

Case Report

Paraplegia after Thoracotomy for Division and Suture Patent Ductus Arteriosus (PDA)

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A Thai woman, aged 22 years old, came to hospital with Patent Ductus Arteriosus (PDA). Left thoracotomy, with division and suturing PDA, was performed. The second day after operation, she developed paraplegia below umbilical level. The CT-scan detected an extradural hematoma in the spinal cavity from T3-T6. To remove the blood clot, the T spine laminectomy was performed. 6 months after the laminectomy, the patient was able to perform her regular exercise.

Keywords: Paraplegia, Thoracotomy, PDA

J Med Assoc Thai 2006; 89 (12): 2142-4

Full text. e-Journal: <http://www.medassocthai.org/journal>

A single Thai female student, aged 22 years old, from a hospital in Gumpangpeth province came to Naresuan University Hospital without a previous medical record. She visited the hospital due to ease of energy loss (Fc II-III), and reported having symptoms of being easily exhausted and lack of energy especially when exercising (Fc II) for approximately eight months before coming to the hospital. Important medical examinations detected were continuous murmur at LPSB (left parasternal boarder) with LV (left ventricle) heave, PMI (point maximum impulse) at the 6th ICS (intercostals space) showing 2 cm from MCL (mid-clavicular line), sinus rhythm via EKG, and LVH (left ventricular hypertrophy) with repolarization abnormality. An echocardiography also displayed PDA of 1 cm, PG of 51.8 mmHg, L to R shunt, PAP (pulmonary artery pressure) 70/40 mmHg, LV dilated (LV_{esd} 44 mm) and EF (ejection fraction) of 56%.

By operation finding, the patient was discovered to have a patent ductus arteriosus (PDA) of 1 cm in width and 0.5 cm in length. The division and suture PDA by prolene 5-0 was performed from her left posterolateral thoracotomy (4th ICS) with muscle

sparing for a total operative time of 125 min. However, it was bleeding from the intercostal artery at the medial side of incision so electrical cauterization and oxidised cellulose packing was used to stop the bleeding.

The patient was able to move arms and legs normally on the first day after the operation. Nonetheless, starting from her second day after the operation, the patient's body ranging from umbilical level to both legs started to be weak and weaker each day (motor grade III-IV/V). A CT scan for T spine was then performed and it detected an extradural hematoma in the spinal cavity causing a mass effect on the spinal cord and a shift of the spinal cord to the right anterolateral. A lesion was also seen from T3 to T6 levels.

Consequently, another operation was required to relieve the patient's consequences from the PDA incision. Laminectomy of the T spine was carried out to remove the blood clot. The patient reported relief from her lack of movement energy, particularly from her legs. Six months after the operation, the patient was able to perform regular exercise.

Literature review

From literature review, although there is multiple reasons potential for paraplegia causes after any

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Table 1. Post thoracotomy paraplegia⁽¹⁻⁸⁾

Author	Year	Diagnosis	Operation	Neulogenic level loss	Outcome
Ahengar et al	2002	Tuberculous empyema	Decortication	T6-T7	Not improved
		Bronchogenic carcinoma	LLL lobectomy	T6-T7	Not improved
		PDA	Ligation	T6-T7	Not improved
Attar et al	1995	Bronchogenic carcinoma	Lt.pneumonectomy	T6-T7	Not improved
		Tuberculous empyema	Decortication	T5	Not improved
		Bronchogenic carcinoma	LUL lobectomy	T6-T7	Not improved
		Bronchogenic carcinoma	LLL lobectomy	T6-T7	Improved
		Pulmonary tuberculosis	LUL lobectomy	T6-T7	Not improved
Weda et al	1993	Tuberculous empyema	Decortication	T6-T7	Not improved
		Stab wound	Control bleeding	T6-T7	Not improved
Short	1990	Bronchogenic carcinoma	RUL lobectomy	T5	Improved
		Bronchogenic carcinoma	RUL+RML lobectomy	T5-T6	Improved
Johr&Salathe	1988	Bronchogenic carcinoma	RLL lobectomy	T5-T6	Not improved
		Bronchogenic carcinoma	RUL lobectomy	T5	Died
Tashiro et al	1987	Bronchogenic carcinoma	Lt.pneumonectomy	T5-T6	Died
Nancekivell	1985	Bronchogenic carcinoma	RUL lobectomy	T5	Not improved
Merlier&Thevenet	1980	Pulmonary tuberculosis	Rt.pneumonectomy	T5	Not improved
Mathew&John	1970	bronchiectasis	thoracoplasty	T6-T7	Not improved
			Lt.pneumonectomy	T4	Improved

posterolateral thoracotomy operations, the reported cases of paraplegia after operations are generally rare. The main reasons for paraplegia are (i) a spinal cord injury due to an improper incision position; (ii) an attempt to stop bleeding via costovertebral angle through electrocautery or via the wound packing by oxidized cellulose method; and (iii) hypotension and/or bleeding during operation. Another paraplegia cause may be related to a professional connecting technique for intercostal vessels. Nevertheless, if paraplegia happens, the symptoms tend to be severe and can sometimes be life threatening.

Discussion

According to the case and literature review, the major issue from posterolateral thoracotomy is the bleeding from the 4th intercostal artery on the medial side. The bleeding from intercostals artery was stagnant in the spinal foramen. It also compressed the spinal cord. Therefore, the patient developed paraplegia in both legs. Both the electrical cauterization and oxidized cellulose techniques that are used for bleeding prevention are potentially involved in the paraplegia effect after the operation.

Meanwhile a paraplegia incident after any thoracotomy incision is rare. The paraplegia is commonly found in patients who, during operation, were

bleeding from the medial side of the intercostal artery with the bleeding prevented using the electrical cauterization or oxidized cellulose techniques. Therefore, a better resolution must be carefully analyzed and resolved to minimize the patient's undesired results such as paraplegia.

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ภาวะแทรกซ้อนที่มีเลือดออกในช่องกระดูกสันหลังภายหลังการรักษา patent ductus arteriosus:
รายงานผู้ป่วย 1 ราย

จรัญ สายะสถิตย์, นราพร สมบูรณ์นะ, จุล นำชัยศิริ

รายงานผู้ป่วยหญิงไทยอายุ 22 ปี ซึ่งเป็นโรคหัวใจพิการแต่กำเนิดชนิด patent ductus arteriosus ได้รับการผ่าตัดรักษา thoracotomy ด้านซ้ายเพื่อผ่าตัดและผูก PDA หลังผ่าตัด 48 ชั่วโมงเกิดชาและอ่อนแรงตั้งแต่ระดับสะเอวลงไป CT-scan แสดงก้อนเลือดในช่อง extradural ตั้งแต่ระดับ T3-T6 จึงได้ทำการผ่าตัด laminectomy และนำก้อนเลือดนั้นออก หลังผ่าตัด 6 เดือนผู้ป่วยสามารถกลับไปทำงานได้ตามปกติ