

Ectopic beats - hidden signals

Clinical cases

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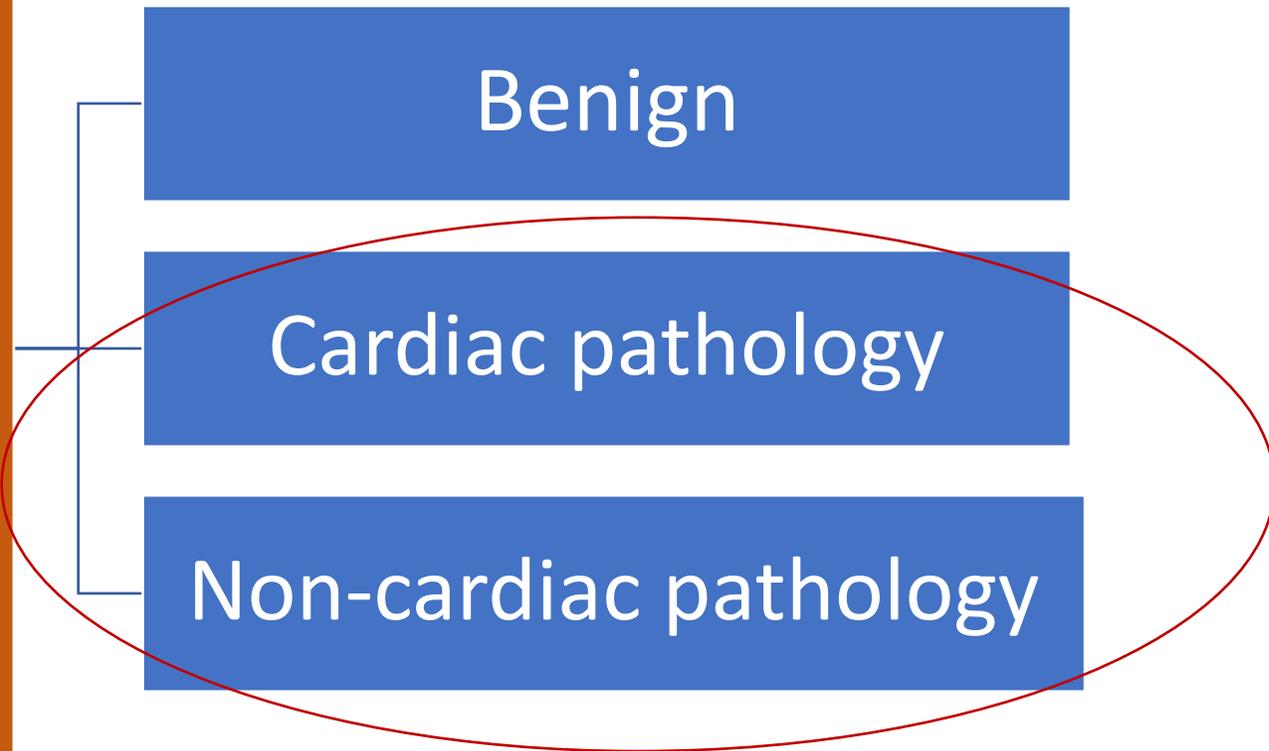
Ectopic complexes or extrasystoles

- The most common form of cardiac arrhythmia, very frequent
- Often benign condition, mostly if no evidence of structural, functional or coronary heart disease
- Could have an underlying heart disease or other, non cardiac pathology
- The stimulus for heart contraction is localized not in the sine-atrial node (atria, ventricles, AV junction).
- Clinically could be determined as irregular beats during auscultation and/or at the ECG recording

