



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

November 25, 2020

Mary Pat McKay, MD, MPH
Chief Medical Officer

A. ACCIDENT: CEN20FA038; Evansville, IN

On December 21, 2019, at 1514 central standard time, a Piper PA-28-140 airplane, N601FL, impacted terrain near Evansville, Indiana, while on landing approach. The private pilot, who was the sole occupant, was fatally injured and the airplane was destroyed. The airplane was registered to N601FL LLC., and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91 as a personal flight. Day, visual meteorological conditions prevailed for the local cross-country, visual flight rules (VFR) flight, which departed Evansville Municipal Airport (EVV), Indiana, at 1413.

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

2. Methods

The FAA medical case review, FAA medical file, autopsy report, toxicology findings, and the investigator's reports were reviewed. Relevant regulation and medical literature were reviewed as appropriate.

FAA Medical Case Review and Medical File

According to the FAA medical documentation, the 56 year old male pilot had reported 137.4 total hours of civilian flight as of his last aviation medical exam, dated 9/11/2017. At that time, he was 78 inches tall and weighed 231 pounds. The pilot had first applied for a medical certificate in 2013, at which time he had reported a history of severe, early coronary

artery disease and a heart attack that had required 3 vessel coronary artery bypass grafting in 1999. Specifically, he had inferior hypokinesis (the scar prevented the bottom part of his heart muscle from contracting normally) from his heart attack and had arterial grafts placed to the left anterior descending artery, the posterolateral branch of right coronary artery, and the first obtuse marginal artery. Because the radial artery graft segment to the posterolateral right artery was not long enough to reach to the aorta, it was grafted onto the graft to the first obtuse marginal artery which did originate at the aorta (this created a y-graft). In 2003, the pilot had recurrent chest pain and had a stent placed in the distal right coronary artery and an angioplasty of the second obtuse marginal (stenting was not able to be performed). Six months later, in 2004, symptoms again recurred; another catheterization demonstrated restenosis at the same location but this time a stent was able to be placed in the area.

In 2014, the pilot underwent a diagnostic cardiac catheterization following an abnormal stress test. That study identified that the arterial graft to the left anterior descending (LAD) coronary artery was no longer functional but that the vessel was being fed from its native origin with only about 30% stenosis. The remaining grafts and stents were patent but the proximal (dominant) right coronary artery was completely occluded and without flow.

In addition, the pilot had reported having obstructive sleep apnea treated with a positive airway pressure (PAP) device, facial dystonia treated with routine botulinum toxin (Botox) injections, and esophagitis to the FAA. He had also reported previous ear/nose/throat and orthopedic procedures. At his last exam, he also reported using Repatha to treat his high cholesterol, clopidogrel, a platelet inhibitor, to help prevent future heart attacks, candesartan to control his blood pressure, and dextansoprazole for his esophagitis. The FAA reviewed his required annual stress test and other medical information. Electronic documentation of his PAP use indicated use for more than 99% of nights for an average of 6.5 hours. No significant abnormalities were identified on the remainder of the exam, and he was issued a special issuance third class medical certificate marked, "Not Valid for Any Class After 9/30/2018; Must Wear Corrective Lenses."

The pilot had applied for BasicMed in June 2018 having completed the BasicMed Course 6/27/2018, and the Comprehensive Medical Examination Checklist (CMEC) 6/26/2018.

Autopsy

According to the autopsy requested by the Vanderburgh County Coroner's Office, the cause of death was multiple blunt force injuries and the manner of death was accident.

