From Depth to Altitude: Case Report of Type I Decompression Illness Triggered by Air Travel

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BACKGROUND

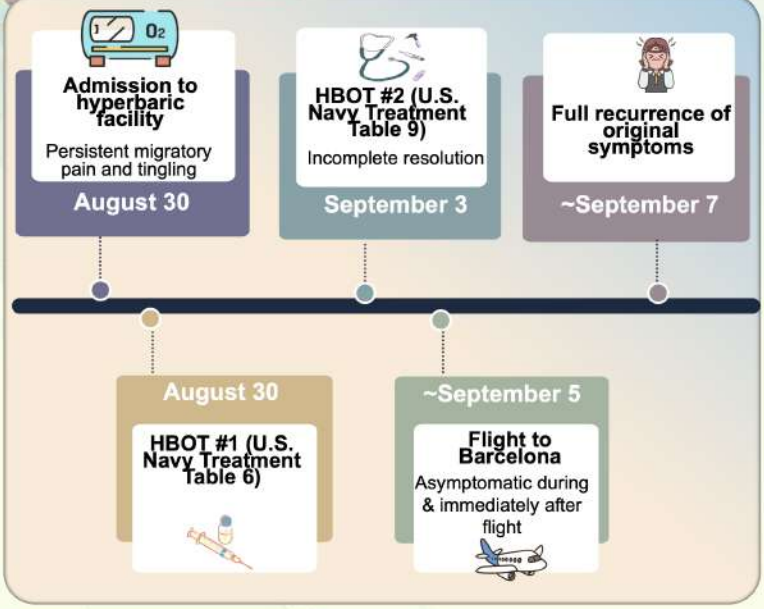
Decompression Illness (DCI) is a disorder syndromes caused by inert gas bubble formation due to sudden reduction in ambient pressure. Flying after diving further increases the risk due to cabin altitude exposure, which acts as a "second decompression". Although Pre-flight Surface Interval (PFSI) guidelines exist to mitigate risk, their protective effect is not absolute. This report highlights a case of recurrent Type I DCI despite adherence to guideline-conformant PFSI.

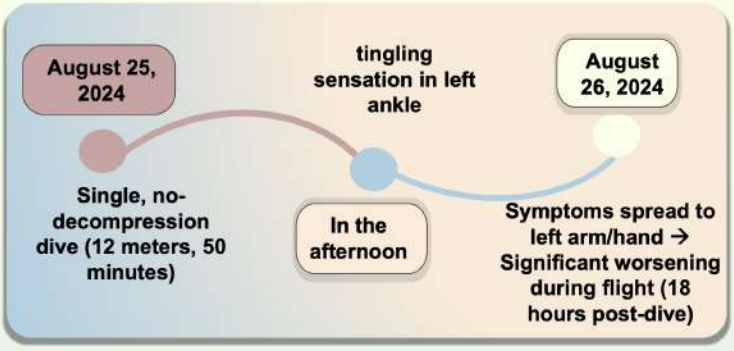
CASE REPORT

A 48-year-old female recreational diver completed a single no-decompression dive to 12 meters for 50 minutes. About 18 hours after surfacing, she boarded a commercial flight and subsequently developed worsening migratory arthralgia and paresthesia. Upon hospital admission, she was diagnosed with Type I DCI, with blood gas analysis showing severe hypoxemia and electrolyte imbalance.

No visible abnormalities in the heart and lungs

Clinical Timeline





Blood Gas Analysis

TEST	RESULT	UNIT	REFERENCE RANGE
pH	7.376		7.350 - 7.450
pCO2	38.5	mmHg	35.0 - 45.0
pO2	L 24.6	mmHg	80.0 - 100.0
Sodium	137.7	mmol/L	135.0 - 148.0
Ionized Calcium	L < 0.10	mmol/L	1.150 - 1.350
Potassium	4.26	mmol/L	3.50 - 4.50
HCO3	22.1	mmol/L	
BEecf	-3.12	mmol/L	
SO2 (c)	L 51.6	%	75.0 - 99.0
AaDO2	645.5	mmHg	
Body Temperature	36.4		
FIO2	100	%	
pH(T)	7.385		
pCO2(T)	37.5	mmHg	
pO2(T)	23.6	mmHg	

DISCUSSION

This report illustrates how even a single, low-risk recreational dive can result in significant decompression illness when followed by premature air travel. The patient's symptoms were **aggravated** by altitude exposure, which expanded residual nitrogen bubbles and worsened tissue injury. Although she observed the recommended 18-hour PSFI, flying while symptomatic invalidated the guideline's safety assumptions and led to further complications. This highlights that existing decompression and pre-flight guidelines are population-based and must not replace clinical judgment. Hyperbaric treatment using USN TT6 followed by TT9 was appropriate and effective for symptom control, though recurrence after a second flight indicates incomplete physiological recovery. A conservative post-treatment, PSFI of at least 72 hours is therefore essential. Furthermore, the undeserved nature of her DCI suggests a need for evaluation of predisposing factors such as a patent foramen ovale to guide future diving safety.

CONCLUSION

The present case highlights that even a single, shallow recreational dive followed by premature air travel can lead to significant decompression illness. Flying while symptomatic was a key factor worsening the condition, emphasizing the need for strict adherence to post-dive flight intervals and greater diver awareness of early DCI symptoms.

REFERENCE