

## Akiyama Procedure for Esophageal Cancer Complicated with Aspergillosis – Case Report

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### Abstract

#### *Background*

Esophageal cancer is a challenging diagnosis especially in its advanced stages, with poor prognosis. However, advances in surgical technique and chemo-radiotherapeutical modalities has improved the outcomes. The main histological types are adenocarcinoma and squamous cell carcinoma, with the latter more prevalent in the upper parts of the esophagus and more aggressive. Certain risk factors have been identified, such as smoking, alcohol consumption, a diet poor in fruits and vegetables, high BMI and reflux disease. Some stages of the disease are considered resectable, and may benefit from surgical interventions. Morbidity and mortality rates are in decline in recent decades, with the improvement of perioperative intensive care.

#### *Case presentation*

The 52-year-old male patient was diagnosed with squamous cell carcinoma of esophagus, located between the upper and middle 1/3 portions. He underwent the full cycles of chemoradiotherapy according to current oncological protocols. As an accompanying condition, the patient had a cavernous aspergilloma of the right lung apex of 4cm diameter. This report presents the successful surgical management, with the Akiyama Procedure (subtotal esophagectomy and cervical esogastric anastomosis with a retrosternal tubularised stomach) and right upper lobe pulmonary resection. The patient tolerated the procedure well, with uneventful post-operative course. He was discharged in good health on the 14th post-operative day, following successful barium radiograph test and food deglutition.

#### *Discussion*

Aspergillomas can form on pre-existing lung cavities, in patient that have recovered from cavernous tuberculosis. Immunosuppressed patients treated for rheumatoid arthritis, inflammatory bowel disease or undergoing chemotherapy are also susceptible to aspergillomas. The patient was carefully evaluated by the respiratory medicine specialist and antifungal medication was started prior to surgery. However, surgical treatment for esophageal cancer could not be delayed indefinitely and the patient was proposed the concurrent surgery for both esophageal cancer and pulmonary aspergilloma.

#### *Conclusion*

Current guidelines for patients in stages T1 or T2, N0 recommend surgery. In T3 patients or N1/M1 chemo-radiotherapy prior to any surgical decision is recommended. Advanced stages of the disease are referred for chemoradiotherapy alone or palliative treatment. Regarding pulmonary aspergillomas, surgical treatment aims to resect the affected cavity, along with the obliteration of the fungal mass. The recommended surgical approach is an anatomical resection of the pulmonary lobe, which may not be well tolerated in patients with poor physical reserves.

**Keywords:** General Surgery, Esophageal Cancer, Lung Aspergilosis, Esophagectomy, Akiyama Procedure.

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## 1. Introduction

Esophageal cancer is a challenging diagnosis especially in its advanced stages, with poor prognosis. However, advances in surgical technique and chemo-radiotherapeutical modalities has improved the outcomes.

The main histological types are adenocarcinoma and squamous cell carcinoma, with the latter more prevalent in the upper parts of the esophagus and more aggressive. Certain risk factors have been identified, such as smoking, alcohol consumption, a diet poor in fruits and vegetables, high BMI and reflux disease.

Diagnosis is confirmed via endoscopy and histopathology. Imaging techniques such as CT, MRI or endoscopic ultrasound are necessary for staging. Clinically, patients with esophageal cancer may appear cachectic due to weight loss, with pale skin. Laboratory tests may show chronic blood loss. Signs such as voice hoarseness, enlarged liver or palpable cervical or supraclavicular lymph nodes indicate advanced stages of the disease.

Some stages of the disease are considered resectable, and may benefit from surgical interventions. Morbidity and mortality rates are in decline in recent decades, with the improvement of perioperative intensive care.

## 2. Case presentation

### 2.1 Medical history

The 52-year-old male patient was diagnosed with squamous cell carcinoma of esophagus, located between the upper and middle 1/3 portions. He underwent the full cycles of chemoradiotherapy according to current oncological protocols. As an accompanying condition, the patient had a cavernous aspergilloma of the right lung apex of 4cm diameter.

### 2.2 Details of the procedure

The surgical procedure begins with a right thoracotomy. The right lung is deflated and we begin the dissection of the esophagus on its thoracic course. The Azygos vein is preserved in this case due to its safe distance from the tumour. Esophagus is then amputated in its upper 1/3 portion in clear margins distant to the tumour.

In this stage, the focus is shifted to the lung, on its apex. The upper lung lobe containing the cavernous aspergilloma is resected.

