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# An Unexpected Complication of Traditional Thai Massage

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**Abstract :** **Traditional massage is one of the art of the Thai people, but its application in an inappropriate situation or with incorrect technique may contribute to severe complications. We report a 46-year-old man who was massaged by his nephew in order to relieve an aching right leg. Unfortunately, he developed a deep venous thrombosis with subsequent acute pulmonary embolism. Emergency embolectomy was performed because the thrombus engaged into the left heart through the foramen ovale.**

**เรื่องย่อ :** ภาวะแทรกซ้อนที่คาดไม่ถึงจากการนวด

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การนวดแผนโบราณเป็นศิลปะทางภูมิปัญญาอย่างหนึ่งของคนไทย แต่การนำไปใช้ในสถานการณ์ที่ไม่เหมาะสมหรือไม่ถูกวิธี อาจนำมาซึ่งผลแทรกซ้อนที่รุนแรงและเกิดความสูญเสียได้ บทความนี้เป็นรายงานผู้ป่วยชาย อายุ 46 ปี ได้รับการนวดโดยหลานเพื่อบรรเทาอาการปวดเมื่อยที่ขาขวา แล้วเกิดภาวะลิ่มเลือดอุดหลอดเลือดดำและหลุดไปที่หัวใจและหลอดเลือดแดงปอด ผู้ป่วยได้รับการผ่าตัดฉุกเฉินเนื่องจากลิ่มเลือดหลุดผ่านเข้าไปในห้องหัวใจด้านบนซ้าย

## INTRODUCTION

Local skills and wisdoms used to alleviate illness and promote health are now widely emphasized. Traditional massage by a trained person can decrease the number of hospital visit for various common musculoskeletal problems. However, in a situation where there is a local abnormality in a part of the body, an unexpected complication may occur producing a life threatening condition.

## CASE REPORT

A 46-year-old man was admitted to Siriraj Hospital because of progressive dyspnea. He was previously healthy and worked as a motorcycle driver. Three days before admission, he asked his nephew to massage his back and leg to relieve muscle aches. After a while, he noticed swelling of his right leg and then developed sudden dyspnea. He also coughed up some blood-streak sputum. There was no fever,

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chest pain, orthopnea, nor paroxysmal dyspnea. He smoked one pack of cigarettes and drank about 200 ml of whisky a day.

Physical examination revealed a temperature of 38.0°C, a regular pulse of 100/min, respiration rate of 28/min, and blood pressure of 130/80 mmHg. He was conscious and showed no evidence of respiratory distress. The respiratory and cardiovascular systems were unremarkable. Hepatomegaly without tenderness was noted. The right leg was swollen and warm, and Homan's sign was present. Other findings were unremarkable. A complete blood count, urinalysis, and biochemistry profiles were within the normal ranges. The serum D-dimer level was 2,700 μg/L (normal < 500). There was no significant change from the chest radiograph. An inverted T-wave in $V_1$-$V_4$ and $S_1Q_3T_3$ pattern were noted on the electrocardiogram.

An initial diagnosis of deep venous thrombosis of the right leg and acute pulmonary embolism was considered. An intravenous bolus of heparin followed by maintainance infusion was given. High probability of pulmonary embolism was demonstrated by a radionuclide perfusion lung scan. Radionuclide venography also showed a deep vein thrombosis extending from the right femoral, popliteal, to the upper part of the calf veins. Echocardiography was performed in order to evaluate the right-sided pressure and incidentally revealed a long and mobile thrombus in the right atrium which penetrated into the left atrium via a patent foramen ovale (PFO) (Figures 1- 5).

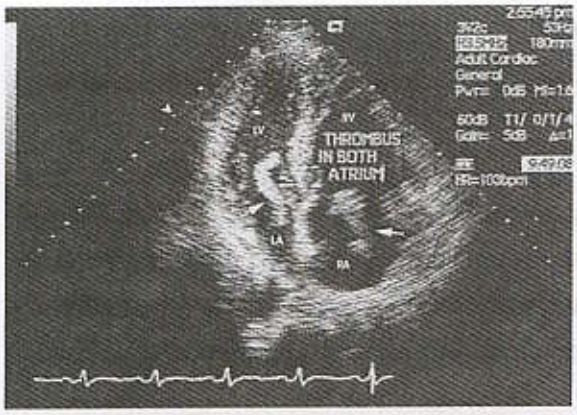



*Figure 1.* Transthoracic echocardiogram demonstrates thrombus in both right and left atria (arrows).

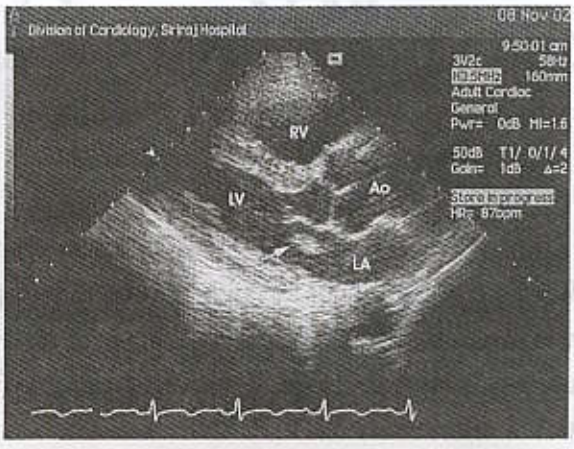



*Figure 2.* Transthoracic echocardiogram demonstrates thrombus in left atrium (arrow).