Ectopic complexes or extrasystoles

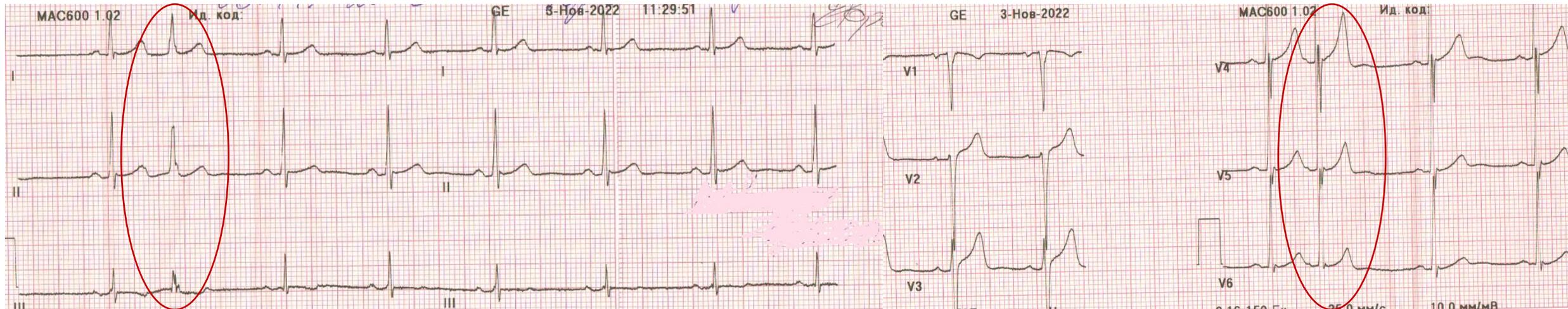
- Premature atrial and ventricular beats are considered benign and without long-term consequences in the absence of structural heart disease and with suppression of premature beats during exercise
- Could be related to non-pathological conditions like anxiety, digestive difficulties, stress, sleep deprivation and
- The lifestyle intervention could solve the problem – reduction of the most frequent triggering factors as caffeine, nicotine, drugs or excessive sports.
- Role of AME is to reassure that ectopic beat is benign and advise pilot to modify the lifestyle if that is the case

Extrasystoles



Case 1

- Initial applicant for class 2 medical certificate, male, 26 y.o.
- Clinical examination – mid systolic murmur,
- Rest ECG – rare premature ventricular & more frequent supra-ventricular ectopic beats



Case 1

- ECHO CG – prolapse of MV = 6mm (leaflet displacement of >5mm characteristic for minor-moderate degree), I-II dr. of MV regurgitation, normal cavities, EF -60%
- 24-h Holter – 0,6% PVB, **3% PSVB**



Case 1

- Fibro gastroscopic investigation – gastroesophageal reflux, erosive gastroduodenitis, Helicobacter pylori - positive
- Treatment of gastroduodenitis – SV premature beats have been reduced by 50 %, PVB disappeared

