Pulmonary thromboembolism after spinal instrumentation surgery

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Abstract: A 57-year-old woman was hospitalized because of gait disturbance and dysuria. Close examination revealed a cauda equina tumor at the level of L2 and L3. Tumor resection was performed, with posterolateral fusion and spinal instrumentation. On the eleventh day after the surgery, she experienced dyspnea and chest pain during standing and walking exercise. Pulmonary thromboembolism was diagnosed, based on: (1) blood gas analysis findings of hypoxemia and (2) defective images in both of the upper lobes on urgent pulmonary blood flow scintigram. Her clinical status improved with urgent thrombolytic therapy (with tisokinase and urokinase) and anticoagulation therapy (with heparin and warfarin), and her life was saved. When pulmonary thromboembolism occurs, early diagnosis by pulmonary blood flow scintigram and early thrombolytic and anticoagulative therapies are necessary. Special attention should be paid to symptoms of pulmonary thromboembolism in patients after spinal surgery.

Key words: pulmonary thromboembolism, complication, spinal instrumentation

Introduction

In the 13 years since the establishment of our hospital in May 1984, orthopedic surgical procedures have been performed in 5674 patients, including 577 patients who had spinal surgery. The only death due to complication by pulmonary thromboembolism in the 5674 patients who had orthopedic surgical procedures occurred in a patient who had undergone acetalubar transpositional osteotomy. Definitive diagnosis in that patient was given by necropsy. We experienced one patient with spinal surgery who developed pulmonary thromboembolism 11 days after spinal instrumentation surgery. With aggressive medical management the patient recovered without sequelae. We report the clinical progress and therapeutic problems involved in the postoperative management of this patient.

Case report

The patient was a 57-year-old woman who was admitted with gait disturbance and dysuria. She was 157cm tall and her body weight was 60kg. The gait disturbance appeared in August 1996, and dysuria was noted from December of that year. She was referred to our department in January 1997.

Neurological examination demonstrated sensory disturbance below the knees and motor weakness of the left lower leg. Urodynamic examination revealed impairment of bladder function. Preoperative electrocardiogram (ECG) record and respiratory examination were normal.

Anteroposterior radiography of the lumbar spine showed disappearance of the pedicle shadow at L3. Lateral radiography showed scalloping of L2 and L3 (Fig. 1). Gadolinium-diethylenetriamine penta-acetic acid enhanced magnetic resonance image (MRI) showed a tumor lesion occupying most of the dural canal (Fig. 2).

After laminectomy from L2 to L4, adhesion of the dura and tumor capsule was found, so the contents of the tumor were resected using an ultrasonic surgical aspirator. The tumor resection also required violation of the facet joints between L2 and L3, and the resultant instability necessitated simultaneous posterolateral fusion between L1 and L5, using the ISOLA system (Acromed, Cleveland, OH, USA). The surgery lasted for 545min. Blood loss of 1800cc was replaced by autologous blood transfusion of 1711cc. Pathological diagnosis of the tumor was neurinoma, Antoni type A.
The patient started moving by wheelchair, while wearing a soft brace, from the seventh day after surgery. On the eleventh day, she experienced dyspnea and chest pain during standing and walking exercise. Blood gas analysis showed hypoxemia, with PaO$_2$ of 55.3 mmHg and O$_2$Sat of 91.8%. Urgent pulmonary blood flow scintigram showed multiple perfusion defects (Fig. 3), and ultrasound examination showed thrombus within the right ventricle. Coagulated fibrinolytic examination revealed a marked elevation fibrin/fibrinogen degradation products and D-dimer, to 160 μg/ml and 79.6 μg/ml, respectively. Thus, pulmonary thromboembolism was diagnosed, and thrombolytic therapy, with 14400000 units of tissue plasminogen activator (tisokinase) and 480000 units of urokinase, was initiated and continued for 3 days. This was followed by anti-coagulation therapy, with 12000 units of heparin for 10 days and 5 mg of warfarin for 3 days, resulting in