The brain was not available for examination and there was injury to the heart; only a single bypass graft origin could be identified in the aorta. The right coronary artery contained a stent and appeared 95% stenotic; the graft to that artery was not described. Calcific atherosclerotic plaque occluded 98% of the proximal third of the left anterior descending coronary artery; the graft to the LAD was not described. The graft to the marginal branch was patent. The myocardium looked generally unremarkable, but no microscopic evaluation was performed. The heart had biventricular dilation and weighed 450 gm; the right ventricle was 0.3 cm thick and the left ventricle was 1.5 cm thick. (Average heart weight for a man of his weight is 399 gm with a 95% confidence interval of 302-506 gm; average wall thicknesses are 0.3 cm for the right ventricle and 1.3 cm for the left.¹) The pathologist commented that the pilot's severe coronary artery disease did "not appear contributory to the cause of death."

Toxicology

Toxicology testing performed by the FAA's Forensic Sciences Laboratory did not identify any tested-for substances in available liver tissue.²

Coronary Artery Disease

Coronary artery bypass graft surgery (CABG) is indicated when the extent of atherosclerosis in the coronary arteries precludes alternative measures and when a significant area of heart muscle is at risk. However, this procedure is not a panacea; even with intensive post surgical treatment, atherosclerosis continues to develop. Thus, the risk of death and other major adverse cardiovascular events following CABG is significant and increases over time. Among patients who required CABG before age 50, all cause mortality at 7 years was 8.9%.³ Few studies have followed sufficient numbers of patients as young as this pilot after CABG for 20 years but all demonstrate increasing risk of further cardiovascular events and mortality over time.

Medication Descriptions

Repatha is an injectable prescription medication used to treat patients with high cholesterol who are not sufficiently controlled on oral medications. It is not generally considered impairing.⁴

¹ Kitzman DW, Scholz DG, Hagen PT, Ilstrup DM, Edwards WD. Age-related changes in normal human hearts during the first 10 decades of life. Part II (Maturity): A quantitative anatomic study of 765 specimens from subjects 20 to 99 years old. Mayo Clinic Proc., 1988. 63(2): 137-46.

² See <http://jag.camii.jccbi.gov/toxicology/default.asp?offset=0> for a complete list of tested-for substances.

³ Wu C, Camacho FT, Wechsler AS, Lahey S, Culliford AT, Jordan D, Gold JP, Higgins RS, Smith CR, Hannan EL Risk score for predicting long-term mortality after coronary artery bypass graft surgery. Circulation. 2012;125(20):2423.

⁴ National Institutes of Health. US National Library of Medicine. DailyMed. Repatha. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=709338ae-ab8f-44a9-b7d5-abaabec3493a> Accessed 7/30/2020.

Clopidogrel, also marketed with the name Plavix, is a platelet inhibitor used to prevent recurrent events in patients with previous heart attacks, strokes, and vascular stents. It is not generally considered impairing.⁵

Candesartan is a blood pressure medication also marketed with the name Atacand. It is not generally considered impairing.⁶

Dexlansoprazole, also marketed with the name Dexilant, is a prescription medication that blocks the formation of acid in the stomach and is used to treat various causes of heartburn. It is not generally considered impairing.⁷

D. SUMMARY OF MEDICAL FINDINGS

The 56 year old male pilot had reported a history of severe, early coronary artery disease and a heart attack that had required 3 vessel coronary artery bypass grafting in 1999. In 2003, the pilot had recurrent chest pain and had a stent placed in the distal right coronary artery and an angioplasty of the second obtuse marginal (stenting was not able to be performed). Six months later, in 2004, symptoms again recurred; another catheterization demonstrated restenosis at the same location but this time a stent was able to be placed in the area.

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⁵ National Institutes of Health. US National Library of Medicine. DailyMed. Clopidogrel. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=edae8df1-caf9-ff72-1304-5ae8b355f8e7> Accessed 7/30/2020.

⁶ National Institutes of Health. US National Library of Medicine. DailyMed. Candesartan. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0f2b2fa3-249b-4756-a3f1-3223a004d9cb> Accessed 7/30/2020.

⁷ National Institutes of Health. US National Library of Medicine. DailyMed. Dexlansoprazole. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=9819f033-3bbe-442e-8e92-45fec77b237d> Accessed 7/30/2020.

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