Aeromedical decision – FIT for flying duties Class 2

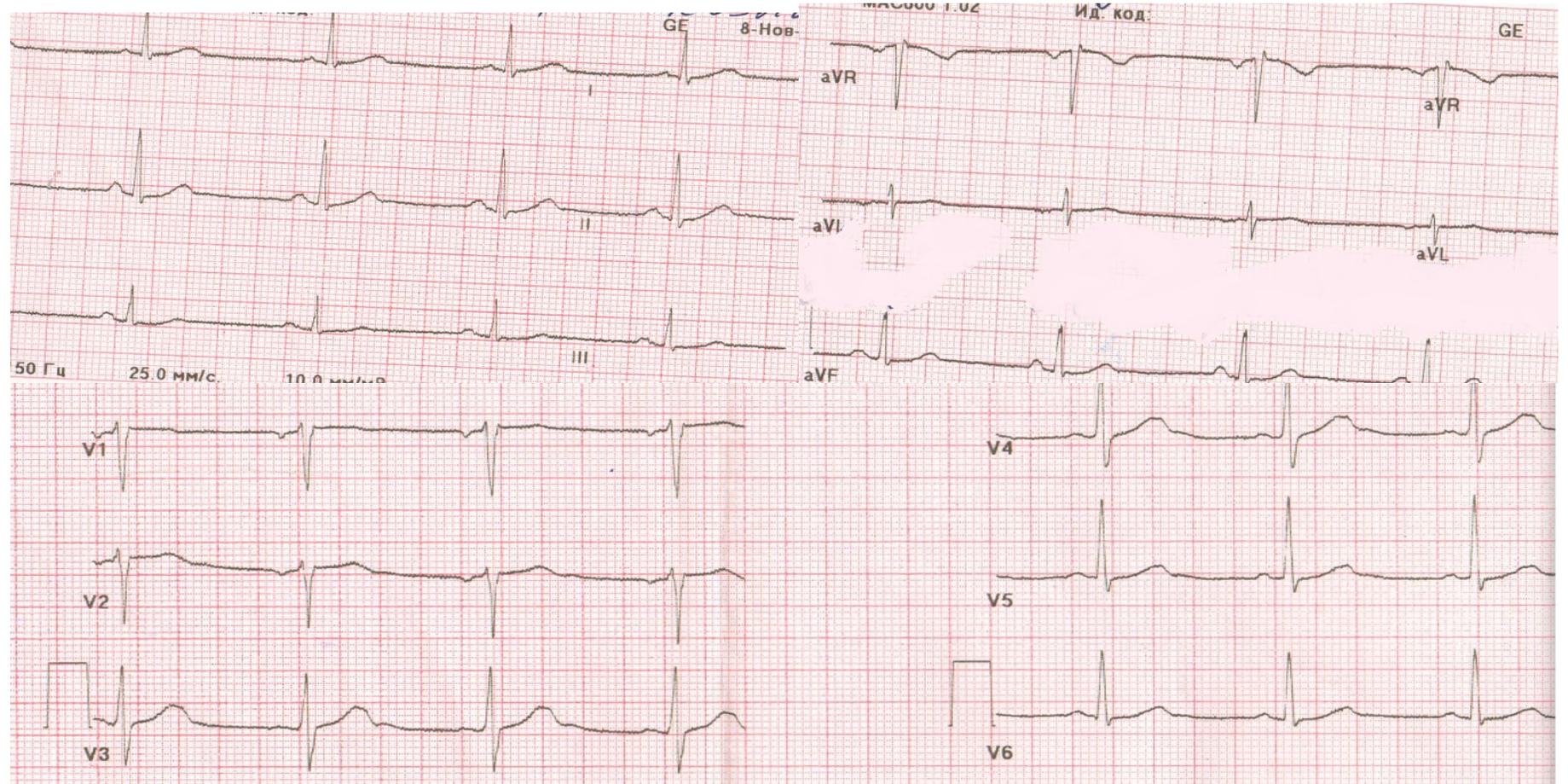
Case 2

- 54 y.o. ATPL pilot of B747, 14300 total flight hours
- Medical examination for revalidation of medical certificate Class 1:
 - Risk factors: age, male gender, dyslipidemia (total cholesterol – 6,72mmol/L, triglyceride – 2,13mmol/L), obesity (BMI – 30.02);)
- Normal BP
- Rest ECG - PSVB

