CHAPTER 28

ESOPHAGEAL CANCER DIAGNOSIS AND STAGING

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INTRODUCTION

Esophageal cancer is one of the most common causes of cancer-related deaths worldwide. Squamous cell carcinoma (SCC) and adenocarcinoma appear to be more than 95% in malignant tumors of the esophagus [1, 2]. In the 1960s, SCC was the type that appeared in more than 90 percent of esophageal cancers in the United States, while adenocarcinomas were very rare. To date, the incidence of esophageal adenocarcinoma has increased importantly, responsible for> 60% of all esophageal cancers in the USA [2]. However, SCC is still the most common histopathological type worldwide [1].

Esophageal SCCs and adenocarcinomas contain differences in several features such as tumor localization and predisposing factors. Risk factors for SCC are smoking, drinking alcohol, mutations of enzymes that metabolize alcohol, achalasia, caustic injury, thoracic radiation history, poor oral hygiene, low socioeconomic status, nutritional deficiencies, and non-epidermolytic palmoplantar keratoderma. Risk factors for adenocarcinoma are symptomatic gastroesophageal reflux disease, barret esophagus, smoking, obesity, history of thoracic radiation, low nutrition with vegetables and fruits, increased age, male sex, drugs that relax the lower esophageal sphincter, and positive familial history [3]. Esophageal SCCs and adenocarcinomas are described as two different diseases with specific epidemiology, pathogenesis, and tumor biology. However, whether histology affects the therapeutic approach and how it affects is controversial.

CLINICAL FINDINGS

Clinical symptoms and signs in esophageal cancer appear according to the length and localization of the cancer, its invasion, and the distant metastases. The most common complaint that comes to the fore in patients with esophageal cancer is dysphagia. Weight loss, chest pain, regurgitation and vomiting, anorexia, hoarseness, cough, hematemesis, Horner Syndrome are symptoms and signs that can be seen in esophageal cancer cases. Although rare, most of the esophageal cancers detected at an early stage are asymptomatic [4, 5].

In the current series, approximately 6-10% of cases are asymptomatic at the time of diagnosis [2]. Most early (superficial) esophageal cancers in the U.S. are detected by chance or during screening or monitoring of Barrett's esophagus. Early intramucosal cancers are specifically asymptomatic.

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Lymphadenectomy should be done according to the new AJCC 8th edition regional lymph node map. In the optimum number of lymphadenectomies for maximum survival, there is a simple rule, such as resection of 10 regional lymph nodes for pT1 cancers, 20 for pT2, and ≤30 for pT3 [16].

Theoretically, pathological staging has the potential to provide precise cancer follow-up in the post-esophagectomy period. Using this information to guide postoperative adjuvant therapy will support more effective treatment.

8th edition post-neoadjuvant staging

What is new in the eighth edition is the stage grouping of patients undergoing neoadjuvant therapy and pathological examination of resection materials. Groupings are the same for both cell types (Table 4) [16].

Table 4. Postneoadjuvant therapy (ypTNM) stage groups

ypStage group	ypT	ypN	ypM
I	T0–2	N0	M0
II	T3	N0	M0
IIIA	T0–2	N1	M0
IIIB	T4a	N0	M0
	T3	N1–2	M0
	T0–3	N2	M0
IVA	T4a	N1–2, X	M0
	T4b	N0–2	M0
	T1–4	N3	M0
IVB	T1–4	N0–3	M1

X, not defined.

Another area where integrated PET / CT can be clinically useful is re-staging after initial induction therapy, a method with increasing frequency of application in locally advanced diseases. Limited experience shows that whole-body PET / CT imaging detects distant metastases in approximately 8% of patients following induction chemoradiotherapy [24, 25]. In addition to the detection of occult metastatic disease, FDG-PET scan after induction therapy gives information on the metabolic response in the primary tumor. Thus, it can be clinically useful in choosing the next treatment. Early data from retrospective series suggest that post-chemoradiotherapy FDG-PET screening can serve to identify patients who can avoid surgery. Other data suggest that responses observed in PET scans during induction chemotherapy have an important predictive and prognostic effect.

CONCLUSION

Patients with advanced thoracic or cervical esophageal carcinoma generally present with progressive dysphagia and weight loss. Esophageal cancer is usually diagnosed by endoscopic biopsy. After the diagnosis of esophageal cancer, treatment is decided by TNM staging, which includes the extent of local disease and distant metastases. EUS is a popular method in locoregional staging. Distant metastasis assessment may include the neck, chest, and abdominal contrast-enhanced CT, whole-body integrated FDG PET / CT, EUS, and/or diagnostic laparoscopy.