Because the possibility of further pulmonary and systemic embolization is very high if treated with anticoagulants alone or in combination with thrombolytic agents, emergency surgical embolectomy was arranged. The patient underwent atrial embolectomy through the median sternal splitting incision and under normothermic cardiopulmonary bypass with cardioplegic cardiac arrest. The right atrium was opened and a worm-like soft thrombus about 11 cm by 4 mm in diameter entrapped in the patent foramen ovale was seen. A septotomy incision was made at the PFO to enlarge the opening and the thrombus was removed. The PFO and right atrium were repaired directly with Proline 40. After opera-

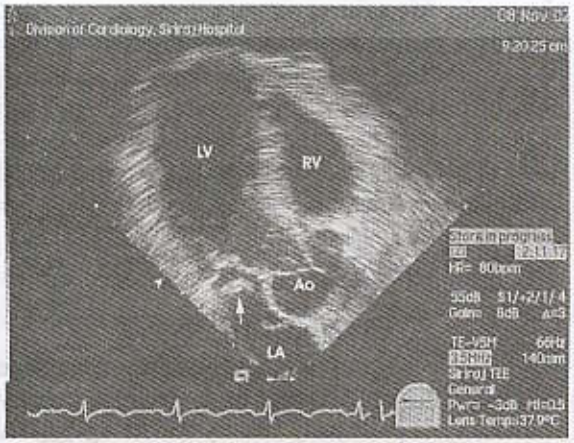



*Figure 3.* Transesophageal echocardiogram demonstrates thrombus attached to interatrial septum (arrow).

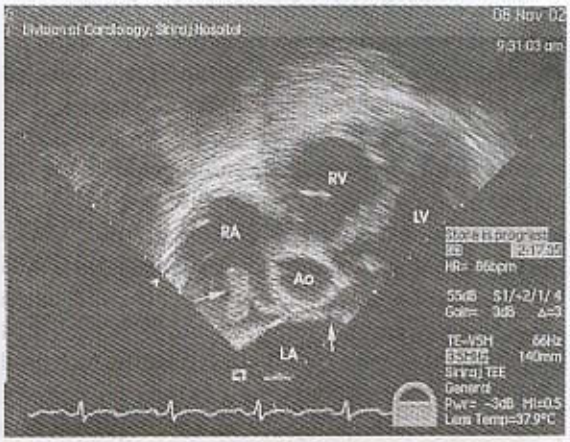



*Figure 4.* Transesophageal echocardiogram demonstrates thrombus in left and right atria through the foramen ovale of interatrial septum (arrows).

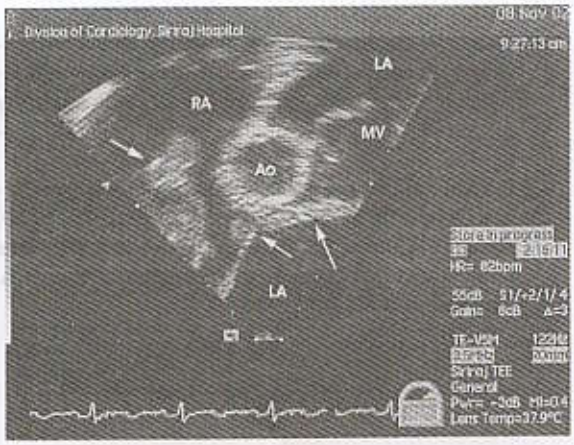



*Figure 5.* Magnified view of transesophageal echocardiogram demonstrates thrombus in left and right atria through the foramen ovale of interatrial septum (arrows).

tion, the hospital course was uneventful and he was discharged from hospital after 11 days. The initial hepatomegaly resolved indicating that it might have resulted from acute right-sided heart failure at first presentation. Oral warfarin was continued and his exercise tolerance gradually improved. The search for hypercoaggulability state revealed only an increment in fasting serum homocystene level (24.94 µmol/L, normal 5-15).

## DISCUSSION

The pathogenesis of deep venous thrombosis (DVT) arises from Virchow's triad as follows: hypercoagulability, stasis, and injury to the vessel wall.[1] In this patient, a deep venous thrombosis might have developed silently because of the hyperhomocystenemia. But local manipulation by inadvertent massage might have resulted in the clot dislodging and propagating to the heart and pulmonary arteries.

Echocardiography, which is a non-invasive investigation and can be performed at bedside, is beneficial for patients with suspected acute pulmo-

nary embolism (PE). Supportive evidences for pulmonary embolism, exclusion of other conditions, and evaluation of left and right ventricular functions are the three main purposes of the procedure.[2-4] The incidental finding of unstable interatrial thrombus led to a different management plan for this patient.

Massive PE as defined by the association with systemic hypotension, cardiogenic shock, or cardiac arrest, results in a mortality rate of 14, 23, and 60-90% respectively.[5] The prognosis depends on the extent of hemodynamic abnormalities and previous cardiopulmonary function. The indication for pulmonary embolectomy in acute PE is persistent and refractory hemodynamics despite maximal resuscitation. There used to be a tendency to perform pulmonary embolectomy in a borderline patient who has anatomically extensive PE with moderate to severe right ventricular dysfunction despite preserved hemodynamics.[6]

The prevalence of DVT and PE was previously believed to be very low in Thais. But this may not be true at present. The prevalence of Siriraj Hospital's medical patients diagnosed with PE with or without DVT during the year 2001-2002 was about 0.2 per 100 admissions. This may be the result of a change in lifestyle or increased awareness and diagnostic facilities available to doctors.

Finally, the issue of unexpected complications of traditional massage should not discourage its place as our proud Thai wisdom. Proper evaluation and contraindication to massage are vital issues that should be communicated by health personnel to increase public awareness.

## CONCLUSION

An inadvertent complication of massage resulted in the development of an acute pulmonary embolism in a previously healthy middle-age man is reported. Emergency embolectomy was performed due to the demonstration of interatrial thrombus by echocardiography. The hospital course was uneventful and the patient could subsequently resume his usual daily activities. Public education to avoid the risk of this event should be a priority.

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