

MEDICAL GRAND ROUNDS

Parkland Memorial Hospital  
February 14, 1963

Complete A-V Block

CASE #1: [REDACTED]

This 34-year-old [REDACTED] male was admitted with a history of "passing out" the morning of admission. This episode occurred without any warning, and lasted three minutes. There was no loss of bladder control and no tonic or clonic convulsions. Thirteen years ago (age 21), he was rejected from the Army because "his heart was slow". The patient was completely asymptomatic up to 8 years ago (age 26), when he fainted for the first time and sprained his ankle. He was again asymptomatic until admission.

The patient denied chest pain or history suggestive of diphtheria, rheumatic fever, scarlet fever or syphilis.

On admission, his blood pressure was 126/84, pulse 40 and regular. The lungs were clear. The heart was slightly enlarged; a grade 1-2 basal ejection systolic murmur was heard. Aortic second sound was present. The rest of the physical examination was non-contributory.

Pertinent laboratory findings were hemoglobin 13.2 gm.%, BUN 12 mg.%, and serum K<sup>+</sup> 4.2 mEq/L.

CASE #2: [REDACTED]

This 59-year-old man began experiencing episodes of weakness and dizziness in 1957. In [REDACTED] 1960, these attacks recurred and on a few occasions he lost consciousness. In [REDACTED] 1961, the patient had 26 fainting spells in a two-week period and four severe attacks characterized by loss of consciousness, convulsions, and no loss of sphincteric control. These attacks lasted two minutes each. In [REDACTED] 1961, his blood pressure was 140/40, he had a grade 2 aortic systolic ejection murmur, and prominent A2. Atrial sounds were heard over the precordium. Electrocardiogram revealed a complete heart block (ventricular rate 30/min., atrial rate 108/min.). On Isuprel 20 mg. 4-6 times a day, his pulse rate increased with marked clinical improvement. The rhythm in the ECG changed to primary A-V block.

In [REDACTED] 1962, he complained of shortness of breath, orthopnea, PND, and gained 30 lbs. of weight. His pulse had dropped to 25/min., the BUN rose to 61 mg.% and serum K<sup>+</sup> to 6.1 mEq/L. He was treated with Diuril, Isuprel and Kayoxalate with marked improvement, both clinically and by ECG. The serum K<sup>+</sup> gradually dropped to 3.1-3.3 mEq/L.

Two months later, he experienced severe chest pain and developed acute posterior myocardial infarction. His rhythm returned to complete A-V block and was resistant to a decrease in serum K<sup>+</sup> level.

On admission, his blood pressure was 160/70, pulse 40 and regular and 40/min. There was a marked arcus aortae and mild xanthomas. The lungs were clear. The heart

CASE #3: [REDACTED]

This 64-year-old [REDACTED] was admitted to the medical service on [REDACTED]/61 with a history of slow pulse since 1959. In [REDACTED] 1959, an electrocardiogram revealed sinus rhythm, right bundle branch block and ventricular rate of 69/min. On [REDACTED] 60, another tracing revealed a complete heart block. The ventricular rate was 30/min. and the atrial rate was 110/min. On ephedrine 100 mg. daily and Isuprel intermittently, he experienced one episode of Adams-Stokes attack in [REDACTED] 1961. On [REDACTED] and [REDACTED], 1961, he developed several episodes of fainting spells. An electrocardiogram was obtained on March 14 which revealed a second-degree heart block.

For three weeks prior to admission, he experienced several episodes of fainting spells and for two to three days prior to admission, two attacks of Adams-Stokes. On both occasions, his heart beats returned following thumping of the chest by his wife, who was standing constantly near his bed. Between these episodes his pulse rate was about 20/min. The patient denied chest pain and gave no history suggestive of myocardial infarction.

The pertinent physical findings on admission were: Blood pressure 126/70, irregular pulse 40/min., no arcus senilis. The heart was slightly enlarged with a variable first heart sound; occasionally an auricular sound was heard. A systolic ejection murmur was heard over the aortic area. The peripheral pulses were equal bilaterally.

Admission electrocardiogram revealed the complete heart block and ventricular rate of 30/min. The ventricular complexes were coming from two foci. A blood cholesterol of 150 mg.% and serum uric acid of 7.1-8.8 mg.% were noted. On [REDACTED]/61, a transistorized intracardiac pacemaker was implanted. The cardiac electrodes were placed to the left of the anterior descending coronary artery. Following surgery, his heart rate varied between 56-60/min. This resulted in his return to daily active work. In [REDACTED] 1962, his granddaughter kicked him in the left abdominal region, over the pacemaker's pocket. As a result, one of the electrodes broke loose and he fainted. To keep his pulse rate around 60/min., he learned to hold up his lower abdomen. The pacemaker was replaced a few days later with return of the ventricular rate to 60/min.

