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| Importance of follow-up inspection after pulmonary angioplastic procedures for lung cancer surgery. | 肺癌手術後の肺動脈形成手術の後療法の重要性についてのインスペクションの必要性。
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EDITORIAL

Importance of follow-up inspection after pulmonary angioplastic procedures for lung cancer surgery

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This editorial refers to the article by Yamashita et al. of General Thoracic and Cardiovascular Surgery.

In cases of lung cancer invading the pulmonary artery (PA), PA reconstruction with or without bronchoplasty has several advantages over pneumonectomy, including preservation of lung function and lower morbidity and mortality. I read with interest the article by Yamashita and colleagues who performed PA reconstruction for lung cancer surgery in 25 cases. As the authors suggest, I agree that pulmonary angioplasty procedure is a safe and acceptable alternative to pneumonectomy in lung cancer patients. Therefore, detailed study of the techniques and the indications for each case are indispensable for the surgeon. However, there are some aspects of the results that raise some issues and require further consideration.

First, the authors note that the reason for performing PA plasty in all 25 cases was
related to invasion from the primary tumors (14 cases) or lymph nodes (11 cases). However, they performed PA plasty with bronchoplasty (double plasty) in only 6 cases.

In lung cancer surgery, we sometimes must determine how to manage pulmonary angioplastic procedures in cases with tumor or bulky hilar lymph node invasion. Pulmonary angioplasty without bronchoplasty is performed less often than double plasty, because the lung cancer occurs from the lung parenchyma or bronchial wall. Rendina et al. reported 52 PA reconstruction for lung cancer associated with 33 bronchial sleeve resections, and in less than 30% of all PA reconstruction cases was PA plasty alone indicated\(^1\). In our institute over the past 20 years, PA plasty alone was performed in 31% of all PA reconstructions. Therefore, the question remains as to the indication for PA plasty alone in this article. Though it is sometimes difficult to distinguish cancer-related invasion from benign adhesions during surgery, we often treat cases with fibrous adhesions after chemoradiotherapy or calcified hilar lymph nodes with obstructive lung disease, which poses some difficulty in direct dissection of the PA segmental branch. In most of these cases, we do not chose circumferential or wedge PA resection, but use small tangential resection and side-to-side suture. Of course, such cases should not be called PA plasty for lung cancer, since there is no cancer-related invasion.

Second, the authors preferred the technique of deep wedge resection of the PA and a proximal-end-to-distal-end anastomosis to avoid stenotic change after primary side-to-side suturing of the PA. In double plasty, bronchial reconstruction brings the anastomotic end of the pulmonary artery closer and avoids kinking or angulation after end-to-end anastomosis. However, in cases of PA plasty alone, end-to-end anastomosis for wedge resection is sometimes not feasible because of the lack of this shortening
effect of double plasty. The anastomotic shape after reconstruction of PA wedge plasty often proves to be disappointing. The authors reported that reconstruction of the length of the wedge-resected part of the PA within 3 cm did not cause any kinking or stricture. However, I believe that the way to avoid kinking after wedge resection of the PA is to cut the tangential direction as short as possible and to cut the vertical direction as deep as possible. For cases of extended longitudinal defects in which end-to-end anastomosis is not feasible, I would encourage the use of patch reconstruction.

Third, the authors did not routinely conduct follow-up inspections of the PA and bronchial anastomosis. I would emphasize that follow-up inspection of the anastomosis after PA or bronchial reconstruction is essential for the surgeon to improve and provide feedback related to surgical techniques. Instead of conventional PA angiograms, recent advances in multi-row detector computed tomography (CT) enable clear 3-D visualization of even small kinking or angulation of the anastomosis site without any invasiveness. For bronchial anastomosis, I routinely use a conventional flexible bronchoscope to inspect the site within 2 weeks after operation, though virtual endoscopy may take the place of conventional flexible bronchoscopy in the near future.

Finally, I believe that pulmonary angioplastic procedures for lung cancer have expanded the surgical indications for marginal patients with low pulmonary function and improve patients’ quality of life by avoiding pneumonectomy. Therefore, it is important to continuously study this special technique while sharing information.

Reference