

EVALUATION OF THE RESULTS OF THORACOSCOPIC ESOPHAGECTOMY FOR ESOPHAGEAL CANCER

*Nguyen Van Tiep¹; Dang Viet Dung¹; Le Thanh Son¹
Nguyen Van Xuyen¹; Ho Chi Thanh¹*

SUMMARY

Objectives: To evaluate the results of esophagectomy and operative technique of minimally invasive esophagectomy for esophageal cancer at 103 Military Hospital. Subjects and methods: Retrospective, descriptive study combined a prospective study of 62 patients with esophageal cancer from 1 - 2010 to 9 - 2018. Results: Mean age was 51.91 ± 8.66 (32 - 74), male/female ratio was 14.5/1. Mean operation time was 318.77 ± 64.13 minutes, thoracic step time was 134.00 ± 38.75 minutes, mean blood loss volume during the entire operation was 152.37 ± 52.27 mL. Laparoscopic surgery accounted for 77.4%. Surgical complications: 3 cases (4.8%) with left visceral pleura rupture, 1 case (1.6%) of thoracic duct injury. Mean ventilation time was 18.6 ± 12.6 hours, thoracic drainage time was 5.8 ± 2.8 days, first flatus time was 4.6 ± 1.4 days. Postoperative complications: Operative mortality was 1.6%, respiratory complication was 27.4%, neck anastomosis leakage was 17.7%, raucous was 9.6%, tracheal leakage was 1.6%. Mean postoperative hospitalization time was 18.0 ± 7.2 days (8 - 46 days). Conclusion: Laparoscopic surgery for esophageal cancer is a difficult surgery, early postoperative results were encouraging and should continue monitoring to evaluate the long-term outcomes.

** Keywords: Esophageal cancer; Thoracoscopic esophagectomy.*

INTRODUCTION

Esophageal (EsC) surgery is a severe major operation, both in techniques and anesthesia. EsC radical surgeons used combined incisions. The reasons may be long operating time (often lasts 5 - 8 hours), prolonged atelectasis during operation, muscle chest injuries. The other important reasons are that almost EsC patients are elderly, accompanied by other diseases, cachexia due to no eating for a long time. There is about 5% of the death and 50% of patients estimated with complications (especially respiratory complications) with EsC surgery. About 2 recent decades,

the thoracoscopic esophagectomy conducted in the leading head medical centres has partly reduced the mortality rate and postoperative respiratory complications [1, 2, 3, 4].

To evaluate the results of esophagectomy and operative technique of minimally invasive esophagectomy for esophageal cancer. We conducted this study entitled: *Thoracoscopic esophagectomy in treatment of esophageal cancer.*

SUBJECTS AND METHODS

1. Subjects.

62 patients were diagnosed with esophageal cancer by histopathology.

1. 103 Military Hospital

Corresponding author: Nguyen Van Tiep (chiductam@gmail.com)

Date received: 21/10/2018

Date accepted: 10/12/2018

They had thoracoscopic esophagectomy with gastric tube reconstruction at Department of Abdominal Surgery, 103 Military Hospital from January 2010 to September 2018.

2. Methods.

Retrospective and prospective study, cross-sectional descriptive analysis without control group.

** Indications:*

- The patients were diagnosed with esophageal cancer by histopathology.

- The tumor did not invade to mediastinum including the heart, the aorta (Picus < 90°), the lung, the bronchus...

- The distant metastasis wasn't detected.

** Surgical technique:*

The operation was performed through 3 stages:

- Thoracic stage: Liberating the thoracic esophagus and harvesting mediastinal lymph nodes were performed in the right thoracic cavity. Patients were in prone position, and pillow was placed under the right thorax in thoracic endoscopy stage, the right lung was collapsed throughout the surgery. To liberate the thoracic esophagus from cervical esophagus to abdominal esophagus.

- Abdominal stage: Possibly done by open surgery or by endoscopic surgery, releasing the stomach totally along the lesser curvature and the greater curvature with tying off the left gastric artery and retaining the right gastric artery. The stomach reconstruction was done after opening the abdominal cavity with a small midline incision (in case of endoscopic abdominal surgery).

- Cervical stage: The incision line is on the anterior border of the mastoid muscle, to dissect and resect the cervical esophagus, we try to avoid damaging the recurrent nerve. The gastric esophagus anastomosis is end-to-end anastomosis of simple interrupted stitches.

RESULTS

1. Characteristics of patients.

62 patients: The average age was 51.91 ± 8.66 (32 - 74 years old). Male patients were the majority, male/female ratio was 14.5/1.

2. Surgical characteristics.

Laparoscopic surgery accounted for 77.4%, jejunal tube feeding explained 85.5% and polyric reconstruction occupied 19.4%.

Table 1: Surgical characteristics (n = 62).

