

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN23LA041

MEDICAL

Specialist's Factual Report

January 17, 2023

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A. ACCIDENT

Location: Saint Joseph, Missouri
Date: November 20, 2022
Time: About 1149 Central Standard Time (CST)

B. MEDICAL SPECIALIST

Specialist Turan Kayagil, MD, FACEP
National Transportation Safety Board
Washington, DC

C. DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the pilot for potentially impairing substances and potentially impairing medical conditions.

2.0 Methods

A copy of the pilot's Federal Aviation Administration (FAA) medical certification file provided April 20, 2023, and selected hospital records from the pilot's post-crash treatment were reviewed, as were the results of toxicology testing performed by the FAA Forensic Sciences Laboratory on specimens collected during the pilot's initial post-crash medical care. Selected investigator reports and relevant regulation and medical literature were also reviewed.

D. FACTUAL INFORMATION

1.0 FAA Medical Certification File

According to his FAA medical certification file, the 49-year-old male pilot's most recent aviation medical examination before the crash was on September 15, 2022. At that time, he reported 478.3 total civilian flight hours. He was 73 inches tall and weighed 210 pounds. He reported no medication use and no active medical conditions. No significant issues were identified, and he was issued a first-class medical certificate limited by a requirement to wear corrective lenses.

2.0 Post-Crash Hospital Records

According to hospital records, the pilot was brought to the emergency room (ER) by emergency medical services (EMS) following the crash. According to ER

records, the pilot was alert and responding appropriately upon arrival, although EMS had reported that he had initially been somewhat confused after the crash. The pilot reported not remembering events leading up to the crash. ER records documented that the pilot denied having had any chest pain, shortness of breath, or dizziness prior to the crash. The pilot was found to have a small forehead abrasion without acute injury findings on head/brain imaging. The pilot underwent additional imaging to evaluate for injuries. Spinal injuries were identified, for which the pilot was admitted to the trauma service and was seen in consultation by neurosurgery.

According to neurosurgery consultation notes, the pilot reported having had a "blackout" episode in the airplane and could not recall events immediately prior to the crash. His neurological examination was normal. The pilot reported having had previous transient visual symptoms. Magnetic resonance imaging (MRI) of his brain was performed and identified a 1.9 cm x 2.2 cm x 2.3 cm brain tumor in the left posterior cranial fossa. The tumor appeared likely to be a meningioma based on its features on imaging. The brain MRI was otherwise unremarkable, without any edema noted. The neurosurgeon discussed with the pilot the possibility that the tumor may have been connected with the symptoms the pilot described before the crash. The neurosurgeon noted that a complex seizure could not be excluded, particularly with the pilot's prior history of visual symptoms. A routine electroencephalogram (EEG) performed in the hospital did not show any seizure activity, but was nonspecifically abnormal, with mild diffuse slowing and mild slowing in the left occipital leads compared to the right. The pilot was discharged with a plan for outpatient follow up, and instructions not to drive or fly. He was diagnosed with a brain mass and injuries including closed head injury. He was not diagnosed with seizure or prescribed anti-seizure medication at the time of hospital discharge.

No other significant natural disease was identified as a result of the pilot's hospital testing. Hospital records documented that the pilot reported a history of headaches and sometimes used over-the-counter medication on an as-needed basis.

In the hospital, a clinical test of blood collected from the pilot at 1250 CST on the crash date was negative for alcohol. A clinical screen of urine collected from the pilot at 1500 CST on the crash date was negative for tested-for substances.¹

3.0 FAA Toxicology

The FAA Forensic Sciences Laboratory performed toxicology testing of blood and urine specimens collected during the pilot's initial post-crash medical care.² No

¹ The lab report listed tested-for substances as amphetamines, barbiturates, benzodiazepines, cocaine, opiates, PCP, THC, methadone, MDMA (Ecstasy), and oxycodone.

² According to an FAA Forensic Sciences Laboratory e-mail, the blood and urine specimen containers received from the hospital bore labels with the crash date, and had 1250 and 1500 written on them, respectively. Hospital records documented that there was blood collected at 1250 and urine collected at 1500 on the crash date.

alcohol or controlled substances were detected. No substances that are generally considered impairing were detected in the pilot's blood.