CASE #4: [REDACTED]

This 74-year-old retired businessman was referred to the medical service on [REDACTED]/61 with a one-year history of Stokes-Adams attacks. In [REDACTED] 1959 and again in [REDACTED] 1960, he was in a car accident. He could not recall the details of these accidents. In [REDACTED] 1960, he fell down, developing an attack of Stokes-Adams, and fractured his left ankle. For a month prior to this episode, he had frequent episodes of dizzy spells; these numbered as many as 7 per day. These spells disappeared temporarily on Isuprel, steroid therapy and Coumadin, but recurred three months prior to admission. A typical attack is heralded with haziness of his vision. Subsequently, the patient loses his balance and falls. The fall is followed by rigors. At no time does he lose sphincteric control. The attack lasts 10-15 sec. The patient denied anginal pain.

On admission, his blood pressure was 160/70, his pulse was regular and 40/min. There was a marked arcus senilis and palmar erythema. The lungs were clear. The heart

was enlarged; atrial sounds were prominent over the precordium, but no significant murmur was heard. The peripheral pulses were water-hammer like and were equal bilaterally.

The electrocardiogram revealed complete heart block, ventricular rate 28/min. and atrial rate 60/min.

On [REDACTED]/61, a transistorized intracardiac pacemaker was implanted. The cardiac electrodes were inserted to the left of the anterior descending artery. On the third post-operative day the patient developed a sinus rhythm with right bundle branch block with the pacemaker giving rise to a ventricular premature beat. This dual rhythm lasted for 3 months and finally the only remaining impulse was from the implanted pacemaker.

Eighteen months after the pacemaker was implanted, the rate was still 56-60/min. The patient was actively doing his daily work.

CASE #5: [REDACTED]

This 52-year-old [REDACTED] was admitted to the medical service on [REDACTED]/62 for evaluation of his slow pulse. In 1958, he felt "run down" and consulted a physician, who found a slow pulse (38-42/min.). An electrocardiogram taken at that time demonstrated a complete heart block. He was given no medication. The patient denied dyspnea, orthopnea or chest pain. In [REDACTED] 1962, he blacked out and fell down, injuring his head. He was unconscious for a few minutes.

Physical examination revealed an obese man in no distress. The blood pressure was 128/70. The pulse was regular, 28/min., with variable intensity of the first heart sound. A prominent ejection murmur was heard at the base; atrial sounds were present over the precordium. The aortic second sound was present. The rest of his physical exam was non-contributory.

The pertinent laboratory findings were hemoglobin 16.7 gm.%, hematocrit 53%, BUN 15 mg.%, uric acid 12.0 mg.%, platelet count 126,000, serum  $K^+$  4.2-4.7 mEq/L. The ECG revealed a complete heart block.

Following admission, his serum  $K^+$  was lowered to 3.5 mEq/L., which resulted in an increase in the ventricular rate to 42/min. In spite of continued therapy, his pulse rate dropped to 28-30/min.

On [REDACTED] 1962, a transistorized intracardiac pacemaker was implanted. Prior to surgery, a #5 electrode catheter was introduced into the right ventricle via the external jugular vein and its outside pole was connected to an external pacemaker. During induction of anesthesia, the heart stopped. A continuous pacing of the heart was made available by the already existing external pacemaker. After surgery, the electrode catheter was removed.

At present his pulse rate is 60-65/min. The intensity of the basal murmur has markedly decreased. Subsequently he developed gouty arthritis which necessitated therapy.

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The patient was a 44-year-old male who had been in good health until the onset of chest pain. He was admitted to the hospital on 8/10/62. The chest pain was described as a crushing pain in the substernal area, radiating to the left arm and back. The pain was associated with nausea and vomiting. The patient was in severe distress and required oxygen. The physical examination was remarkable for tachycardia and a third heart sound. The chest x-ray was normal. The electrocardiogram showed a sinus tachycardia with a heart rate of 140 beats per minute. The patient was treated with morphine and oxygen. The pain subsided, but the tachycardia persisted. The patient was then treated with digitalis. The tachycardia resolved, but the patient developed a new complaint of shortness of breath. The patient was then treated with furosemide. The shortness of breath resolved. The patient was discharged on 8/11/62. The patient was followed up in the outpatient clinic. The patient was well at the time of the last follow-up visit on 8/15/62.

Admission laboratory studies: Hemoglobin 15.1 g/dl, Hematocrit 44%, WBC 8,350, Poly 34%, Lymph 10%, Monocyte 3%, Eosinophil 2%, Platelets 125,000, Reticulocyte 1.0%. The patient was also given a 12-lead ECG which showed a sinus tachycardia with a heart rate of 140 beats per minute. The patient was also given a chest x-ray which was normal. The patient was discharged on 8/11/62. The patient was followed up in the outpatient clinic. The patient was well at the time of the last follow-up visit on 8/15/62.

#### Laboratory studies:

	8/10	8/11	8/12	8/13	8/14	8/15
Hemoglobin	15.1	15.0	15.0	15.0	15.0	15.0
Hematocrit	44	43	42	40	38.5	37
Sed rate	12	11	10	10	10	10
WBC	8,350	8,900	9,000	9,000	8,400	4,600
Poly	34%	41%	80%	70%	70%	50%
Lymph	10%	25%	18%	20%	30%	30%
Monocyte	3%	3%	1%	1%	1%	1%
Eosinophil	2%	30%	1%	1%	1%	1%
Platelets	125,000	125,000	125,000	125,000	125,000	125,000
Reticulocyte	1.0%	1.0%	0.5%	0.5%	0.5%	0.5%