Surgical characteristics	No. of patients	Min	Max	Average
Surgical time (minutes)	62	210	480	318.77 ± 64.13
Thoracic step (minutes)	62	60	215	134.00 ± 38.75
Abdominal step (minutes)	62	60	250	111.55 ± 33.77
Cervical step (minutes)	62	50	125	75.52 ± 17.94
Blood-infused volume (mL)	62	250	1250	426.12 ± 168.26
Blood-loss volume (mL)	62	60	300	152.37 ± 52.27
Gastric tube length (cm)	62	30.5	39.5	33.84 ± 1.81

Table 2: The early postoperative results (n = 62).

The early postoperative results	No. of patients	Min	Max	Average
Mechanical ventilation time (hours)	62	2	63	18.6 ± 12.6
Time of removing the pleural drainage catheter (days)	62	3	14	5.8 ± 2.8
Time of appearing fart (days)	62	1	9	4.6 ± 1.4
Postoperative hospitalization time (days)	62	8	46	18.0 ± 7.2

* *Surgical catastrophes (n = 62)*: Left visceral pleura rupture: 3 patients (4.8%); thoracic duct injury: 1 patient (1.6%); death: 0 patient.

* *Early postoperative complications (n = 62)*:

Respiratory complications: 17 patients (27.4%); anastomotic leakage: 11 patients (17.7%); tracheal leakage: 1 patient (1.7%); hoarse: 6 patients (9.6%); death: 1 patient (1.6%); others: 3 patients (4.8%).

* *Postoperative respiratory complications (n = 17)*:

Pneumonia: 4 patients (23.5%); pneumonia + pleural infusion: 2 patients (11.8%); pleural infusion: 9 patients (52.9%); empyema: 2 patients (11.8%).

Table 6: Postoperative results of stage of disease (n = 62).

Stages of disease	AJCC criteria (2002)	
	Number	Percentage (%)
Stage 0	1	1.6
Stage I	1	1.6
Stage IIa	7	11.3
Stage IIb	11	17.7
Stage III	41	66.1
Stage IV	1	1.6
Total	62	100.0

DISCUSSION

Through the study on 62 patients who had thoracoscopic esophagectomy with gastric tube reconstruction for esophageal cancer treatment from January 2010 to September 2018, we withdrew some following conclusions:

- Surgical time: An average of 318.77 ± 64.13 minutes, because esophageal cancer surgery is a serious and complicated surgery, many steps (the chest, the abdomen, the joint in the left neck). According to Nguyen Duc Huan: Surgery time was from 180 to 596 minutes,

an average of 316.0 minutes [2]. Tran Phung Dung Tien also showed that the average of surgical time was 319.7 ± 13.4 minutes [4].

- Technically: Prepare patients before surgery to ensure good ventilation of the lungs, because the time of thoracoscopic esophagectomy should cause the right lung to collapse, so before surgery, patients practiced breathing exercises and measured respiratory function. The extent of surgery is due to the removal of the entire esophagus, the formation of gastric tubes to replace the esophagus, so patients were alimented before surgery, mainly through intravenous fluids because it is very difficult for these patients to eat, usually only drink liquid. Regarding surgical techniques, all patients were performed the endoscopic surgery in the thoracic step to release the thoracic esophagus section with the right surgical field and prone position. In the abdominal step, stomach release can be done with open surgery or endoscopic surgery. 77.4% of patients in the study were released the stomach by endoscopic one, then reconstructing the stomach by a small midline incision above the umbilicus, the gatroesophageal anatomosis was placed at the cervical base. In order to feed the gastric tube well for the purpose of gastric bypass surgery, we advocate conserving the right ventricular diastolic and left ventricle, the diameter of the duodenal tube is sufficient (diameter about 3 - 4 cm) without gastric tube too wide, about the length of the gastric tube to try to avoid stretching (average 33.84 ± 1.81 cm, Liebermann: 39.0 ± 3.0 cm on foreign

patient [6]. All patients were given open bowel ventilation for early postoperative care.

* *Sugical complications*: 4 patients (6.4%), of which 3 cases of left mediastinal pleura torn during dissection was free from the esophagus, the 3 cases were caused by tumor invasion into pleura. In these two cases, we tightly sealed the ligament, and at the same time screened X-ray after surgery and having no splenectomy or left ventricular dilatation. One case of chest injury, due to minor injuries, postoperative lesions, no postoperative grip hole. According to Trieu Trieu Duong, 69 patients had a 5.7% of morbidity rate, including thoracic aortic tear, tracheal lobe disease and lung parenchymal injury [1].

* *Early postoperative results*:

+ The mean duration of mechanical ventilation was 18.6 ± 12.6 hours. The longer the ventilation time, the greater the respiratory complications. The average drainage time was 5.8 ± 2.8 days. The median time to digestion was shorter after surgery, with an average time of 4.6 ± 1.4 days. The mean hospital stay was 18.0 ± 7.2 days (Luketich J.D: 7 days), Wijnhoven: 14 days [9], Trieu Trieu Duong: 13.6 ± 4.9 days [1].

