

Bypass Operation by Single-Style Esophageal Plasty Using Small Intestines for Patients with End-Stage Esophageal Cancer which was Impossible to be Cured Radically

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Abstract

The purpose of the present study was to figure out the possibility of the bypass operation in esophageal cancer which is impossible to be cured radically and its effect on the survival rate and quality of life of the patients. In recent years, the incidence of esophageal cancer has been increasing thus there are many problems occurring in keeping the quality of life. Especially gastrostomy is done in order to improve dysphagia in esophageal cancer patients who missed the optimal operation time, but the patients are suffering themselves due to the psychological burden about the gastrostomy and mental factors to miss the time and even some of them require the operation in those situations. We studied three patients diagnosed with esophageal cancer (impossible to be cured radically) from March 2021 to March 2022. All the patients were males, and the average age was 53.3 years. All of them had end-stage esophageal cancer and among them, two were $T_3N_2M_0$ and the other one was $T_3N_2M_1$. We concluded that radical cure by esophagotomy was impossible and bypass operation (single-style esophageal plasty using small intestine) was performed. On discharge, we evaluated the satisfaction of the patients about the operation, postoperative survival duration, and the quality of life by WHOQOL-100. After operation, the patients' quality of life has been improved and the survival duration has been elongated from six months in the past to 12.7 months. Esophageal bypass operation by single-style esophageal plasty is an effective treatment to keep the patients' quality of life, who has esophageal cancer impossible to be incised and increase the survival duration.

Keywords: esophageal cancer, esophageal plasty, bypass, quality of life, small intestine, dysphagia, psychological burden, mental factors

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INTRODUCTION

Esophageal cancer is the third most prevalent cancer among digestive system cancers following gastric and rectal cancer. The main sites of esophageal cancer are lower esophagus (50%), chest middle esophagus (30%), and chest upper esophagus (20%).

Cervical esophageal cancer is extremely rare. The main treatment of esophageal cancer is to cure radically after early diagnosis. The 5-year survival rate after the esophageal cancer incision is below 30%.

However, in case of the cancer, which is impossible to be incised, stent can be inserted to the strictured part or gastrostomosis can be done to provide nutrition to the patients [1, 2].

The patients with gastrostomosis cannot eat oral diet and they have to manage stoma so they have many problems in life. Also, the esophagotracheal fistula generated during assistive therapy such as radiation therapy can cause respiratory infections thus they can affect the survival duration of the patients.

Now, research data have been reported that bypass operation by the esophageal plasty using gastric tube improved the quality of life (QOL) and increased the survival duration of the patients with esophageal cancer which cannot be incised [1, 3, 4].

However, as the cancer is located in the lower esophagus, it normally spreads to the stomach and gastric tube cannot be made in this case.

Thus, we designed esophageal plasty using small intestine and cured the patients who cannot be treated by radical treatment about esophageal cancer but requires operation.

CASE STUDY

We studied three patients diagnosed with esophageal cancer (impossible to be cured radically) from March 2021 to March 2022. All the patients were male and the average age was 53.3 years. All of them were suffering from psychological agonies after the gastric stoma but they all hope an incision of the stomach stoma.

Two patients among the three patients had 1.5×1.5 cm of lymph nodes palpated in upper clavicular fossa and axillary region and no abnormal findings recognized in vital signs. Serum protein in biochemistry test was 5.6 on average.

On esophageal barium fluoroscopy, two patients had narrow esophageal lumen in the abdominal esophagus and the margins were rough. One patient had a filling defect on the level of Th4 with the height of two vertebra. The stage identified for these patients was III in low pars thoracica oesophagi and pars abdominalis esophagi by endoscopy.

On abdominal ultrasound, one case had wall hypertrophy of about 5 mm in the region of lesser curvature of stomach. Thus, the diagnosis was end-stage esophageal cancer (two cases were T3N2M0, one case was esophageal and gastric cancer T3N2M1).

METHODS

All the three cases had severe accretio with surrounding tissue and the lymph node metastasis in mediastinum. It was evaluated that the radical cure by esophageal incision was impossible so they underwent bypass operation (single-style esophageal plasty with small intestine).

