

Tod des amerikanischen Tauchers in einer überfluteten Mine in Canada; Todesursache AGE, verursacht durch Tumor in der Lunge, welcher die Belüftung lokal verhinderte

-----Ursprüngliche Nachricht-----

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Betreff: [divingaccidents] Re: Joe Steffen autopsy conclusion

I just found this write-up at <http://oceanquestcharters.com/en/>.

Following is a medical description of Joe's death by Dr David Sawatzki MD, a Diving Medicine Consultant and Mine Quest Team Member who was also present at the dive site when the incident occurred:

Joe headed out on the mainline from a depth of 50 ft, about 300 feet from the surface. His body was found on the ceiling of the passage at a depth of approximately 30 feet about 250 feet into the mine, an hour or so later. His mask was full of water and the second stage of his primary regulator was missing (*it had come off the LP hose and was found later on the floor*).

The autopsy showed that Joe had died from **arterial gas embolism**. It also showed that he had **a mass in the periphery of his lung** and **another mass in his liver, most likely cancer**. It was the opinion of the pathologist that these masses would not have caused any symptoms and would not have shown on chest x-ray. Joe almost certainly did not know of them.

Arterial gas embolism is virtually impossible in this section of the mine in a diver with normal lungs. The passages are 10 feet high and at a 10 degree slope. The average cave diver swims at 50 ft per minute and swimming 50 ft up slope results in an ascent of 8 feet. Joe had done three dives the week before his death in the same passage without problem.

The mass in Joe's lung must have been mostly obstructing one of the airways in his lung. As he descended the part of his lung supplied by the obstructed airway would have collapsed and then slowly inflated at depth. As he swam back up the passage, the gas would have expanded. The obstructed airway was obviously large enough to allow the gas to escape at the normal ascent rate of 8 feet per minute on the first three dives.

On the day of his death, when Joe left the 50 foot depth and started swimming up the slope to surface, the obstructed part of his lung would have fully inflated. The second stage of the regulator he was breathing most likely separated from the LP hose at that point, causing Joe to hold his breath as he attempted to insert his secondary regulator. The rest of his lungs would almost certainly NOT be fully inflated at this time. While he was holding his breath he must have floated to the roof of the passage, ruptured the section of the lung beyond the obstruction and suffered arterial gas embolism. In this situation, the embolism would have happened if Joe simply lost control of his buoyancy and floated to the ceiling, even if he had been breathing normally. In a diver with normal lungs, embolism is virtually impossible at this depth in this passage.

Joe's death was from arterial gas embolism, primarily as a result of the lesion in his lung, most likely cancer. If it was cancer and it had already spread to his liver, he could have expected a miserable death in a relatively short time. Dying a peaceful death, doing an activity he loved, in the company of friends would be considered by most people to be a far better way to die than to die from lung cancer.