Next, upon a left cervical incision along the sterno-cleido-mastoid muscle, we access the posterior thyroid and tracheal space after dissecting the anterior neck muscles. The esophagus is dissected and locoregional lymphatic curage is performed. Cervical esophagus is fully mobilised and placed over the surgical wound, ready for anastomosis.

The following stage is the abdominal phase. The stomach is mobilised and dissected, preserving the right gastroepiploic vessels and pyloric artery. Using GIA stapler, the greater curvature of the stomach is shaped into a tube, following careful measurements to provide the needed length for a tension-free cervical anastomosis. Heineke-Mikulicz pyloroplasty is performed. Using manual dissection, we create a retrosternal tunnel. The tubularised stomach is passed through this cavity, making sure that it is not rotated along its axis.

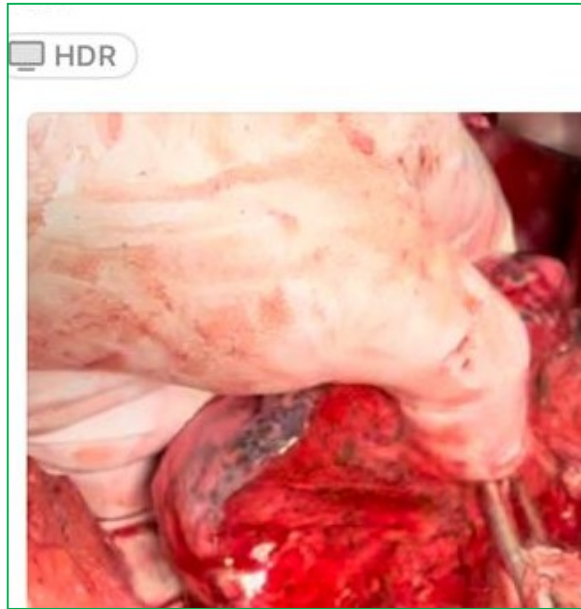
A cervical eso-gastric anastomosis is performed. The procedure ends with the positioning of two thoracic drains, two abdominal drains and a feeding jejunostomy, to provide nutrition during the recovery phase and in case of an anastomotic fistula.

### 2.3 Post-operative period

The patient tolerated the procedure well, with uneventful post-operative course. He was discharged in good health on the 14<sup>th</sup> post-operative day, following successful barium radiograph test and food deglutition.



Figure 1. Right thoracotomy, dissection of esophagus and preserving azygos vein.



Figures 2. 3. Resection of the upper lobe of the right lung.



Figure 4. Cervical phase



Figure 5. Abdominal phase. Stomach mobilisation.



Figure 6. Stomach tubularisation. GIA cuts in the lesser curvature.



Figure 7. Measuring the length of gastric tubage.

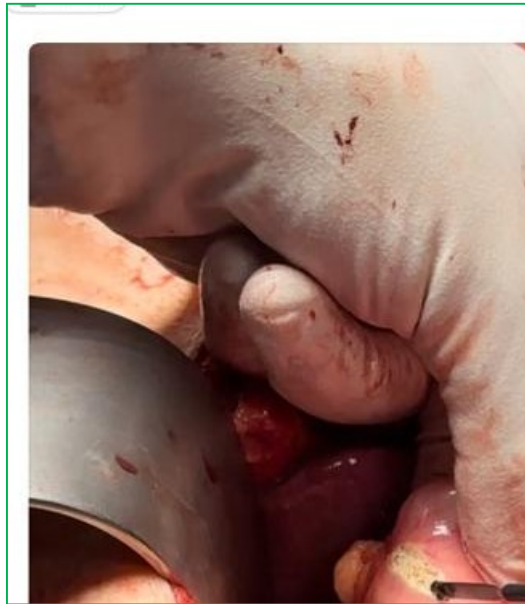


Figure 8. Heineke-Mikulicz pyloroplasty.

