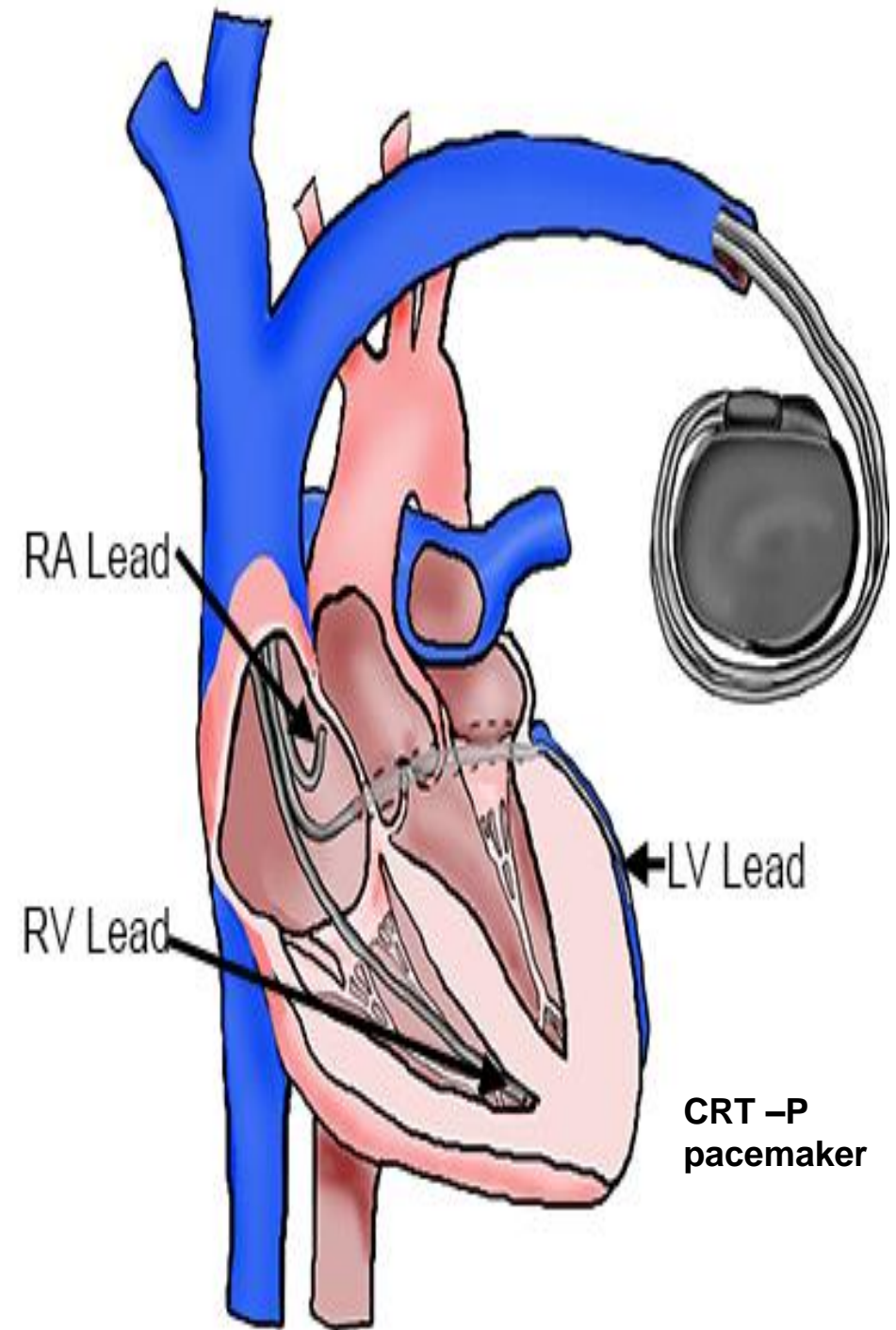


MANAGEMENT

Her medication was optimised by addition of spironolactone , a diuretic which improves quality of life and survival. Also her heart rate was slowed with ivabradine which specifically slows the intrinsic pacemaker cells and increases pumping power.

Because she had poor pump function at 20% combined with LBBB which causes the left ventricle to contract late and out of step with the right heart she was a candidate for cardiac resynchronisation therapy which corrects the time delay of left heart contraction and so improves pumping function. She was also a candidate for a defibrillator to reduce sudden death. Both functions are combined in a biventricular defibrillator or CRT-D.

Three pacemaker leads are placed by the left arm vein, two in the right heart and one on the outside of the left heart which is accessed via a vein draining into the right atrium



PROGRESS

In the first month her exercise capacity significantly improved. At 3 months she was asymptomatic and at 5 months the pumping power had greatly increased to 50%