All cases used supine position and endotracheal systemic anesthesia. Small intestine (jejunum) was carried up to the sternum and esophageal-intestine anastomosis and gastric-intestine anastomosis were performed until the operation was finished.

On discharge, the satisfaction level of the patients about the operation, postoperative survival duration, and the QOL was evaluated using WHOQOL-100.

RESULTS

After the operation, the quality of life of patients has been improved and the survival duration has been elongated from six months in the past to 12.7 months. Operation results are as shown in Table 1.

The average operation time was found to be 121.7±10.4 min for carrying intestine, 63.3±10.4 min for esophageal-intestine anastomosis, and 36.7±7.6 min for gastric-intestine anastomosis. Postoperative complications were not recognized.

Table 1. Average operation time (min).

Patient	Carrying intestine	Esophagoenterostomy	Gastroenterostomy	Sum
Patient1	110	55	35	200
Patient2	125	60	30	215
Patient3	130	75	45	250
Average ($\bar{X}\pm SD$)	121.7±10.4	63.3±10.4	36.7±7.6	221.7±25.7

After the operation, three patients had postoperative management such as fluid therapy and anti-infection therapy. Grueling diet has been applied since the 3rd day after operation, and then normal diet was continued. After the 10th day, no abnormal findings were recognized on esophageal contrast enema, and all the patients were given oral diets. After the operation, all the three patients removed stoma tube and continued oral diets on 15th day, and they were discharged.

Satisfaction level of the patients about the operation was evaluated and it was found to be all good after operation. Table 2 shows the QOL of the patients after operation (postoperative) as compared to before operation (preoperative). Most end-stage esophageal cancer patients had the survival duration of less than six months in the state of gastric stoma.

However, three patients who had single-style esophageal plasty have survived for 12.7 months on an average and they had a restful life with oral diet even a few days before their death as shown in Table 3.

Table 2. QOL of patients preoperative and postoperative.

	Preoperative	Postoperative
Patient1	15.1	15.7
Patient2	14.8	15.3
Patient3	14.4	15.6
Average ($\bar{X}\pm SD$)	14.8±0.29	15.5±0.2

QOL has been increased after operation as compared to the one before operation.

Table 3. Postoperative survival (months).

	Postoperative survival (months)
Patient1	13
Patient2	11
Patient3	14
Average ($\bar{X}\pm SD$)	12.7±1.1

DISCUSSION

Patients with esophageal cancer, which is impossible to be cured radically, suffer malnutrition and dysphagia which deteriorates the QOL. To increase the survival rate, bypass operation is performed in coupling with postoperational chemoradiotherapy [4].

Although bypass operation is more invasive than stent insertion, it is done on patient's call to maintain the QOL, when the radical cure is impossible due to complications by esophageal cancer [5]. Bypass

operation is beneficial for patients with tracheobronchial cancer, invased into trachea and bronchus, causes esophageal airway stoma during and after chemoradiotherapy.

According to research, esophageal bypass operation is performed to minimize adverse reaction of esophageal airway stoma and maximize the effect of chemoradiotherapy [6]. Esophageal cancer incision is a complicated surgery related to a high prevalence of complication and mortality rate. There are two ways in esophageal incision [5].

Gastric tube interposition is the technique of choice for reconstruction of the hypopharynx and cervical esophagus when the resection extends below the thoracic inlet [2, 6]. In general, for tumors at the gastroesophageal junction or lower-third esophagus (Siewert Type 1 and 2) either transhiatal esophagectomy (THE), left thoraco-abdominal, or Lewis–Tanner (LT) approach (abdomen and right chest incision) are appropriate.

For middle-third tumors, either an LT or a three-stage resection (abdomen, right chest incision, and anastomosis in the neck) is appropriate. Upper-third tumors are now largely treated by primary chemoradiotherapy, and surgery is reserved in early-stage disease when a three-stage resection with possible resection of cricopharyngeus is the operation of choice [7].

Late-stage esophageal cancer, which is impossible to be cured radically suffer malicious malnutrition and especially for esophageal cancer invased into airways causes respiratory infection such as pneumonia, and significantly short survival days.

For the late-stage esophageal cancer, patients are often nurtured by gastro- or enterostomy and thus QOL of patients drop significantly. Therefore, many researchers performed esophageal bypass surgery using gastric tube to solve these problems.

