

Aircraft type and registration:	Bell 206B Jet Ranger III G-NORM (light single-engined helicopter)	
Year of manufacture:	1978	
Date and time (GMT):	13 May 1984 at 1725 hrs	
Location:	Parwich, nr. Ashbourne, Derbyshire	
Type of flight:	Private	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – 1 (fatal)	Passengers – N/A
Nature of damage:	Main rotor destroyed; severe damage to forward cabin, tail boom and rotor assemblies	
Commander's Licence:	Private Pilot's Licence (A) and Private Pilot's Licence (H)	
Commander's Age:	35 years	
Commander's total flying experience:	60 hours fixed-wing and 73 hours helicopter (of which 23 hours were on type)	
Information Source:	AIB Field Investigation	

History of the flight

The helicopter landed at a field site to disembark a passenger. It remained on the ground for only a short time with the engine running and the rotors turning. When it lifted off, it was seen by an eye-witness to rise to a low hover, estimated to be only 2 or 3 feet, turn slightly to the right and drift to the right until the right skid touched the ground and the helicopter tilted to the right. The main rotor struck the ground and part of one blade entered the forward cabin fatally injuring the pilot-in-command, who was occupying the right hand seat. The occupant of the left front seat, who was also a pilot, suffered only minor injuries. His helicopter flying experience was similar to that of the pilot-in-command and he described how he had noted a reading of about 70% torque in the hover after lift-off, that he had glanced to the left to check for obstructions and then sensed that the helicopter was beginning to move sideways to the right. He waited for this drift to be corrected but, before the appropriate control input was made, the drift was abruptly arrested and the helicopter toppled on to its right side. He released his safety harness, fell to the right side of the cabin and left the aircraft through the shattered roof panel. After helping to extricate the body of the pilot from the wreckage, he returned to the cabin where he shut down the engine and switched off the fuel and electrical power.

The site where the accident occurred was a field with an up-slope of approximately 5° from north to south. The surface was undulating, with a number of ridges, also running north/south, some 5 metres apart. The tops of the ridges were 18 inches above the troughs between them. The helicopter had landed on a ridge facing down the slope to the north. A large hill in the foreground of the pilot's view blanked-off the natural horizon and gave only a poor horizontal reference. A vertical reference was provided by a tall pole some 60 metres in front of the helicopter. The wind was less than 10 kt from the north-north-east and would have required the pilot to turn through approximately 20° to the right to depart into the wind.

Wreckage and impact information

Examination of the accident site showed that the main rotor had contacted the ground with the aircraft moving to the right and the blade disc inclined approximately 30° to the right. The ground contact broke off a length of approximately 1 metre from the end of one rotor blade, and the resulting reaction caused the main rotor shaft and gearbox to pivot backwards. This movement was sufficient for the other blade to strike the vertical tail-fin, causing a failure of that blade approximately 2 metres from the tip. The inner and outer portions of this blade remained attached at their trailing edges and the flailing outer portion struck the right side of the cabin with considerable force. The blade caused separation of the forward door and severe damage to the right side of the instrument console. The blade also struck the pilot and impacted on his harness release box, causing the two right-hand straps to release and allowing the pilot to fall through the door aperture.

The wreckage was recovered to the AIB facility at Farnborough where the mechanical flying controls were examined. All hydraulic connectors were found to be correctly assembled and tightened. The collective pitch and cyclic pitch actuators were tested and found to function correctly. All other components of the hydraulic flying control system were also tested and no faults were found. It is concluded, therefore, that the flying controls would have produced normal aircraft behaviour provided the hydraulic system switch was in the 'ON' position. The position of this switch at the time of take-off could not be determined from the wreckage but, as the aircraft had landed only a short time before to carry-out a rotors-running tumround, there is no reason to suppose that the hydraulic system might have been switched off.

Medical and pathological information

Post-mortem examination of the pilot revealed no pre-existing disease that might have caused or contributed to the accident. However, toxicological examination revealed significant traces of quinine in the pilot's liver and urine. The traces in the urine were appropriate to the consumption of a modest quantity of tonic water within the previous 24 hours. The concentration in the liver would appear to indicate a somewhat longer term of consumption of quinine in some form. It is known that a significant level of quinine in the body tissues can result in mild toxic effects, including impairment of the organs of balance and vision and increased susceptibility to disorientation.

Discussion

The available evidence gives no precise indication as to why the helicopter drifted sideways until the right skid hit the ground. The nature of the site required the exercise of special care by the pilot and, whilst there is no evidence to suggest that he did not have the skill and ability to take-off safely from this site, the undulating ground, the down-slope and the poor horizontal reference could have contributed to the accident. There is also a possibility that the presence of quinine in the body tissues of the pilot could have affected his sense of balance and orientation, or his visual acuity.