Case 2

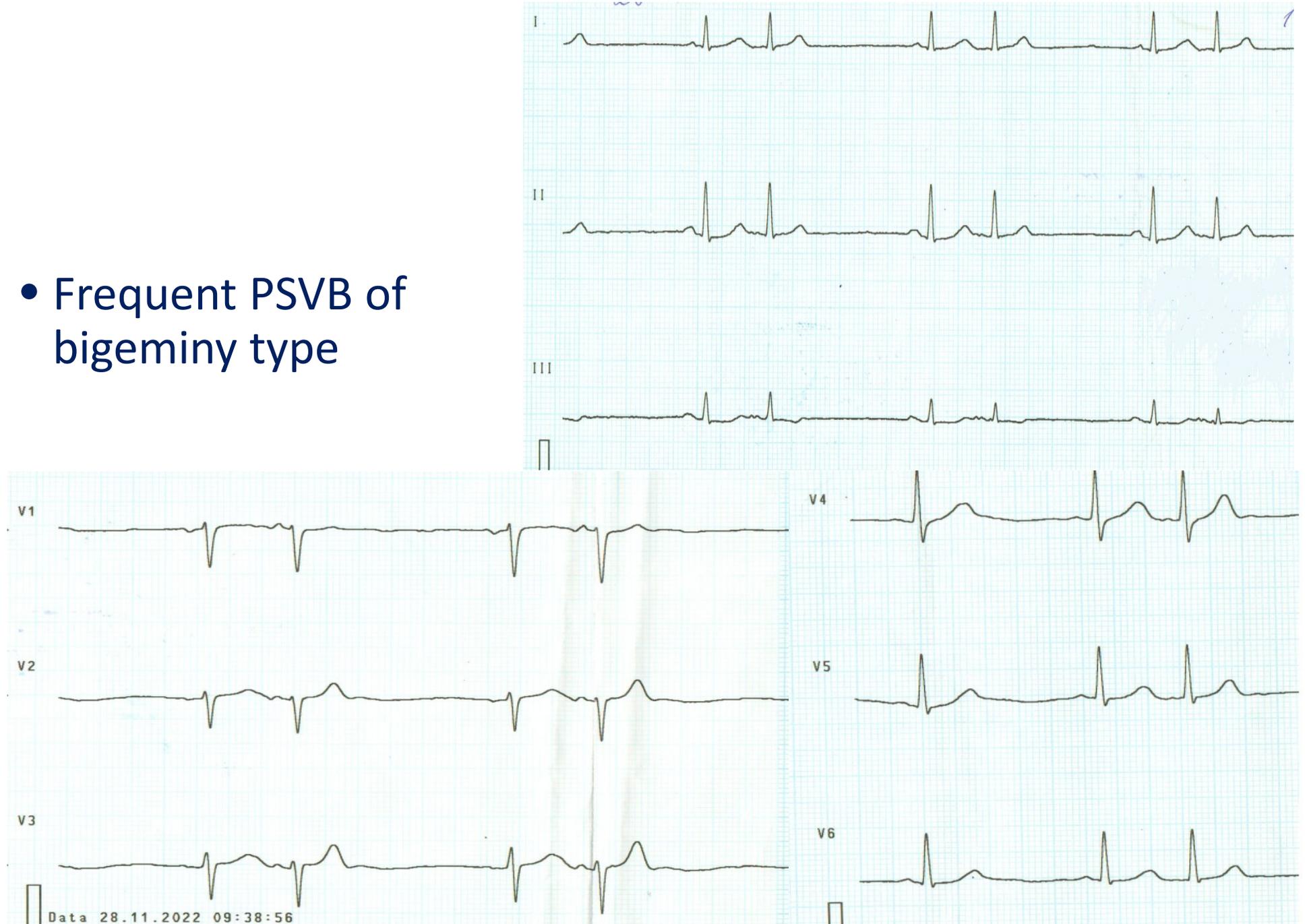
- Previous medical examination in 2021

- Normal ECG



Case 2

- 2022
- Frequent PSVB of bigeminy type



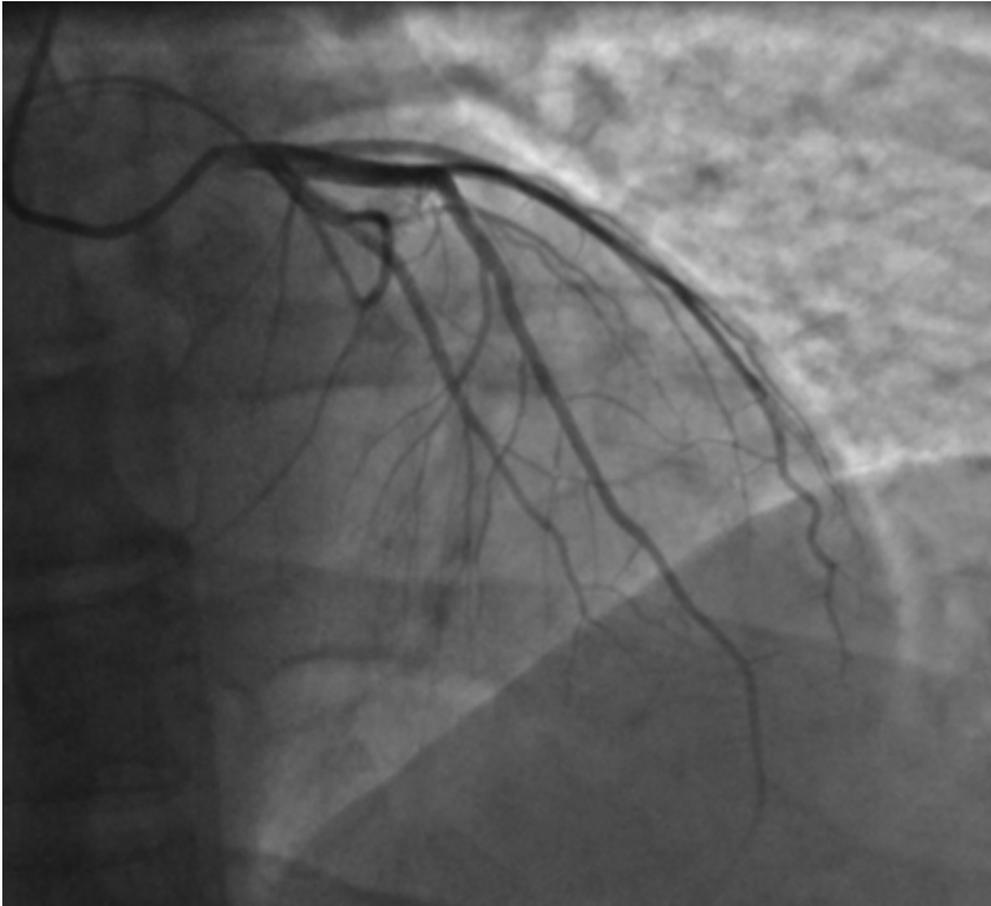
Case 2

- ECHO CG – no structural abnormality, EF – 60%
- Stress ECG – no signs of ischemia, high tolerance, PSVB remain recorded during the test.
- 24 hour Holter monitoring – 0,01% - PVB, **20% PSVB** representing bigeminy, trigeminy, quadrigeminy, couplets, triplets.