REFERENCES

1. Turkyilmaz A, Aydin Y. Diagnostic techniques in esophageal diseases. Toraks cerrahi bülteni. 2011;2:242-253.
2. Saltzman JR, Gibson MK. Clinical manifestations, diagnosis, and staging of esophageal cancer. In: Savarese DMF, ed. UpToDate. 2018. Available at: http://www.uptodate.com/home.
3. Meves V, Behrens A, Pohl J. Diagnostics and early diagnosis of esophageal cancer. Viszeralmedizin. 2015;31:315–318.
4. Yekeler E, Karaoglanoglu N. Clinic and staging of esophageal cancer. J Exp Clin Med. 2012; 29:S227-S231.
5. Li S, Chung DC, Mullen JT. Screening high-risk populations for esophageal and gastric cancer. J Surg Oncol. 2019;120:831-846.
6. Turkyilmaz A, Eroglu A, Aydin Y, Yılmaz O, Karaoglanoglu N. Survival in esophageal cancer patients with hematogenous distant organ metastases. Turk J Med Sci 2009;39:415-21.
7. Hünerbein M, Ghadimi BM, Haensch W, Schlag PM. Transendoscopic ultrasound of esophageal and gastric cancer using miniaturized ultrasound catheter probes, Gastrointest Endosc, 1998;48:371.
8. Lordick F, Mariette C, Haustermans K, ObermannováR, Arnold D. Oesophageal cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. ESMO Guidelines Committee Ann Oncol, 2016;27:50-57.

9. Foley K, Findlay J, Goh V. Novel imaging techniques in staging oesophageal cancer. Best Pract Res Clin Gastroenterol. 2018;36-37:17-25.
10. Moaven O, Wang TN. Combined Modality Therapy for Management of Esophageal Cancer: Current Approach Based on Experiences from East and West. Surg Clin North Am. 2019;99:479-499.
11. Ahmed O, Ajani JA, Lee JH. Endoscopic management of esophageal cancer. World J Gastrointest Oncol. 2019;11:830-841.
12. Vining P, Birdas TJ. Management of clinical T2N0 esophageal cancer: a review. J Thorac Dis. 2019;11(Suppl 12):S1629-S1632.
13. Krill T, Baliss M, Roark R, Sydor M, et al. Accuracy of endoscopic ultrasound in esophageal cancer staging. J Thorac Dis. 2019;11(Suppl 12):S1602-S1609.
14. Akin EA, Qazi ZN, Osman M, Zeman RK. Clinical impact of FDG PET/CT in alimentary tract malignancies: an updated review. Abdom Radiol (NY). 2020;45:1018-1035.
15. Udagawa H, Ueno M. Comparison of two major staging systems of esophageal cancer-toward more practical common scale for tumor staging. Ann Transl Med. 2018;6:76.
16. Rice TW, Patil DT, Blackstone EH. 8th edition AJCC/UICC staging of cancers of the esophagus and esophagogastric junction: application to clinical practice. Ann Cardiothorac Surg. 2017;6:119-130.
17. Yu T, Geng J, Song W, Jiang Z. Diagnostic Accuracy of Magnifying Endoscopy with Narrow Band Imaging and Its Diagnostic Value for Invasion Depth Staging in Esophageal Squamous Cell Carcinoma: A Systematic Review and Meta-Analysis. Biomed Res Int. 2018;2018:8591387.
18. Schmidt T, Lordick F, Herrmann K, Ott K. Value of functional imaging by PET in esophageal cancer. J Natl Compr Canc Netw. 2015;13:239-47.
19. Wang BY, Goan YG, Hsu PK, Hsu WH, Wu YC. Tumor length as a prognostic factor in esophageal squamous cell carcinoma. Ann Thorac Surg. 2011;91:887-93.
20. Rice TW, Blackstone EH, Rusch VW. 7th Edition of the AJCC Cancer Staging Manual: Esophagus and Esophagogastric Junction. Ann Surg Oncol. 2010;17:1721–24.
21. Boonstra JJ, Koppert LB, Wijnhoven BP, Tilanus HW, et al. Chemotherapy followed by surgery in patients with carcinoma of the distal esophagus and celiac lymph node involvement. J Surg Oncol. 2009;100:407-13.
22. van Vliet EP, Heijenbrok-Kal MH, Hunink MG, Kuipers EJ, Siersema PD. Staging investigations for oesophageal cancer: a meta-analysis. Br J Canc 2008;98:547-57.
23. Shi W, Wang W, Wang J, Cheng H, Huo X. Meta-analysis of 18FDG PET-CT for nodal staging in patients with esophageal cancer. Surg Oncol 2013;22:112-6.
24. Sánchez-Izquierdo N, Perlaza P, Pagès M, Buxó E, et al. Assessment of esponse to Neoadjuvant Chemoradiotherapy by 18F-FDG PET/CT in Patients With Locally Advanced Esophagogastric Junction Adenocarcinoma. Clin Nucl Med. 2020;45:38-43.
25. de Gouw DJJM, Klarenbeek BR, Driessen M, Bouwense SAW, et al. Detecting Pathological Complete Response in Esophageal Cancer after Neoadjuvant Therapy Based on Imaging Techniques: A Diagnostic Systematic Review and Meta-Analysis. J Thorac Oncol. 2019;14:1156-1171.