

The Validity of Tracheal Surgery for the Aged

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Surgery for tracheal stenotic lesions in older patients over age 70 was evaluated in comparison with younger patients under age 69 on the basis of our clinical experience.

The causes of tracheal lesions were mainly malignant diseases in spite of varying variety of etiology in the younger patients. The outcome of surgical treatment in the older ones was not inferior to that in the younger ones as far as post-operative complications were prevented.

In conclusion, it is emphasized that the surgical treatment of choice is essential for palliation of symptoms and expectance of high quality of life.

Introduction

Tracheobronchial lesions often result in a life-threatening lethal outcome. Great strides in the treatment of tracheobronchial lesions have been achieved with advances in thoracic surgery. It is more significant recently that life expectancy is increasing, in particular, in the sixth and seventh decades. According to elongation of life expectancy, the surgical indications for tracheobronchial lesions have been extended to serious cases to save life.

Even in the aged patients with severe respiratory distress, the indication of tracheoplastic surgery has been extended at the advent of various kinds of medical instruments to support surgical management. In fact, these contribution helps promote surgical success and eliminate of patient's complaints.

The purpose of this study is to clarify the value of tracheoplastic surgery for the aged in comparison with those of patients under 70 years of age.

Patients

During the past 10 years from January 1982 to December 1991, 59 patients underwent surgery for tracheobronchial lesions, in whom 10 were older than 70 years and the remaining 49 were under 69 of age.

Table 1 shows the initial symptoms of dyspnea, dysphagia, tumor mass in the neck, cough, sputum and hemoptysis, comparing patients between under 69 and over 70 years of age. There was no significant difference between the two groups. The pathogenesis of tracheal lesions were compared between the two groups as shown in Table 2. The etiology of lesions was variable in patients under 69 years of age. The causes of tracheal stenosis were varied, including congenital anomaly, traumatic rupture, inflammatory lesions and iatrogenic disorder of irradiation damage. In contrast, malignant diseases were the main cause of tracheal stenosis in patients over 70 years of age.

In this series, the lesions in which surgery was indicated were caused in the following order: thyroid cancer, primary malignant tumors of the trachea, lung and esophageal cancers.

The operative procedures used commonly in this series were an end-to-end anastomosis and terminal tracheostomy (Grillo) as indicated in Table 3. There was no difference between patients under 69 and over 70 years of age. Patch-plasty with pericardium was applied for the defect after a limited resection. In a case with cystic adenoid carcinoma, a wide resection of 14 tracheal rings was required for ensuring a free cut margin from the tumor. As a result, reconstruction necessitated using artificial graft (Neville). In the early course of post-operation, the air way was satisfactorily maintained without any respiratory distress. However, catastrophic event of tracheoarterial fistula evolved between the right carotid artery and the proximal tracheal anastomosis and it forced him to suffocate suddenly and to expire on day 27. Surgeons should be aware of a safe limit of resection length to apply an end-to-end anastomosis for tracheal reconstruction.

Table 4 revealed the postoperative complications in comparison with patients between age groups under 69 and over 70. High mortality rates were seen in older patients as compared with younger patients. The incidences of the other complications including pulmonary complications were not so significantly different that this surgical procedure should be indicated even in older patients, if necessary. In the 10 patients over 70 years of age, the

Table 1 Patients' ages and symptoms

	over 70	under 69	Total
Dyspnea and stridor	6 (60)	20 (40.8)	26
Neck tumor	1 (10)	5 (10.2)	6
Bloody sputum	0	8 (16.3)	8
Cough and sputum	1 (10)	11 (22.4)	12
dysphagia	2 (20)	5 (10.2)	7
Total	10	49	59

(%)

Table 2 Etiology in relation to age

Age	over 70	under 69	Total
Post-tracheostomy	1	3	4
Traumatic rupture	0	4	4
Congenital	0	1	1
Inflammatory	0	6	6
Radiation	0	1	1
Thyroid cancer	5	10	15
Tracheal tumor	1	12	13
Lung cancer	1	8	9
Esophageal cancer	2	4	6
Total	10	49	59

Table 3 Operative procedures associated with age

Age	over 70	under 69	Total
Endo-to-end anastomosis	7	16	23
Terminal tracheostomy(Grillo)	2	8	10
Patch-plasty	0	5	5
Artificial graft	0	1	1
Skin-flap	0	1	1
Anastomosis	0	4	4
Carinoplasty	1	7	8
Sleeve or wedge pneumonectomy	0	7	7
Total	10	49	59

Table 4 Postoperative complication related to age

Postoperative complication	over 70 (N=30)	under 69 (N=119)
Operative mortality	5 (16.7)	4 (4.4)
Hospital mortality	2 (6.7)	5 (4.2)
Anastomotic stenosis	0	3 (2.5)
Anastomotic dehiscence	3 (10.0)	3 (2.5)
Sputum retention	1 (3.3)	6 (5.0)
Atelectasis	3 (10.0)	5 (4.2)
Pneumonia	3 (10.0)	2 (1.7)
Broncho-Pulm-art fistula	0	2 (1.7)