Case 2

- PTCI - non-modified coronaries, no stenosing lesions



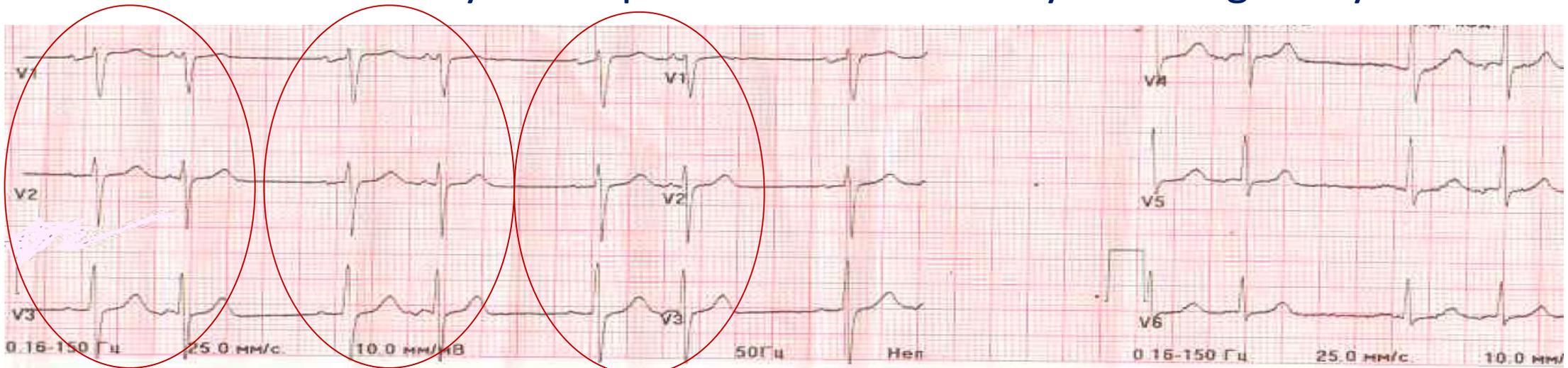
Case 2

- Ultrasound of abdomen – hepatic steatosis, gall polyp
- Fibro gastroscopic investigation – cicatricial duodenal bulb, *H pylori* - negative
- Pilot received medical advise from gastroenterologist and cardiologist

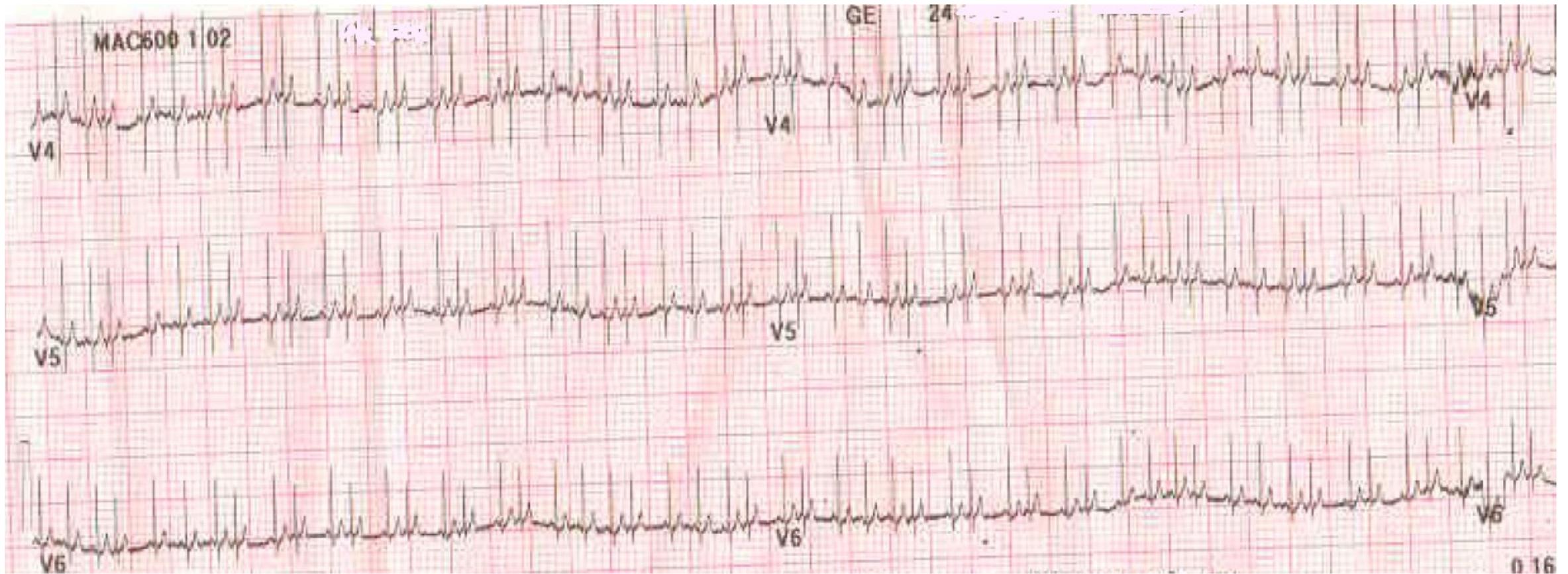
Aeromedical decision – FIT for flying duties Class 1 with OML limitation valid only as or with qualified co-pilot

