

Simultaneous Combined Resection of Adjacent Involved Organs for Carcinoma of Thoracic Esophagus

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ABSTRACT: Ten patients with simultaneous combined resection of tumor-bearing esophagus with the trachea and/or the aorta were clinically evaluated in terms of its application and indication on the basis of a result of our clinical experience.

- 1) All the patients were in advanced disease stages with far extending nodal involvement.
- 2) Cancer recurrence at bronchial anastomosis occurred in one year after surgery. It is warned that the extent of a resection should be sufficient.
- 3) The circumferential resection of the aortic wall and replacement with artificial vascular graft were made with the aid of temporary bypass constructed in the same operation field of esophagectomy. However, there was no experience with grave complications such as postoperative infection.
- 4) The surgical outcome is not satisfactory but the necessity of proper early cares is required for keeping away from an operative death. In addition, multimodality adjuvant therapy is needed for avoidance of distant metastases.

INTRODUCTION

The thoracic esophagus lies adjacent to the aorta, trachea and left main bronchus in the mediastinum. It is anatomically characteristic of the devoid of the serosa which acts as a barrier to extension of cancerous infiltration and a help the anastomotic sites heal satisfactorily enough to avoid occurrence of anastomosis insufficiency. It is accepted that carcinoma of the thoracic esophagus is found at advanced disease stages because a symptom of dysphagia is caused by considerable narrowing of over three fourth in its lumen.

Therefore, surgery is indicated for patients with advanced cancer stage of carcinoma of the thoracic esophagus. Some have impending symptoms which threatens life. It is often experienced that surgical treatment for patients

with advanced cancers may as well be indicated to alleviate their urgent catastrophe unless oncologic curability is not necessarily ensured.

The aim of this study is to verify merits of aggressive surgery for advanced carcinoma of the thoracic esophagus on the basis of a result of the treatment for our clinical advanced cancer of the thoracic esophagus.

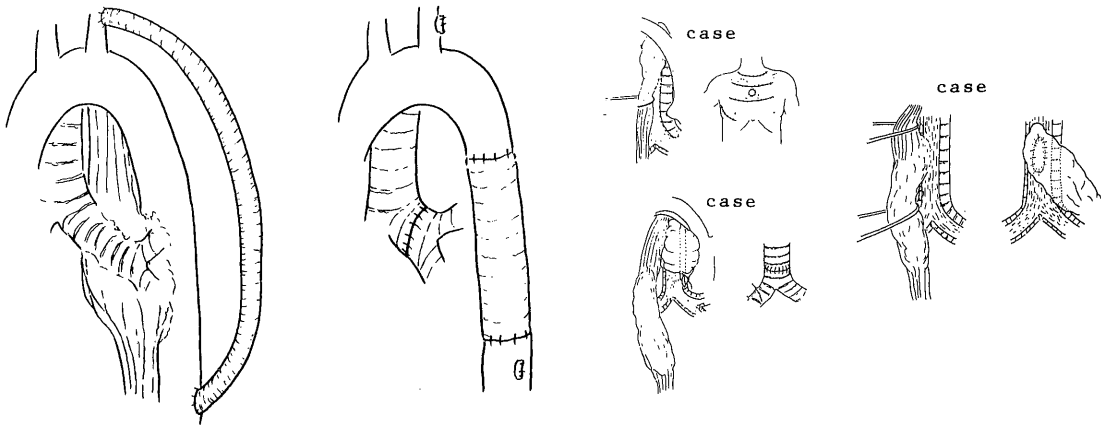
MATERIAL AND METHOD

Ten patients with a resection of carcinomas involving the aort and trachea were eligible for this study.

