Int J Clin Exp Physiol. 2023;10(3):87-89.
https://www.ijcep.org

Case Report

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 this study is 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 the esophageal cancer has been increasing, thus there are many problems occurred in keeping the QOL. Especially gastrostomosis is being 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 gastrostoma and mental factors to miss the time and even some of them are requiring the operation in those situations. We studied on three patients diagnosed as the 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. 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 the radical cure by the esophagotomy was impossible and performed bypass operation (single-style esophageal plasty using small intestine). On discharge, we evaluated the satisfactory of the patients about the operation, and postoperative survival duration, and the quality of life by WHOQOL-100. After operation, the patients' QoL 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' QoL, who has esophageal cancer impossible to be incised and increase the survival duration.

Keywords: Esophageal cancer, Esophageal plasty, Bypass, Quality of Life.

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Received: 03-07-2023;
Revised: 26-08-2023;
Accepted: 12-09-2023.

INTRODUCTION

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

The main treatment of the esophageal cancer is to cure radically after early diagnosis. Five-year survival rate after the esophageal cancer incision is below 30%.[1] However, in the case of the cancer which is impossible to be incised, stent can be inserted to the structured part or the gastrostomosis can be done to provide the patients' nutrition. The patients with gastrostomosis cannot take oral diet and they have to manage stoma. Therefore, they have many problems in life and as well, the esophagotracheal fistula generated during the assistive therapy such as radiation therapy can cause respiratory infections thus they can affect the survival duration of the patients.[3,9] Now, research data have been reported that bypass operation by the esophageal plasty using gastric tube increased the survival duration of the patients with esophageal cancer which cannot be incised and improved the quality of life (QoL).[2-5]

However, as the cancer is located in the lower esophagus, it normally spreads to the stomach and gastric tube can't be made in this case. Thus, we designed the esophageal plasty using small intestine and treated the patients who cannot be treated by radical treatment about esophageal cancer but requires operation.

CASE REPORT

We studied three patients diagnosed with esophageal cancer (who were impossible to be treated radically) from March, 2021 to March, 2022. All the patients were male and the average age was 53.3 years and they were suffering from the psychological agonies after the gastric stoma but they all hope an incision of the stomach stoma. Two patients among three, had 1.5×1.5 cm of lymph nodes palpated in upper clavicular fossa and axillary

DOI: 10.5530/ijcep.2023.10.3.23

region and no abnormal findings recognized in vital signs. Serum protein in biochemistry test was 5.6 g/dL on average. On esophageal barium fluoroscopy, two had narrow esophageal lumen in abdominal esophagus and the margins were rough and the one had filling defect on the level of T4 with the height of two vertebra.

Their stage was III in low pars thoracica oesophagi and pars abdominalis esophagi by endoscope. On USG abdomen, 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).

PROCEDURE

All three cases had severe accretion with surrounding tissue and the lymph node metastasis in mediastinum and they were evaluated that the radical cure by esophageal incision was impossible so they had bypass operation (single-style esophageal plasty with small intestine). All cases used supine position and endotracheal systemic anaesthesia. Small intestine (jejunum) was carried up to the sternum and esophageal-intestine anastomosis and gastric-intestine anastomosis were performed until finishing the operation. On discharge, we evaluated the satisfactory of the patients about the operation, and postoperative survival duration, and the quality of life by WHOQOL-100.

RESULTS

Average surgical time (Table 1) was 121.7±10.4 min for carrying intestine to sternum, 63.3±10.4 min for esophageal-intestine anastomosis, and 36.7±7.6 min for gastric-intestine anastomosis and postoperative complications were not recognized. After surgery, all three patients received postoperative management such as fluid therapy, anti-infection therapy and since the 3rd day of surgery, gruel diet was given and then normal diet. After the 10th day, no abnormal findings were recognized on esophageal contrast enema and they started with oral diet.

After surgery, all the three patients removed stoma tube and had oral diet on 15th day and they were discharged. Patient satisfaction about the surgery was evaluated after surgery. After surgery, QoL was assessed and compared to the QoL before surgery (Table 2).