Case 3

- 46 years old ATPL helicopter pilot, 5100 hours of flight flown
- Medical examination for revalidation of Class 1 medical certificate
- BMI – 31,5
- BP 120/75 mmHg
- HR 66 bpm
- Rest ECG – sinus rhythm supra ventricular extrasystoles bigeminy



Case 3 Rest ECG

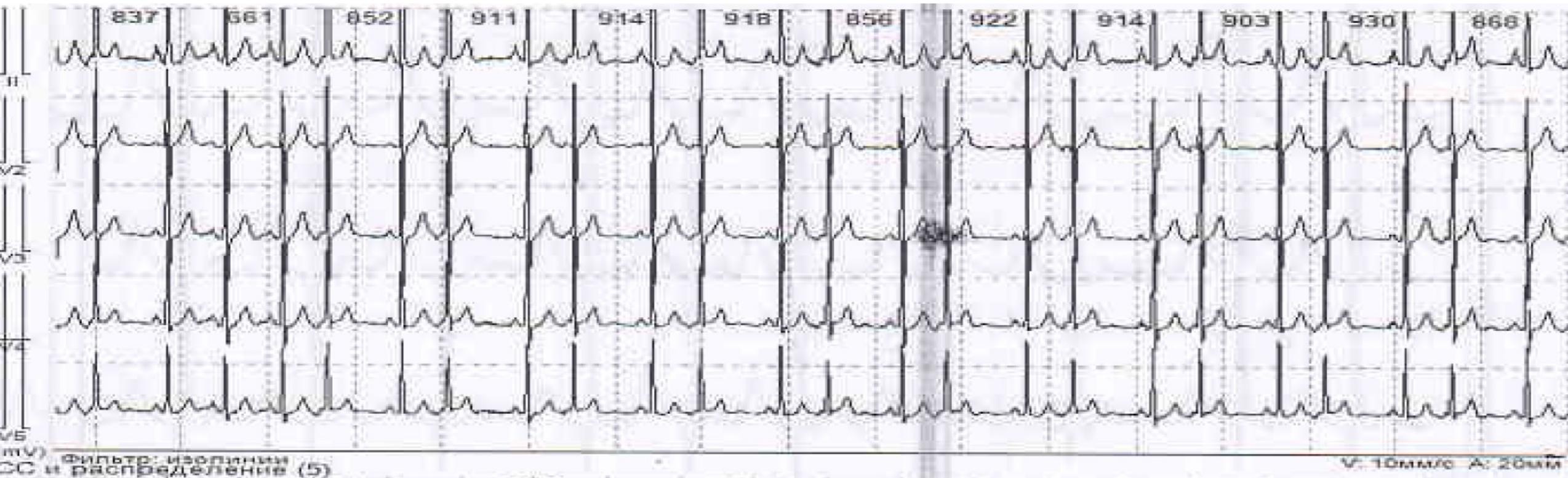


Case 3 Exercise ECG

- Bruce up to stage IV
- No signs of ischemia
- Episodes of supra-ventricular extrasystoles

Case 3 24-hour ECG recording

- No signs of ischemia
- **Supra-ventricular extrasystoles >10%**, mostly of solitary and bigeminy



Case 3 24-hour ECG recording

- 8% of sleep duration analyzed were episodes of apnea and hypopnea
- Apnea/Hypopnea Index = 15, mild to moderate Obstructive Sleep Apnea Syndrome (OSA)

Apnea Hypopnea Index (AHI)

The AHI is the number of apneas or hypopneas recorded during the study per hour of sleep. It is generally expressed as the number of events per hour. Based on the AHI, the severity of OSA is classified as follows:

- None/Minimal: $AHI < 5$ per hour
- Mild: $AHI \geq 5$, but < 15 per hour
- Moderate: $AHI \geq 15$, but < 30 per hour
- Severe: $AHI \geq 30$ per hour

Case 3 Aeromedical consideration

MED.B.015 Respiratory System

(d) Applicants with a medical history or diagnosis of any of the following medical conditions shall undertake respiratory evaluation with a satisfactory result before they may be assessed as fit:

(5) sleep apnoea syndrome;

Before further consideration is given to their application, applicants with an established diagnosis of any of the medical conditions specified in points (3) and (5) shall undergo satisfactory cardiological evaluation.