During past 16 years from January 1973 to December 1988 in The First Department of Surgery, Nagasaki University School of Medicine, five patients underwent resections of the trachea or main bronchus, the other 4 had resections of the wall of the aort and the

Table 1. patients with concurrent combined resection with the trachea and the aorta

case	age	sex	location	length	histology	vascular invasion	lymphnode metastasis
1	66	M	IuCe	7.5	sq well	ly+ v+	n ₂
2	68	M	IuIm	9.5	sq well	ly- v-	n ₃
3	65	M	Im	8.0	sq well	ly+ v-	n ₃
4	65	F	ImIu	9.0	sq well	ly+ v-	n ₃
5	64	M	ImIu	9.0	sq well	ly+ v+	n ₂
6	54	M	Im	6.5	sq mod.	ly+ v-	n ₄
7	58	F	Im	5.0	sq undiff.	ly+ v+	n ₄
8	53	M	IuIm	10.0	sq mod.	ly+ v-	n ₂
9	65	M	Ei	7.8	sq well	ly+ v+	n ₃
10	46	M	ImIu	10.0	sq mod.	ly+ v-	n ₄

**Fig. 1.** operative method schema regarding esophagectomy with combined resection with the aorta and the left main bronchus

remained one received the resection of both the trachea and the aorta (Fig.1). The patients comprised 8 men and 2 women whose age ranged from 53 to 68 years. The locations of the tumors were Iu Ce in one, IuIM in 5, Im in 3 and Ei in one respectively. The length of shadow defect on esophagogram showed 5.0cm to 10.0cm and the patterns of shadow defect were the serratus type in one, the funnel type in one and the spiral type in 7. The types of the lesions at endoscopy were the ulcerative one in 9 and the protrusive in one. The vascular invasion of ly(+) was seen in 9 and that of v(+) in 4 and ly(+) v(+) in 4. Nodal involvement was shown in 3 of n₄, in 4 of n₃, in 3 of n₂, none in n₀. The resection of the trachea and bronchus in 5 comprised of a resection of laryngotrachea in one (Fig. 2), left and right

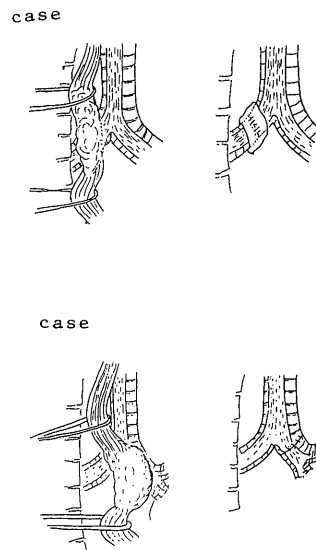
**Fig. 2.** Operative method schema regarding the tracheal or broncheal resection and reconstruction

Table 2. Comparison in surgical outcome between with and without combined resection with aorta and trachea (%)

outcome	AORTA		TRACHEA	
	without resection n=13	with resection n=5	without resection n=8	with resection n=5
operative death	6 (46.1)	1 (20.0)	2 (25.0)	2 (40.0)
hospital death	8 (61.5)	3 (60.0)	6 (75.0)	4 (80.0)
survival patients over 1 m	7 (53.8)	4 (80.0)	6 (75.0)	3 (60.0)
alive	1	1	2	1
died	6	3	4	2
mean survival time months	4.1+3.1	3.0+2.1	3.3+1.8	6.5+5.5

main bronchus in 2, the trachea in one and the membranous portion of the trachea in one respectively. The oncological curability (C_1) of surgery was ensured in all 5 patients. The survival time of the 5 patients ranged from 12 days to 12 months and 3 died within one month after surgery.

On the other hand, the resection of the wall of the aorta in 5 comprised of segmental resection in 4 in whom one had in combination with partial resection of thoracic vertebrae and combined resection of the aorta with left main bronchus in one. The oncological curability of C_1 was achieved in all 4 but one. The survival time ranged from 6 days to 6 months, one still surviving one month after surgery.

RESULTS

The surgical outcome after combined resection with the tracheobronchus and aorta for the treatment of carcinoma of the thoracic esophagus was compared as shown in Table 2. High feasibility rate of a combined resection with the tracheobronchus was shown as compared with that of the aorta. The hospital death was almost the same, although it was excessively high. The patients who survived following surgery were a few in both groups but it was clearly shown that even a few patients survived, reflecting the effectiveness of operations on alleviating severe complaints and

facilitating a high quality of life.