As a result, most patients were able to benefit from oral nutrition; the effect of chemoradiotherapy and survival days of patients increased significantly [1, 3, 4]. But as esophageal cancer are often found in the lower esophagus, gastric tube cannot be made when cancer involved the stomach. These issues were solved in the present study and survival days of patients were also increased.

Our bypass surgery (single-style esophageal plastic method using small intestine) was beneficial due to following reasons:

- First: Those patients in which it is impossible to have radical cure surgery, can also have hope on operation by this method.
- Second: This method removed patient's psychological burden about the gastric stoma.
- Third: Bypass operation is possible in esophageal cancer which is impossible to be cured radically and postoperative complications were not recognized.
- Fourth: High satisfaction level was observed in the patients about the operation and after operation. The survival duration has been elongated from six months in the past to 12.7 months.
- Other factors: When operation was mistaken enough purpose, patients are able to nurture by gastrostomy; postoperative management is also useful [8–10].

CONCLUSION

Esophageal bypass operation by single-style esophageal plasty is an effective treatment to keep the patients' QOL, who has esophageal cancer impossible to be incised. It was also found to increase the survival duration.

Compliance with Ethical Standards

The DPRK is a socialist country, the patient can receive free treatment, and the studies for medical sciences are also supplied from the state. So we do not feel any need for fund and any conflicts of interest. In addition, all the authors included in the present study have no conflicts of interest.

Ethical Approval

All procedures performed in the present study were in accordance with the ethical standards of the Ministry of Public Health, DPRK.

Informed consent

None.

REFERENCES

1. Hihara J, Hamai Y, Emi M, Aoki Y, Taomoto J, Miyata Y, Okada M. Esophageal bypass operation prior to definitive chemoradiotherapy in advanced esophageal cancer with tracheobronchial invasion. *The Annals of Thoracic Surgery*. 2014; 97(1): 290–295p.
2. Lam KH, Wong J, Lim ST, Ong GB. Pharyngogastric anastomosis following pharyngolaryngoesophagectomy: Analysis of 157 cases. *World Journal of Surgery*. 1981; 5: 509–516p.
3. Kimura M, Ishiguro H, Tanaka T, Takeyama H. Advanced esophageal cancer with tracheobronchial fistula successfully treated by esophageal bypass surgery. *International Journal of Surgery Case Reports*. 2015; 9: 115–118p.
4. Kimura M. Bypass operation for Unresectable esophageal Cancer: Postoperative complications after thoracotomy versus no thoracotomy. *Indian Journal of Surgery*. 2016; 78(5): 351–355p.
5. Nguyen NT, Kim E. Consideration for esophagectomy in patients with prior bariatric surgery. *Obesity Surgery*. 2016; 26: 727–729p.
6. Sasaki CT, Salzer SJ, Cahow CE, Son Y, Ward B. Laryngopharyngoesophagectomy for advanced hypopharyngeal and esophageal squamous cell carcinoma: the Yale experience. *The Laryngoscope*. 1995; 105(2): 160–163p.
7. Rankin SC. *Carcinoma of the Esophagus*. UK: Cambridge University Press; 2008. 109–110p.
8. Spiro RH, Shah JP, Strong EW, Gerold FP, Bains MS. Gastric transposition in head and neck surgery: indications, complications, and expectations. *The American Journal of Surgery*. 1983; 146(4): 483–487p.
9. Udagawa H. Laryngectomy-esophageal bypass surgery for unresectable high-level esophageal cancer. *Thoracic Surgery*. 2019; 72(6): 38–39p. Available from: https://webview.isho.jp/journal/detail/pdf/10.15106/j_kyobu72_432. DOI-https://doi.org/10.15106/j_kyobu72_432
10. Uchibori K, Suhara K, Chiba S, Tsuchiya K, Fujie T, Tamaoka A, Sakashita H, Inase N. A case of squamous cell carcinoma of the lung treated with esophageal bypass surgery for bronchoesophageal fistula. *Bronchology*. 2013; 35(2): 150–155p. Available from: https://www.jstage.jst.go.jp/article/jjsre/35/2/35_KJ00008612232/_article/-char/ja/