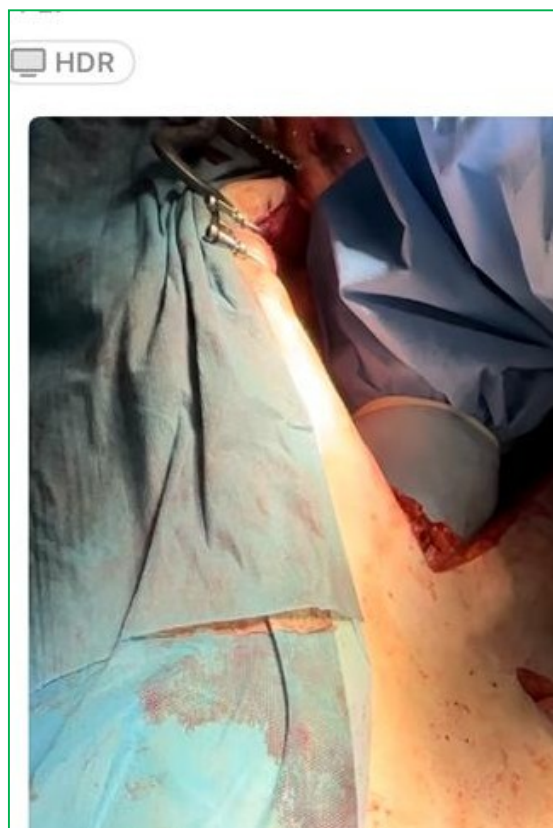


Figure 9. Creating the retrosternal tunnel.

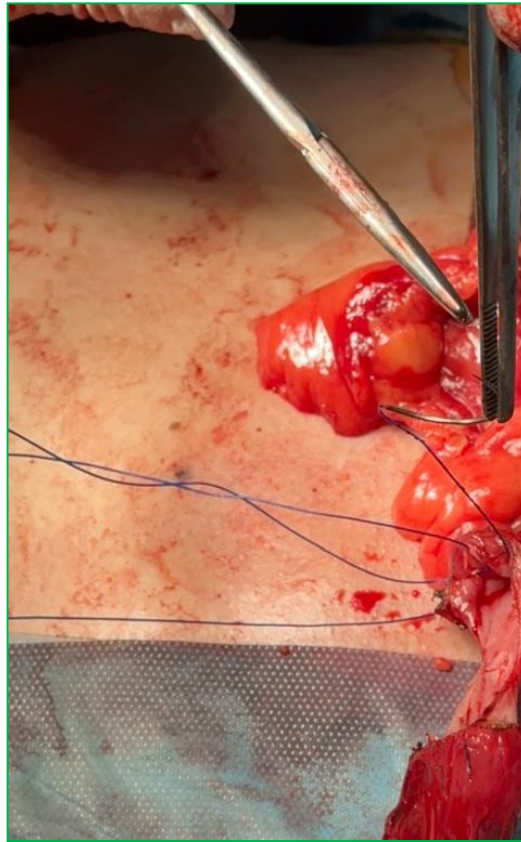


Figure 10. Purse-string suture for stapler head applied to the esophageal stump.



Figure 11. Stapler esophago-gastric cervical anastomosis.

### 3. Discussion

The surgical case being studied in this report had a concomitant condition of pulmonary aspergilloma.

Aspergillomas can form on pre-existing lung cavities, in patient that have recovered from cavernous tuberculosis. Immunosuppressed patients treated for rheumatoid arthritis, inflammatory bowel disease or undergoing

chemotherapy are also susceptible to aspergillomas.

The medical treatment for aspergillomas has been not very successful, due to cavity and avascular nature of the fungal mass. Anti-fungal medications can reduce symptoms, but nevertheless are ineffective.

The patient was carefully evaluated by the respiratory medicine specialist and antifungal medication was started prior to surgery. However, surgical treatment for esophageal cancer could not be delayed indefinitely and the patient was proposed the concurrent surgery for both esophageal cancer and pulmonary aspergilloma.

#### 4. Conclusion

To conclude, as in other malignant diseases, a prior evaluation and staging is required to ensure the patient receives the best treatment, with higher chances of a positive outcome in terms of survivability and quality of life.

Current guidelines for patients in stages T1 or T2, N0 recommend surgery. In T3 patients or N1/M1 chemoradiotherapy prior to any surgical decision is recommended. Advanced stages of the disease are referred for chemoradiotherapy alone or palliative treatment.

Regarding pulmonary aspergillomas, surgical treatment aims to resect the affected cavity, along with the obliteration of the fungal mass. The recommended surgical approach is an anatomical resection of the pulmonary lobe, which may not be well tolerated in patients with poor physical reserves.

#### Conflict of interest

The author(s) declare(s) that there is no conflict of interest. The authors alone are responsible for the content and writing of the paper.

#### Financial disclosure

There is no financial support to this study.

#### Ethical aspect

Informed consent was obtained from all participants in the study and all procedures were conducted in accordance with the Declaration of Helsinki.

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