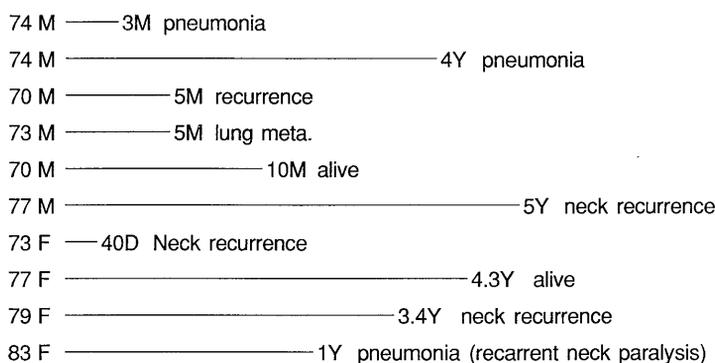


Fig.1 Surgical outcome

surgical outcomes are indicated in Fig 1. The results showed a relatively fair prognosis except for local recurrence of thyroid cancers which demonstrate the fact carcinomas of the thyroid in older patients tended to transform from papillary and/or follicular adenocarcinomas to undifferentiated one in a short postoperative period and also relate to deaths due to aggressive growth of recurrent cancers.

Postoperative complications occurred almost similarly in both groups. On the other hand, higher mortality and morbidity were revealed in the older patients rather than the younger patients. It is suggested that postoperative complications in the older patients often result in operative deaths.

Discussion

Great strides in the development of absorbable suture material as well as perioperative respiratory support have been achieved with advances in the surgical treatment of tracheobronchial lesions. Development of absorbable suture material significantly reduced the incidence of postoperative complications such as granulation at anastomosis which caused stenosis. Furthermore, HFV has been playing a key role in maintaining perioperative respiratory support safety, contributing to satisfactory accomplishment of precise operative procedures¹²⁾. However, surgery for the trachea and the bronchus in cases

of serious stenotic lesion sometimes necessitates extracorporeal circulation which is now ready and available for clinical use, whenever necessary.

Staple techniques for anastomosis have been developed with ensuring security and time-saving as well as uniform fashion of anastomosis^{3,4)}. Since tracheobronchial surgery had become prevalent in the aspect of clinical application, it was defined that a trachea-and bronchus-reconstructed lung had provided satisfactory function, eliminating ill effects based on the lesions. In accordance with increased life expectancy, highest incidence being in the sixth and seven decades, and the indication of tracheobronchial surgery has become increased.

In this series, tracheobronchial surgery for older patients over 70 years of age was clinically evaluated on the basis of the result of our clinical experience, comparing with that of patients under 69 years of age. The surgical outcome in older patients was by no means inferior to that in the younger. The causes of tracheobronchial lesions in the older patients were mainly malignancy. In contrast, those in the younger were so variable that diverse operative procedures were needed. In general, aggressive operation was applied for younger patients, including the carinoplasty and sleeve pneumonectomy.

Retention of bronchial secretion used to be not infrequently experienced following tracheobronchial surgery. It is well known mucociliary transport function is also impaired due in part to denervation⁵⁾ until on the 21 postoperative day despite structural recovery on light microscopic study⁶⁾. Based on the clinical experience with the treatment for older patients, we frequently encountered retention of bronchial secretion after surgery for older patients as the result of depressed mucociliary transport function in addition to reduced cough reflex. Another important cause of retention of bronchial secret is ischemic mucosal damage due to interruption of the bronchial artery. Restoration of bronchial blood flow demands 2 weeks or more. During the early postoperative period of 2 or 3 weeks, meticulous cares are needed to make air way clean until resuming of mucociliary transport function, in particular, in older patients.

In this series, there were no significant differences in surgical outcomes between the two groups under age 69 and over 70. The causes of tracheal lesions in younger patients were a wide variety although those in the older were mainly malignant diseases. And also the operative procedures used in younger patients were variable and complex in spite of simpler in the older. Relief of respiratory distress should be mandatory for surgery. The indication of surgical correction to the air way should not be restricted with regard to age even though it would be temporary on account of oncological radicality of

malignant diseases in older patients. Development of absorbable suture material and perioperative respiratory support by the aid of high frequency ventilation made tracheal surgery far advanced and resulted in clinical security.

This study drew a conclusion that surgery should extensively be indicated for patients with tracheal lesions to relieve and alleviate respiratory distress regardless patients ages as well as the etiology. Needless to say, it is well known that SVC syndrome is mostly caused by malignant diseases. Surgery is mandatory for palliation of impairment of arterial blood supply subsequent to venous congestion in the upper half of the body. Recent study clarified the usefulness of expandable metallic stent⁷⁾. A matter of great concern is focused on expandable stent in the field of the bile duct⁸⁾⁹⁾, the vein¹⁰⁾¹¹⁾, the artery,¹²⁾ and the bronchus¹³⁾. It is expected in the near future a wide application for elimination of luminal stenotic and obstructive syndromes to obtain the efficacy of expandable stent on relieving syndromes based on lesions. We are confident that this procedure has become a valid option of surgery for high risk patients.

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