However, the operative death was still high in both groups. The cause of early death following surgery were tracheal bleeding due to DIC, biliary peritonitis caused by purulent cholecystitis, respiratory failure, acute renal failure and bronchial fistula associated with operative technical error. There were mainly based on grave operation insult. In the ten patients, oncological curability was ensured in 8. Surgical curability tends to be ensured easier in case with a resection of the tracheobronchus rather than that of the wall of the aorta. In 2 patients who underwent a resection of the wall of the aorta, cancer residue was found at the site of the bronchial wall. It was shown that cancer infiltration used to be widely extended when the aorta had been involved.

DISCUSSION

Application of combined resection with involved adjacent organs for the treatment of carcinoma of thoracic surgery is still required in spite of detecting an early stage patients according to advances in diagnostic techniques. It is because dysphagia does not appear until the esophagus has obstructed over three fourths of its lumen. Aggressive surgery accompanying combined resection with the aorta, trachea and bronchus is still indicated for far advanced cancer patients as far as the patient's condition

may permit to alleviate life-threatening symptoms and facilitate radicality to surgical oncology. The findings of CT and MR help us decide preoperative indication of aggressive operation for carcinoma of the thoracic esophagus.

Since Thompson¹⁾ first reported in 1973 a successful case with a combined resection of the esophagus with lower trachea and carinal resection, a few reports have shed some light on the extension of surgical indication for a combined resection with the trachea and bronchus⁵⁾.

The obvious disadvantage in a combined resection of the esophagus with the trachea and bronchus is that the trachea and bronchus loose supporting tissues of the esophagus and the feeding vessels into the lateral wall of the trachea cause damage or injury at surgery.

It is a main cause of anastomosis insufficiency at the site of tracheo- and bronchoplasty. Furthermore, wrapping at anastomosis is needed for avoidance of occurring bronchopulmonary artery fistula. Application of pedicled pleura is not adequate as a selection of wrapping material. The pedicled pectoral or latissimus dorsi muscles and the omentum which abound in tissues containing rich vessels are the wrapping material of choice⁶⁾.

There is some limitation of surgical indication for combined resection of the esophagus and the aorta. However, it is no doubt that patients with impending symptoms will set benefit by an aggressive operation to relieve a life-threatening risk. It is well known that cancer infiltration on the wall of the aorta causes obstruction of vasa vasorum which nourish the wall of the aorta. Subsequent ischemic change of the wall of the aorta is particularly prone to occurrence of a catastrophe of rupturing episode. The question arises regarding a postoperative complication of catastrophic episode of rupturing caused by postoperative infection. Whenever a surgeon may try to surgically resect carcinoma of the esophagus involving the aorta, it should be known as to how deep cancer infiltration reaches on the wall of the involved aorta and as to whether the adhesion to the wall of the aorta is caused by inflammation or cancer infiltration.

The indication of aggressive surgery should be considered on the basis of the standpoint of oncological radicality. In this series, adhesion over one half of the circumference of the aortic wall meant a presence of cancer infiltration extending the lamina elastica externa.

As a rule, it is defined whether the margin of the aortic wall on CT finding is clear or not to define the depth of cancer infiltration into the aortic wall.

At present, a combined resection of the esophagus with the aorta is technically feasible and it is possible to make the risk minimized by improved surgical technique and proper pre- and postoperative cares.

On the other hand, there is one major question to be answered that temporary bypass constructed in the same operation field is justified for a postoperative complication of infection, and also extra-anatomic bypass prior to a decision of resectability is valid. It appears to be of no use unless aggressive operation is indicated. And the major problem is to improve the surgical outcome. It is recommended on the basis of a result of this study that postoperative complications be avoided by appropriate early cares to prevent the postoperative complication such as acute renal failure and suppurative cholecystitis and complete node dissection including removal of the tumor be made. Surgeons should be aware of the fact that palliative operation to reduce an operation trauma is of no value to salvage the patients with advanced cancer and also postoperative full course of adjuvant chemotherapy is of help to prolong the survival time.

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