Most end-stage esophageal cancer patients had the survival duration of less than 6 months in the state of gastric stoma. However, three patients who had single-style esophageal plasty survived for 12.7 months on average and they had a restful life with oral diet even a few days before their death (Table 3).

Table 1: Average surgery time (min).

Patient	Carrying intestine	Esophagoenterostomy	Gastroenterostomy	Total
Patient 1	110	55	35	200
Patient 2	125	60	30	215
Patient 3	130	75	45	250
Average ($\overline{XXX}$ ±SD)	121.7±10.4	63.3±10.4	36.7±7.6	221.7±25.7

Table 2: Pre-operative and post-operative QoL.

	Preoperative	Postoperative
Patient 1	15.1	15.7
Patient 2	14.8	15.3
Patient 3	14.4	15.6
Average ($\overline{XXX}$±SD)	14.8±0.29	15.5±0.2

QoL has been increased after operation compared to the one before operation.

Table 3: Postoperative survival (month).

	Postoperative survival
Patient 1	13
Patient 2	11
Patient 3	14
Average ($\overline{XXX}$±SD)	12.7±1.1

DISCUSSION

Patients with esophageal cancer which is impossible to be cured radically suffer malnutrition and dysphagia which deteriorates QoL. Bypass operation was performed in coupling with post-operational chemoradiotheropy to increase survival rate.[4] Although bypass operation is more invasive than stent insertion, it was done on patient's call to maintain QoL, when the radical cure is impassible due to complications by esophageal cancer.[3,5] Bypass operation is beneficial for patients with tracheobronchial cancer, invaded into trachea and bronchus, causes esophageal airway stoma during and after chemoradiotherapy. According to research, esophageal bypass surgery is performed to minimize adverse reaction of esophageal airway stoma and maximize the effect of chemoradiotherapy.[2,6]

Esophageal cancer incision is a complicated surgery related with high prevalence of complication and mortality rate. There are 2 ways in esophageal incision.[1] Whereas gastric tube interposition is the technique of choice for reconstruction of the hypopharynx and cervical esophagus when the resection extends below the thoracic inlet.[7-9] In general for tumors at the level of 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 reserved in early-stage disease when a three-stage resection with possible resection of cricopharyngeus is the operation of choice.[10] Late stage esophageal cancer which is impossible to be cured radically suffer malicious malnutrition and especially for esophageal cancer invaded into airway causes respiratory infection such as pneumonia, and significantly shortens the survival.

For the late-stage esophageal cancer, patients are often nurtured by gastro or enterostomy and thus QoL of patient decreases significantly. Therefore, many research 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 chemoradiotheropy and survival days of patients increased significantly.[2-4] But as esophageal cancer are often found in lower esophagus, gastric tube cannot be made when cancer involved stomach. We were able to solve these issues and increase survival days of patients. Our bypass surgery (single-style esophageal plastic method using small intestine) was beneficial as following. i. Patients developed hope on surgery that were impossible to have radical cure surgery. ii. Our method removed patients' psychological burden about the gastric stoma. iii. There is possibility of the bypass surgery in esophageal cancer which is impossible to be cured radically and postoperative complications were not recognized. iv. There was high satisfaction of the patients about the surgery and after surgery; the survival duration has been elongated from six months in the past to 12.7 months.

CONCLUSION

Esophageal bypass surgery by single-style esophageal plasty is an effective treatment to keep the patients' QoL, who has esophageal cancer impossible to be incised and increase the survival duration.

COMPLIANCE WITH ETHICAL STANDARDS

Before saying Ethical Standards, we will describe about our country. The DPRK is a socialist country, the patient can receive free charge of treatment, and the studies for medical sciences are also supplied from the state. So, we don't feel any needs of fund and any conflicts of interest. In addition, all authors including in this study have no conflicts of interest.

ABBREVIATIONS

QoL: Quality of Life.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Cite this article: Ri GY, Ryu YJ, Kim HJ, Sung U, Song HI, Kim RU, *et al*. Bypass Operation by Single-Style Esophageal Plasty Using Small Intestines for Patients with End-Stage Esophageal Cancer which was Impossible to be Cured Radically. Int J Clin Exp Physiol. 2023;10(3):87-9.