

## Economy Class Syndrome After Long Duration Bus Travel

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A 65 year-old man with heart failure due to hypertensive and ischemic heart disease was admitted to the hospital with dyspnea, bloody sputum and pleuritic chest pain after a 52-hour bus trip. Clinical and laboratory evaluation included chest helical tomography that demonstrated a filling defect of the right main branch of the pulmonary artery and a regular peripheral opacity of triangular shape in the inferior lobe of the lower lung. The diagnosis of pulmonary thromboembolism was made and therapy with heparin, followed by warfarin was introduced. The patient was discharged from the hospital. The diagnosis of pulmonary embolism should be considered in patients with complaints like this patient after long-distance bus travel.

### INTRODUCTION

Deep vein thrombosis and pulmonary embolism after a 14 hour flight was reported in 1954<sup>1</sup>, a condition that has later been referred to as the “economy class syndrome”<sup>2</sup>.

In addition, such occurrences were also reported after long duration travels by other means of transportation, which further emphasized the pathophysiology of prolonged sitting in a tight position, which led some authors to call this condition “traveler’s thrombosis”<sup>3,4</sup>.

In Brazil, a country with continental dimensions, long distance travels by bus are fairly common. São Paulo City is an active economic pole in the country and a very large city (10,6 millions of habitants)<sup>5</sup>. As a result, long distance bus travels from distant cities to São Paulo are fairly common. The main bus station in São Paulo serves 21 states, 7 regions (North, Northeastern, South, Countryside, North coast of São Paulo State, Fluminense Coast and Capixaba Coast), besides four countries - Chile, Paraguay, Argentina and Uruguay. In the bus station Tietê there are 65 companies, 304 bus routes that serve 1,010 cities<sup>6</sup>. In 2002 there were in average over 60,800 daily bus arrivals and departures<sup>7</sup>. Many departures are to travels longer than 6 hours. Thus,

thrombotic complications related to these travels may come to clinical attention.

We report the case of a patient who developed pulmonary embolism after a very long distance bus travel (about 3,000 km) from Ceará state in the northeast of the country to São Paulo.

### CASE REPORT

A 65 year-old man was admitted to the hospital with severe dyspnea, bloody sputum and pleuritic chest pain.

He had traveled by bus for 52 hours from the state of Ceará to São Paulo City. Soon after arrival, he developed dyspnea, bloody sputum and pleuritic right chest pain. The dyspnea gradually increased and the patient eventual sought medical care, and was referred to the hospital 15 days after the onset of symptoms.

His past medical history included systemic arterial hypertension, stable angina pectoris and exertional dyspnea since four months before. He was on irregular treatment with lisinopril and hydrochlorothiazide. The patient was a former smoker and a heavy drinker.

On admission, the physical examination revealed dyspnea, a weight of 67.4 kg, and a height of 161.7 cm. The respiratory rate was 52/minute, the pulse was regular, the pulse rate 120 beats per minute, the blood pressure 160/80 mmHg, and the temperature was 36°C. There was jugular venous engorgement. The chest examination revealed decreased respiratory sounds and rales over the lower right lung fields. The heart examination revealed frequent premature beats. On the examination of the abdomen, the liver was felt 3 cm below the right costal margin.

The diagnoses of pulmonary embolism associated and heart failure due to hypertensive heart disease and ischemic cardiomyopathy were made.

The chest X-ray showed irregular opacities in the middle and right lower lobes.

The electrocardiogram demonstrated left atrial and left ventricular hypertrophy, pathologic Q waves, suggestive of an old lateral infarct, and nonspecific ST-T segment abnormalities.

Blood analysis revealed hemoglobin 11 mg/dL, hematocrit 32%, leukocyte count 8,500 / mm<sup>3</sup> (76% neutrophils, 13% lymphocytes, 11% monocytes), 655,000 platelets / ml, serum creatinine 0.9 mg/dl, prothrombin time of 17.4s (normal up to 14.5s) with prothrombin activity of 77% (INR=1.2), partial thromboplastin time 36.4 s (normal up to 28s / R=1.3) and a thrombin time of 14.3 s (normal up to 12s).

A chest helical CT revealed a dilation of the pulmonary artery and its main branches with a filling defect of the right main branch and a regular peripheral opacity of triangular shape in the inferior lobe of the lower lung.

The diagnosis of pulmonary thromboembolism was made.

Therapy included bed rest, intravenous unfractionated heparin, followed by warfarin properly tailored to achieve an INR between 2 and 3.

A transthoracic echocardiogram showed global left ventricular dysfunction, left and right chambers dilation (left ventricular end diastolic diameter of 6.8cm; left ventricular ejection fraction 34%, left atrium diameter 4.7cm); cardiac thrombi were not found.

Cardiac catheterization study revealed pulmonary hypertension (pulmonary artery systolic pressure 60mmHg). The angiogram demonstrated moderate right atrial and right ventricular enlargement. Coronary angiography revealed 80% stenosis of the anterior diagonal and the circumflex artery branch of the left coronary artery.

The patient recovery smoothly and was discharged 32

days after admission.

The patient is well 8 months after discharge.

## DISCUSSION

The case of this patient demonstrate that deep vein thrombosis may occur after long duration bus travel. Since long distance bus travels are fairly common, the issue may as well have public health relevance. Controversy has been raised though, due to the fact that most of the evidence of the association between travel and deep vein thrombosis is based on retrospective data and that other authors have not found such an association<sup>8-10</sup>.

Interestingly, two prospective studies addressed the subject<sup>11,12</sup> and detected an incidence of asymptomatic deep vein thrombosis in up to 10% of long distance air travelers, which also may be prevented by compressive stockings<sup>11</sup>, although they may had included mostly moderate to high risk populations. No data is available, though, on the clinical significance of these findings, and even questions have been raised on the possible consequences of an overestimation of such risk<sup>13</sup>.

We were not able to identify reported cases in this population that travel for long distances by bus in our country. In addition in this patient there was also a high platelet count without apparent hematologic disease; he had also been a smoker. Therefore, although a causal association of deep vein thrombosis and long distance bus traveling in the general population may be debatable, patients with higher risks for deep vein thrombosis might benefit of preventive interventions<sup>14</sup>, precautions must be increased before other risk factors for deep vein thrombosis in passengers who travel more than 10 hours<sup>15</sup> as avoiding prolonged sitting in a tight position.

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