Refusal of Class 1 medical certificate issuance for further supplementary investigation and treatment

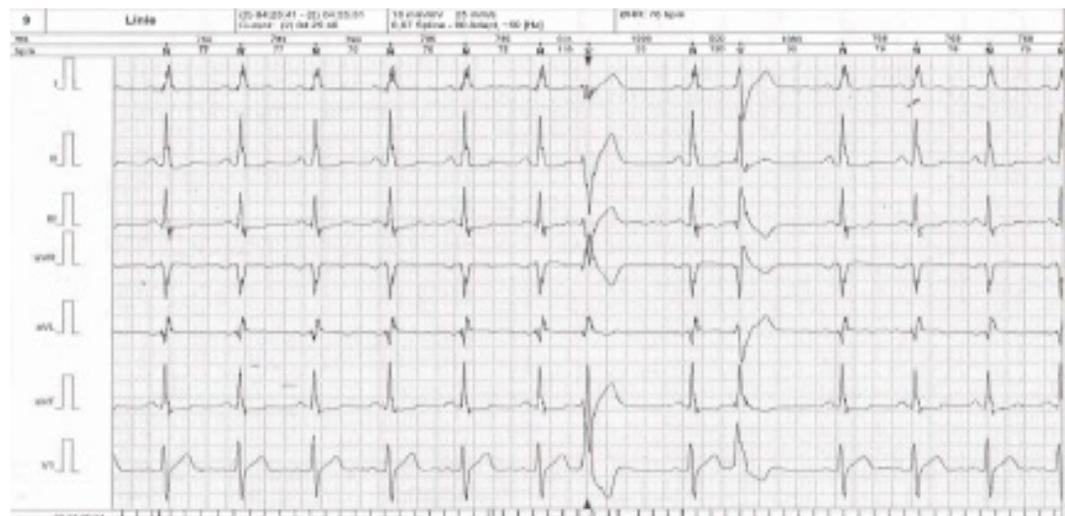
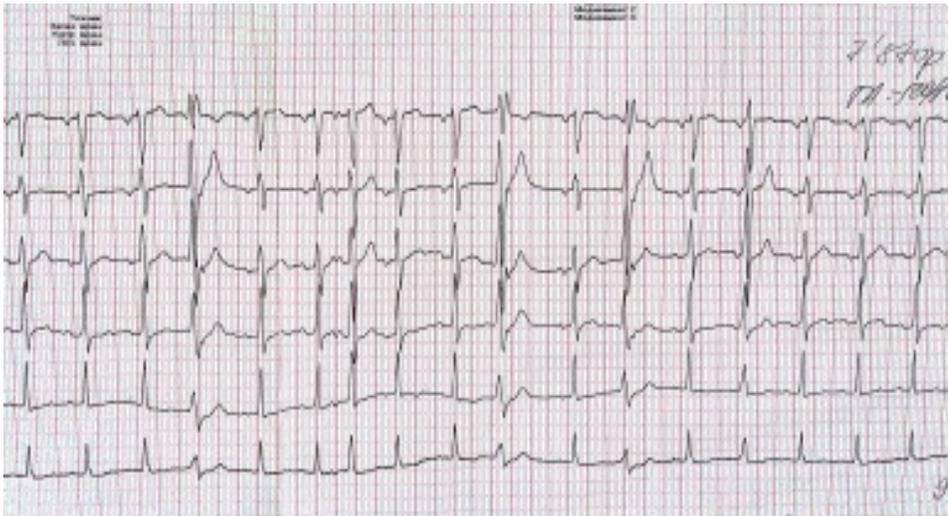
Case 3 Follow-up after treatment

- In 1,5 years, pilots comes for the renewal of the Class 1 medical certificate
- The weight was reduced, BMI – 29,3
- ECG – normal sinus rhythm,
- Stress ECG – normotensive, normal sinus rhythm,
- 24-hour ECG monitoring – solitary extrasystoles (< 0,05%), no sleep apnea episode registered

