

A New Case of Fatal Pulmonary Thromboembolism Associated with Prolonged Sitting at Computer in Korea

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A newly reported, variant form of venous thromboembolism (VTE), named as "eThrombosis", occurred in a patient who maintained a prolonged sitting position at a computer. The patient fortunately recovered from the disease through early diagnosis and treatment. Recently however, the author experienced a new case of a 24-year-old Korean man who died due to "eThrombosis" after playing an Internet computer game continuously for about 80 hours. Based on this case, the author would like to warn heavy computer users of the risk of "eThrombosis", as they might also be at risk. Sitting for a long time at the computer results in an immobility that is a new and large risk factor of life-threatening VTE.

Key Words: DVT, eThrombosis, immobility, sitting position, computer

INTRODUCTION

Since Simpson reported the first case of venous thromboembolism (VTE),¹ well-known risk factors of VTE have been recognized as old age, bed rest, immobility, and long travel (e.g., in an airplane or other transport vehicle with restricted space).²⁻⁴ Nowadays, the wide spread use of computers and the Internet has brought about great changes of life-style. Recently, after Beasley et al. reported a new case of VTE owing to long-term use of computer,⁵ the author discovered a new variant case of death from VTE, due to the prolonged sitting position while playing a computer game.

Following is the case report.

CASE REPORT

A 24-year-old unemployed male visited a computer game room and commenced playing "myu" game from 9:24p.m. on October 4 to 10:40 a.m. on October 8, 2002, with minimal sleep and only unhealthy instant noodles for food. He abruptly collapsed in front of the counter, then recovered consciousness shortly after and made a call. One hour later, however, he was found dead in the toilet.

Autopsy findings

There were no specific findings of a through external examination. An internal examination revealed only fatal pulmonary thromboembolism with common findings of sudden death. The left and right lungs weighed about 349 and 522g, respectively. Thromboemboli completely obstructed (in a stag-horn shape) the main trunk of both pulmonary arteries, and impacted across the bifurcation (saddle emboli) to smaller branching arteries (Fig. 1). Thrombi were founded in both deep popliteal veins (Fig. 2). The gross findings of thromboemboli showed fresh surface without any imprints of venous valves on its surface and was of variable size (width 13-16 mm, length 71-107 mm). Histologic examination of both lungs showed multifocal pulmonary hemorrhage without the changes of infarction. There was no indication of any specific disease or injury. No toxic agents or alcohol components were detected

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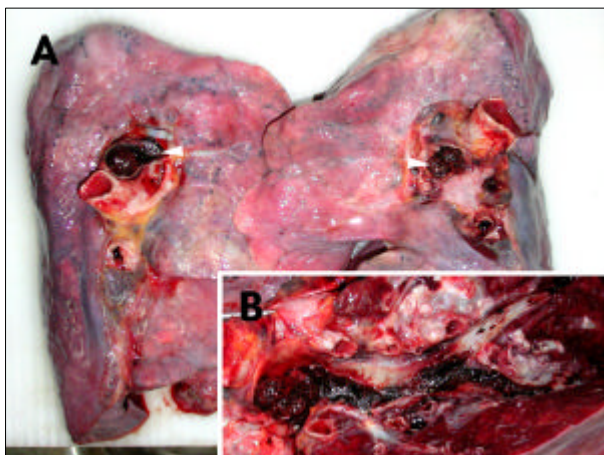


Fig. 1. (A, B) Large saddle thromboemboli (white arrow head) lying astride the main left and right pulmonary arteries.



Fig. 2. Large thrombi impacted in both deep popliteal veins.

in the blood or gastric contents. No evidence of hemostatic disorder was found in his past or family history.

DISCUSSION

Deep venous thrombosis (DVT) affects mainly the veins in the lower legs and the thighs. It involves the formation of a clot (thrombus) in the larger veins of these areas. This thrombus may interfere with circulation of the area, and it may break off and travel through the blood stream (embolization). The created embolus thus can lodge in the brain, lungs, heart, or other organs, causing severe damage to those organs. DVT as a result of prolonged sitting was first recognized during the Blitz in World War II, when cases of

fatal embolisms emerged among Londoners who sat for long periods in deckchairs in air-raid shelters.¹ Thereafter, Homans first reported that VTE may occur after prolonged sitting in various situations, such as in airplane flights, car trips and even movie theatres.² Developing DVT after long plane rides is often called "economy-class syndrome" or "coach-class syndrome", because seating and leg room are particularly cramped for passengers in economy class.^{3,4} Nevertheless, researchers say it can occur in any seating where passengers are immobile.

Many symptoms that are associated with long-lasting use of computers have recently been reported owing to the wide use and rapid spread of computers. Such symptoms have certain characteristics that may occur without any relation to age, sex or occupation. Beasley et al. made the early diagnosis and treatment of VTE, and reported this case as a new variant form. Their patient used to sit immobile at his computer screen, at work and at home, for 12 hours a day, and occasionally for up to 18 hours. They suggested the condition be called "eThrombosis".⁵ To date, there has been no report of death owing to VTE associated with long-term computer use. Recently however, the author experienced a fatal case in Korea after playing a computer game for nearly four days of board-and-lodging (about 80 hours) while continuously sitting on a chair. According to eyewitnesses' accounts, autopsy findings, and toxicology, the author concluded that the cause of death was fatal pulmonary thromboembolism. Furthermore, the author agreed with Homans and Beasley et al. that the pathogenesis was immobility associated with prolonged sitting position.

Especially in Korea, data released in 2002 from the Korea Statistical Information System (KOSIS) showed that the rate of computer possession was 67.1 out of 100 households, the rate of internet use among over 6-year-old children was 100%, and the mean, weekly, computer-use period was 12.2 hours.⁶ The socioeconomic status of computer use in Korea would seem to carry a strong possibility for this newly-developed variant of VTE and more fatalities are experienced than in other countries due to the longer time period of playing computer games. This increased risk could be related to the

wide spread use of computers, construction of Internet communication systems, development of PC game rooms, and increase of unemployment among those with high educational background. From this point of view, the author would like to warn about the potential danger to humans of high computer usage despite the indifference regarding the threat to health among high computer users. Our modern society is very sensitive about computer viruses and other dangers to computers, computer programs and data, yet not to possible human injury.

In conclusion, the author presents the first case of death owing to computer-related DVT "eThrombosis" in Korea. As new types of lifestyle spread rapidly based on the increased time spent in front of computers, the author suggests that immobility associated with sitting for a long time at the computer is a newly discovered risk

factor of the life-threatening VTE.

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