+ Postoperative complications: After surgery, there was one death (1.6%) at day 8 after surgery. It was a 40-year-old male patient, smoking history, heavy alcohol consumption, skin condition, 3-month choking manifestation, T3N0M0 phase through CT, endoscopy, the surgery time was 330 minutes. After 3 days of respiratory distress, X-ray film showed pneumothorax in the right later with a

fever of 38 - 38.5°C, CT-scan revealed bilateral pneumonia, pneumothorax - bilateral effusions patients worsening progression and death on day 8 after surgery. Other authors reported mortality from 1.4 to 8.3% [1, 2, 8]. Respiratory complications remain the most common and severe complications in esophageal cancer surgery, which is also a complication or death after surgery. In the study, 27.4% of patients had coronary artery disease, stomach pneumonia, hydrocephalus, pneumothorax, to limit these complications we often use antibiotics in surgery and postoperative, drainage suction pocket sterile pleural cavity, sealed, one-way and early withdrawal of drainage of the pleural cavity when screening the pleural cavity of fluid and gas [5, 6, 7, 8].

+ Esophageal anastomotic fistula - left gastric craton: 11 patients (17.7%), which is a common complication, often manifested leakage after 1 week's surgery, cause leakage mainly minority anastomosis, anastomotic fistula despite not dangerous to the life and the majority can heal without resurgery, but postoperative anastomotic stenosis leads to reduced quality of life. To limit anastomotic leakage, do not hurt blood vessels in the process of liberation, it is necessary to foster a good preoperative and postoperative, mouth wide enough connection (2.5 - 3 cm) [6]. Pham Duc Huan: anastomotic fistula 7.1% [2]; Zhao Chaoyang: anastomotic fistula 7.25% [1].

+ Hoarse complications due to recurrent nerve damage occupied 9.6%, these symptoms are said to appear immediately

after surgery, most will recover slowly after several months if only nerve damage is reversed [8]. Reverse neuropathy in this study is due to the technique of removing the esophagus from the neck with no apparent reoperation of the nerve. According to Orringer, metal ball should not be used, avoiding direct contact with the tracheal tract to minimize back injury. Can use the fingers to peel the esophagus deep in the media. In 1 patient with T4 tumor invasive pneumonia, the patient had to reopen the incision in the neck to suture the esophagus.

+ Stage postoperative stage was mainly in stage III (66.1%); there was 1 patient (1.6%) who underwent surgery for stage III, but after invasive surgery, it was determined that stage IV, which indicated that the patient came to the hospital, which affects the ability of the patient to undergo radical surgery and the patient's lifetime after surgery.

CONCLUSION

Esophageal cancer is a serious disease, open surgery is often severe and many complications. The use of laparoscopic surgery of the thoracic and gastric abdomen to remove the esophagus is a method that can be applied to achieve good results for patients. Average surgery time was 318.77 ± 64.13 minutes, mean loss of blood was 152.37 ± 52.27 mL, incidents in surgery 6.4%, average mechanical ventilation time 18.6 ± 12.6 hours, the drainage of the pleural cavity 5.8 ± 2.8 days, the duration of

defecation 4.6 ± 1.4 days. Postoperative complications: mouth leakage: 11 patients (17.7%), respiratory complications 27.4%, hoarseness 9.6%. One patient died (1.6%), mean duration of hospital stay was 18.0 ± 7.2 days.

REFERENCES

1. Triệu Triều Dương, Trần Hữu Vinh. Đánh giá kết quả điều trị ung thư thực quản 1/3 giữa-dưới bằng phẫu thuật nội soi. Y học Thực hành. 2014, 1 (902), tr.62-66.
2. Phạm Đức Huấn, Đỗ Mai Lâm. Cắt thực quản qua nội soi trong điều trị ung thư thực quản. Hội nghị Khoa học Phẫu thuật Nội soi - Nội soi và Ngoại khoa Việt Nam. Huế. 2015.
3. Đỗ Minh Hùng, Phan Thanh Tuấn, Nguyễn Phú Hữu và CS. Kết quả sớm phẫu thuật nội soi ngực bụng cắt thực quản nạo hạch hai vùng với tư thế nằm sấp. Hội nghị Khoa học Phẫu thuật Nội soi - Nội soi và Ngoại khoa Việt Nam. Huế. 2015.
4. Trần Phùng Dũng Tiến. Đánh giá kết quả phẫu thuật nội soi cắt thực quản điều trị ung thư thực quản 2/3 dưới. Luận án Tiến sỹ Y học. Đại học Y - Dược Thành phố Hồ Chí Minh. Hồ Chí Minh. 2016.
5. Decker G, Coosemans W, De Leyn P et al. Minimally invasive esophagectomy for cancer. Eur J Cardiothorac Surg. 2009, 35 (1), pp.13-20; discussion 20-21.
6. Luketich J.D, Pennathur A, Awais O et al. Outcomes after minimally invasive esophagectomy: Review of over 1,000 patients. Ann Surg. 2012, 256 (1), pp.95-103.
7. Luketich J.D, Schauer P.R, Christie N.A et al. Minimally invasive esophagectomy. Ann Thorac Surg. 2000, 70 (3), pp.906-911; discussion 911-912.
8. Mamidanna R, Bottle A, Aylin P et al. Short-term outcomes following open versus minimally invasive esophagectomy for cancer in England: A population-based national study. Ann Surg. 2012, 255 (2), pp.197-203.