Aeromedical consideration: FIT for Class 1 medical certificate

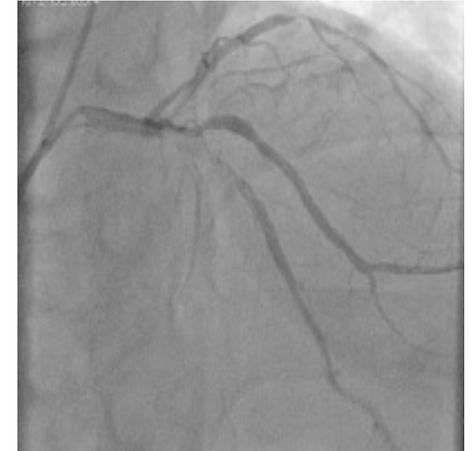
Case 4

- 60 y old ATPL helicopter pilot, 15 700 flight hours, non-smoker. Medical examination for revalidation of medical certificate Class 1:
 - Risk factors: age, male gender, dyslipidemia (total cholesterol – 5,72mmol/L, triglyceride – 1,83mmol/L), obesity (BMI – 30.3);
 - Stress ECG – **sole and groups of ventricular extrasystoles after stop of exercises;**
 - 24-hour ambulatory ECG – **10%** of ventricular extrasystoles;



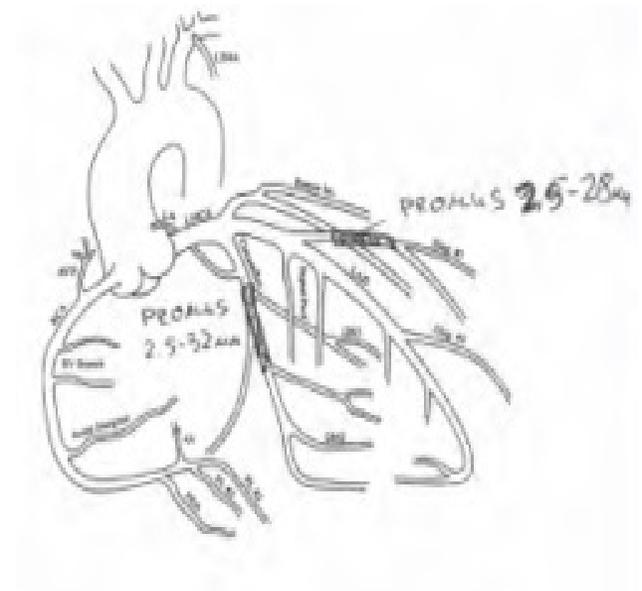
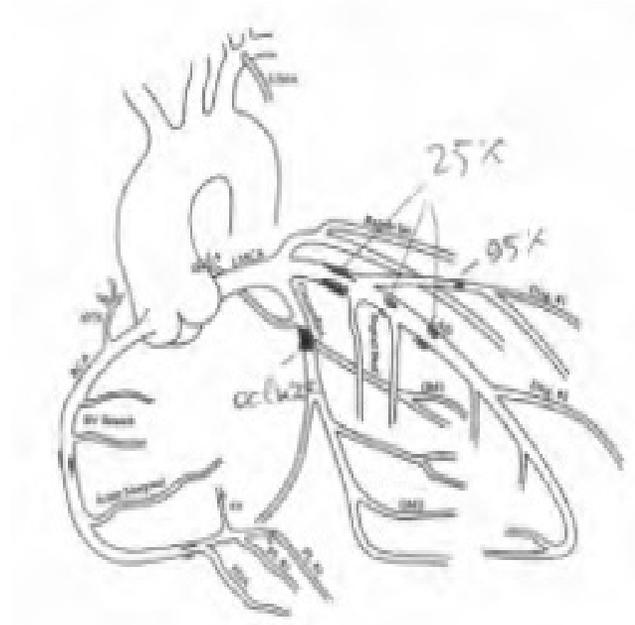
Case 4

- CCTA – Triple coronary lesion. Moderate stenosis RCA seg.II, stenosis moderate-severe in PDA, LCA, LCX, LAD.
- PTCA – Triple coronary lesion. Chronic occlusion aCX I, critical stenosis LAD-DIA I. Stenosis <25% RCA I-III, LAD I-II.



Case 4

- PCI – Revascularization of aCX I and LAD-DIA I by active pharmacological stents (DES).



Case 4 Decision

- In 6 month after the satisfactory full cardiological evaluation
 - rest and stress ECG – satisfactory
 - CCTA – complete revascularization of the myocardium, no stenosis
 - 24-hour ambulatory ECG – episodes of single ventricular extrasystoles

Aeromedical decision – FIT for flying duties Class 1 with OML limitation valid only as or with qualified co-pilot

Thank you for your attention!
Be well and healthy!

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