Case Report

Left Upper Lobectomy after CABG with the Left Internal Mammary Artery Graft

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Left upper lobectomy in a patient with a history of Left Internal Mammary Artery (LIMA) graft for Coronary Artery Bypass Graft surgery (CABG) is a challenge for the surgical team. The adhesion formation in the left chest, especially around the left internal mammary artery graft, may cause difficulty for surgery. The injury of LIMA during dissection may lead to serious acute myocardial ischemia and cardiac arrest. The authors reported a case of successful operation after receiving both good surgical and anesthetic plan prior to surgery.

Keywords: *Left upper lobectomy, Left internal mammary artery graft*

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Left upper lobectomy after the previous Coronary Artery Bypass Graft surgery (CABG) with Left Internal Mammary Artery (LIMA) graft is an extraordinary and rare case. The adhesion formation in the left chest, especially around the left upper lobe, would cause myocardial ischemia. There have been only two reports since 1993[1,2]. The difficulty of surgery that had been similarly reported was the separation of LIMA from lung parenchyma under adhesion. Halkos ME, et al reported the way they resected the tumor by dissecting the lung parenchyma around the LIMA. He had used this technique in five previous patients without complication[2]. Both reports mentioned only the surgical technique. However, a successful operation is usually derived from good cooperation among the surgical team and previous plans. The authors reported the successful surgical and anesthesia management in a 60-year-old man who underwent coronary artery bypass grafting three years ago, and included an in situ LIMA graft to the Left Anterior Descending coronary artery (LAD), two saphenous vein grafts from the ascending aorta to posterolateral coronary and obtuse marginal arteries. He presented with reticulopathy opacity at the apex of the left lung. Computed tomography revealed a 3.2 x 2.7 cm speculated lobulated mass in the apicoposterior segment of the left lung, which was favorable to cancer.

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Surgical Management

The great concern was how to avoid injury to the LIMA. Right lateral decubitus with partially supine abdomen position was planned in order to expose the left groin in case of serious cardiovascular event so that CardioPulmonary Bypass (CPB) could be immediately established. External defibrillator was prepared in order to correct possible ventricular fibrillation if the LIMA was accidentally injured. Coronary perfusion catheter was also prepared for perfusion distal LIMA, using the blood from the ascending aortic canulation, if LIMA injury had occurred. Discussion of intraoperative plan with the anesthesiologist and perfusionist is quite important. After left thoracotomy, careful analysis adhesion in order to identify LIMA and attempt to remove the left upper lobe were highly concerned.

Anesthetic Management

Preoperative evaluation

The most concern was the patient's cardiovascular reserve, whether his myocardium could tolerate surgical stress and a decrease in postoperative pulmonary reserve. Thus, physical activity was

revealed and showed he was fit. Echocardiography showed good left ventricular function. Pulmonary function test was normal test with 94% FEV1 and 88% FVC of predicted values. Additionally, preparations for underlying diseases, routine laboratory investigation and reservation for blood products were accomplished under standard practice.

Intraoperative consideration

Since the operation was performed on the right lateral position, a 16-G catheter was canulated at a superficial vein of the right hand. Also, there was a 20-G catheter at the right radial artery. Right subclavian vein was canulated with a long single lumen catheter (Cavafix). Both arterial and central lines were settled in order for possible CPB. Similarly, both esophageal and rectal temperature probes were monitored. Other monitors included NIBP, SpO2, EKG, ETCO2 and urine output.

General anesthesia would be the best choice. The combination with epidural anesthesia or analgesia for postoperative pain would be used. However, there could be a problem of catheter taping on the back as it was necessary to keep two areas clear for the external defibrillator pads, the sternum and the 4-7th thoracic left-lateral dermatome. Thus, only general anesthesia was performed with a double lumen tube (Bronchocath 37 Fr, left sided). The anesthesiologist great responsibility was to prepare the lungs. The left lung was completely deflated and the right lung had to retain good ventilation during the operation. Potential ventilation problems such as lung retractions had to be prevented. With the left lung deflated, it can provide clear and easy dissection the left upper lobe from LIMA. Heparin sulfate was prepared in case of unexpected LIMAdissection and the need to use CPB. Anesthetics were used as appropriate for postoperative extubation unless there was no serious cardiovascular accident. Postoperative ICU stay was also planned.

Intra and postoperative events

The left lung was completely deflated. Standard left posterolateral thoracotomy was made. Dense adhesion around the left upper lobe was carefully separated from the posterior aspect and apex to the anterior aspect of the left upper lobe. Left upper lobe mass at the apicoposterior segment with adherence to the superior segment of the left upper lobe was identified. The attempt to find LIMA was done by identifying the descending aorta and left subclavian artery. The anterior segment of the left upper lobe was around LIMA. So the adjacent lung parenchyma was dissected under direct vision with cautery down to pericardium and anterior to the phrenic nerve. Linear stapler was used at the superior segment of the lower lobe that adhered the tumor mass. The pulmonary artery and vein were then identified, and ligated with silk 2/0 and sutured with prolene 4/0. The left upper lobe bronchus was stapled and cut. The left upper lobe was removed en bloc. Drains were placed. Intercostal nerves were blocked with 0.25% marcaine 10 mL. No serious event occurred. All vital signs were within normal limits.

The patient was extubated in the operating room and received oxygen therapy via mask overnight. He recovered well without any complication. Drains were removed in two days. The left lung had full expansion without residual effusion stated by chest x ray. Pathologic report showed pleomorphic carcinoma with free resected margin. Seven peribronchial nodes were negative. The patient was discharged from the hospital on the fifth postoperative day.

References

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การผ่าตัดกลีบปอดซ้ายบน ในผู้ป่วยที่เคยได้รับการต่อเส้นเลือดโคโรนารีด้วยเส้นเลือดแดง Left internal mammary

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การผ่าตัดกลีบปอดซ้ายบน ในผู้ป่วยที่ได้รับการต่อเส้นเลือดหัวใจด้วยเส้นเลือดแดง left internal mammary เป็นสิ่งที่ท้าท้ายสำหรับทีมงานศัลยกรรมซึ่งประกอบด้วย ศัลยแพทย์ วิสัญญีแพทย์ และพยาบาลส่งเครื่องมือ สิ่งที่ต้องคำนึงถึงคือการเลาะเนื้อปอดซึ่งมักมีพังผืดยึดติดกับเส้นเลือดแดง left internal mammary จากการผ่าตัดต่อเส้นเลือดหัวใจ และหากเส้นเลือดแดง left internal mammary ถูกเลาะจนขาด อาจทำให้ผู้ป่วยมีอาการหัวใจขาดเลือดทันทีและหยุดเต้นได้ ผู้เขียนได้รายงานผู้ป่วยหนึ่งรายที่ได้รับการผ่าตัดโดยมีการวางแผนทั้งการผ่าตัด และการระงับความรู้สึกจนการผ่าตัดประสบผลสำเร็จและเกิดความปลอดภัยแก่ผู้ป่วย