

PULMONARY BAROTRAUMA IN A FREE DIVER WHO BREATHED COMPRESSED AIR AT DEPTH; A CASE REPORT

Akin S. Toklu¹, Ahmet Höbek¹, Mustafa EreleP, Alper Toker³

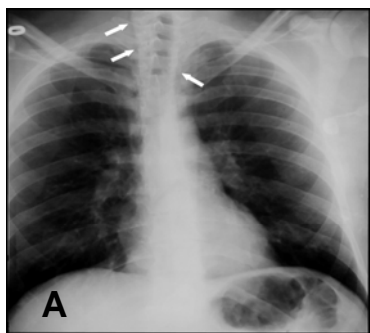
1-Department of Underwater and Hyperbaric Medicine, 2-Department of Pulmonary Disease, 3-Department of Thoracic Surgery
Istanbul University, Istanbul Faculty of Medicine, Istanbul, TURKEY

INTRODUCTION

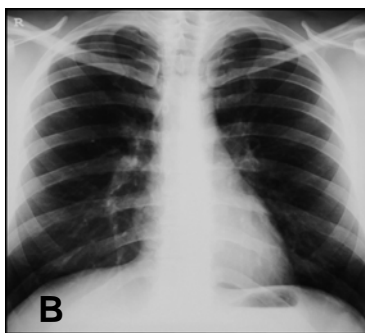
Pulmonary barotrauma (PBT) can be described as the physical damage to the lung tissue by the change of volume of gas in the lung, due to the changes in environmental pressure. PBT is especially a risk for the divers who breathe compressed gas while immersed at pressure in contrast to free divers. PBT of descent is more likely than PBT of ascent in breath hold diver.

CASE

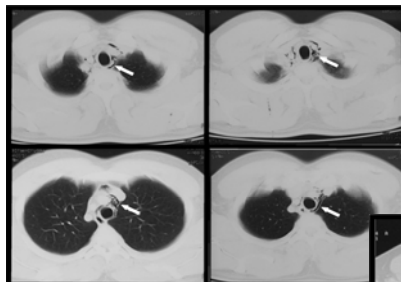
An otherwise healthy 36-year-old-man made breath hold diving three times in the morning to the depth of 3-5 meters without any problem. He made his last dive in the afternoon to the depth of 9 meters, while his friend was underwater with SCUBA gear at the same depth. He approached to his friend and took his extra regulator to share his air, when his was short of breath. After breathing several times, he left his friend and started to ascent. He ignored to exhale while ascending and he felt pressure increase in his thorax at 4-5 meters. Some air came out of his lung involuntarily when he was about to surface. He felt substernal pain, jerking and sensational change in the right lower extremities and right side of his body. He could hardly be withdrawn to the boat and he felt weakness in his right lower extremities. He had dysarthria which subsided in 10 minutes. His complaints almost were disappeared in 30 minutes except the chest pain. An ambulance could be reached him in 30 minutes and the treatment was set as Oxygen administration with nasal cannula, dexamethasone 8 mg IM and infusion of electrolyte solution during the transfer to the hospital. At the hospital consultation with diving physician was made over the telephone and PBT was suggested as pre-diagnosis and a high resolution computed chest tomography (HRCT) was recommended. The patient was referred to nearest center for HRCT after X-Ray was taken.



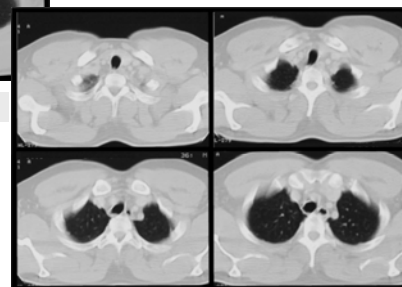
A: After the accident



B: Three weeks post accident



HRCT, After the accident



HRCT, Three weeks post accident

The patient reported that substernal pain decreased in half an hour after the treatment started. There was no pathological finding reported after the examination at the hospital where the HRCT was performed. He was discharged in the evening on the same day and he applied to The Department of Underwater and Hyperbaric Medicine, Istanbul Faculty of Medicine next day, since he had slight chest pain while breathing.

On the examination, mediastinal emphysema findings were detected in his chest HRCT and X-Ray. Pulmonary diseases and thoracic surgery specialists consulted the patient for the treatment. There was no recommendation except prohibition of diving. The patient was asked for control with CT scan of chest in three weeks. The previous findings of mediastinal emphysema were disappeared in control CT scan. There was no pathology detected during the control after six months and he started breath-hold diving gradually.

DISCUSSION

Pulmonary barotrauma is usually seen in the SCUBA divers if there is an air trapping during ascent caused by uncontrolled decompression, breath holding and existence of an air trapping lesion in the lungs. The air expanded according to the Boyle's Law in the lungs should be exhaled enough during ascent to prevent PBT. In this case it was ignored to exhale the expanded air in the lung. PBT may be asymptomatic or manifest with a variety of symptoms.