Is “en masse” lobectomy feasible in the recent era?

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Kamiyoshihara et al. reported twelve cases of “en masse” lobectomy using VATS technique in this Journal (GTCS). Simultaneous ligation or stapling of hilum configuring by pulmonary vessels and bronchi is not a new technique, but old. This technique is also called “en masse” or tourniquet lobectomy. Gluck reported pulmonary resection by “en masse” ligation technique in animal models [1], and Babcock showed the anatomical lung resection by individual hilar ligation technique in 1908 [2]. Since Blades and Kent reported the isolation-ligation technique in American Association for Thoracic Surgery annual meeting [3], individual ligations of vessels and bronchi were accepted for standard procedure of lobectomy and declined “en masse” lobectomy. Historically, Gaskin et al. [4] reported pneumonectomy by “en masse” stapling of hilar vessels in 1975. Furthermore, Lewis et al. [5] showed the simultaneously stapled lobectomy by video-assisted thoracic surgery (VATS) and no complications related to this technique. However, these “en masse” lobectomy were not widespread because surgeons assumed high incidence of bronchopleural fistulas (BPF) regardless of lack of apparent evidence.

On the basis of these backgrounds, we have several questions for “en masse” lobectomy. The first, can this

technique be applied for the infectious disease? In the past several decades, diseases from infections such as refractory tuberculosis or bronchiectasis were good indications of surgical intervention without effective antibiotics. However, mortality rates were quite high due to BPF even if the isolation-ligation technique was applied [3]. BPF was underlined to lead to the maximum risk of mortality, particularly, in patients with antituberculous drug-resistant tuberculous bacilli. In the recent era, the risk of BPF was decreased because of adequate patients’ selection or improved perioperative management of patients, as follows: improved anesthetic procedures including double-lumen endotracheal tube, well-understanding of chest physiology, and available sensitive antibiotics with wide spectrum. Of course, one of the reasons of diminishing BPF after lung dissection was due to the underlying disease which was changed from the infections to non-infected disease such as carcinomas. Although most of the surgeons tend to think that this improvement was due to the isolation-ligation technique resulting clean resections of lung, it should be understood that these anatomical lung resection improved supportive modalities benefit to the surgeon. Nevertheless, infected disease of the lung remains still a risk factor of BPF in spite of the low incidences compared with the previous results. Since infected bronchi, such as chronic bronchitis, were closed with pulmonary vessels by this technique, the risk of BPF may be increased compared to the individual ligation technique. This logic may be the speculation because there were no randomized controlled trials comparing between two methods.

The second question is if this technique was applicable to the lung cancer surgery or not? Although the author in the current study recommended the application of this technique to the patients without evidence of hilar node involvement, most of these patients may not be difficult

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cases for hilar dissection and individual ligation. Therefore, individual vessels and bronchi should be dissected and closed. On the basis of the oncological principles, hilar and mediastinal nodes or lymphatics should be dissected and completely extirpated. “En masse” lobectomy may be contradictory to this strategy for cure of cancer. In the previous report, bronchial stumps could be kept on averaged 4 mm distance and comparable to the distance by anatomical hilar dissection [6]. In addition, none of 214 patients operated “en masse” lobectomy did not show any locoregional recurrences even if the hilar nodes were involved. However, the limitations of this report were relative short follow-up periods and bias of patients selection which consisted of only ten patients of N1 and 4 of N2. Therefore, it should not be concluded that this technique can secure the oncological effect and may be premature.

The third question is the application to the emergency cases including accidental bleeding during standard operation and thoracic trauma. We have experienced “en masse” lobectomy with vascular clump in the case of uncontrollable intraoperating bleeding. However, vessels and bronchi were individually ligated after extirpation of lung to prevent BPF. “En masse” lobectomy may be the best option for blunt trauma for control of bleeding.

The fourth question is feasibility of “en masse” stapling of hilar vessels separated from bronchi. Gaskin et al. [4] reported this technique for pneumonectomy, and we applied this technique to the several patients with lung cancer for right upper lobectomy after hilar nodes dissection and stapling of right upper bronchus. This technique

may minimize the potential risk of BPF and it may contribute the cost benefit due to reducing the frequent use of staplers. The author in the current study reported only one case of “en masse” stapling of hilar vessels on emergency of trauma which may be a reasonable application.

Finally, enlarged hilar nodes, central bulky tumor, edematous, infected, and fibrotic bronchi caused by infected disease should be avoided from this technique. However, this technique may be one of the options excuse to prevent fatal problems under advanced technology and well-managed modality treatment. Surgeons should always keep the potential risk of BPF due to this technique in their mind.

References

1. Gluck T. Experimenteller Beitrag zur Frage der Lungenextirpation. *Berl. Klin Wochenschr.* 1881;18:645.
2. Babcock WW. The operative treatment of pulmonary tuberculosis. *JAMA.* 1908;50:1263–5.
3. Blades B, Kent E. Individual ligation technique for lower lobe lobectomy. *J Thorac Cardiovasc Surg.* 1940;10:84–101.
4. Gaskin RJ, Bergmann M. Pneumonectomy by “en masse” stapling of hilar vessels. *Ann Thorac Surg.* 1975;19:242–7.
5. Lewis RJ. Simultaneously stapled lobectomy: a safe technique for video-assisted thoracic surgery. *J Thorac Cardiovasc Surg.* 1995; 109:619–25.
6. Lewis RJ, Caccavale RJ, Bocage JP, Widmann MD. Video-assisted thoracic surgical non-rib spreading simultaneously stapled lobectomy: a more patient-friendly oncologic resection. *Chest.* 1999;116:1119–24.