4.0 Description of Meningioma

Meningioma is the most common type of primary brain tumor. Meningiomas grow from the meninges, tissues that surround the brain within the skull. Most meningiomas are non-cancerous and grow very slowly, often without ever producing significant symptoms. As such, many meningiomas are initially diagnosed as incidental findings on imaging performed for other reasons (and many others go undiagnosed, as evidenced by autopsy data). Symptoms that do occur depend partly on tumor size and location. Headache and visual changes may be among these symptoms. Seizures are a common presenting symptom and are present in roughly 30% of patients whose meningiomas are diagnosed.³⁻⁹

E. SUMMARY OF MEDICAL FACTS

The 49-year-old male pilot's most recent aviation medical examination before the crash was on September 15, 2022. At that time, he reported no medication use and no active medical conditions. He was issued a first-class medical certificate limited by a requirement to wear corrective lenses.

Emergency medical services reported that the pilot initially had some confusion after the crash. By the time he arrived at the hospital, he was alert and not

³ Park JK, Shih HA. Patient education: meningioma (beyond the basics). In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/meningioma-beyond-the-basics>. Updated September 2, 2022. Accessed January 8, 2024.

⁴ Park JK. Epidemiology, pathology, clinical features, and diagnosis of meningioma. In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/epidemiology-pathology-clinical-features-and-diagnosis-of-meningioma>. Updated August 15, 2023. Accessed January 8, 2024.

⁵ Englot DJ, Magill ST, Han SJ, Chang EF, Berger MS, McDermott MW. Seizures in supratentorial meningioma: a systematic review and meta-analysis. *J Neurosurg*. 2016;124(6):1552-1561. doi:10.3171/2015.4.JNS142742.

⁶ Elbadry Ahmed R, Tang H, Asemota A, Huang L, Boling W, Bannout F. Meningioma related epilepsy-pathophysiology, pre/postoperative seizures predictors and treatment. *Front Oncol*. 2022;12:905976. doi:10.3389/fonc.2022.905976.

⁷ Wong ET, Wu JK. Overview of the clinical features and diagnosis of brain tumors in adults. In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/overview-of-the-clinical-features-and-diagnosis-of-brain-tumors-in-adults>. Updated October 19, 2023. Accessed January 8, 2024.

⁸ Vernooij MW, Ikram MA, Tanghe HL, et al. Incidental findings on brain MRI in the general population. *N Engl J Med*. 2007;357(18):1821-1828. doi:10.1056/NEJMoa070972.

⁹ Wiemels J, Wrensch M, Claus EB. Epidemiology and etiology of meningioma. *J Neurooncol*. 2010;99(3):307-314. doi:10.1007/s11060-010-0386-3.

confused. He had a normal neurological examination. He reported being unable to recall events immediately prior to the crash. He denied having had any chest pain, shortness of breath, or dizziness prior to the crash. He was admitted for further evaluation of injuries. Subsequently, magnetic resonance imaging (MRI) of his brain identified a 1.9 cm x 2.2 cm x 2.3 cm brain tumor in the left posterior cranial fossa. The tumor appeared likely to be a meningioma. The brain MRI was otherwise unremarkable. The hospital neurosurgeon discussed with the pilot the possibility that the tumor may have been connected with the symptoms the pilot described before the crash. The neurosurgeon noted that a seizure could not be excluded, particularly considering a history of prior transient visual symptoms reported by the pilot. A routine electroencephalogram (EEG) performed in the hospital did not show any seizure activity, but was nonspecifically abnormal, with mild diffuse slowing and mild slowing in the left occipital leads compared to the right. The pilot was discharged with a plan for outpatient follow up, and instructions not to drive or fly. He was diagnosed with a brain mass and injuries including closed head injury. He was not diagnosed with seizure or prescribed anti-seizure medication at the time of hospital discharge. No other significant natural disease was identified as a result of the pilot's hospital testing. Hospital records documented that the pilot reported a history of headaches and sometimes used over-the-counter medication on an as-needed basis.

In the hospital, a clinical test of blood collected from the pilot at 1250 CST on the crash date was negative for alcohol. A clinical screen of urine collected from the pilot at 1500 CST on the crash date was negative for tested-for substances. FAA Forensic Sciences Laboratory toxicology testing of blood and urine specimens collected during the pilot's initial post-crash medical care did not detect alcohol or controlled substances. No substances that are generally considered impairing were detected in the pilot's blood.

Submitted by:

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