Human Pathology: Case Reports (2014) 1, 40–44

ELSEVIER

Human PATHOLOGY Case Reports

www.humanpathologycasereports.com

Basaloid squamous cell carcinoma of esophagus expressing KIT: A case report with immunohistochemical analysis

Tadashi Terada*

Department of Pathology, Shizuoka City Shimizu Hospital, Miyakami 1231 Shimizu-Ku, Shizuoka 424–8636, Japan

Received 28 June 2014; revised 15 August 2014; accepted 18 September 2014

Keywords:
Esophagus;
Basaloid squamous cell carcinoma;
Histopathology;
Immunohistochemistry;
KIT;
PDGFRA

Abstract Basaloid squamous cell carcinoma of esophagus (BSCC-E) is rare. This case report is the first demonstrating KIT protein expression of BSCC-E. A 74-year-old man presented with dysphagia. Endoscopy revealed a polypoid tumor (2 × 2 × 2.5 cm) with a stalk in cervical esophagus. Biopsy showed squamous cell carcinoma with undifferentiated areas. An endoscopic submucosal dissection (ESD) was performed. Grossly, it was solid tumor with white cut surface. Histologically, the tumor was hypercellular carcinoma consisting of solid areas of island. The tumor cells were composed of basaloid malignant cells with hyperchromatic nuclei, scant cytoplasm, and basophilic cytoplasm. Many mitotic figures were recognized. Foci of comedonecrosis were scattered. Areas of squamous and glandular differentiations were scattered. Immunohistochemically, the tumor cells were positive for pancytokeratin (PCK) CAM5.2, PCK AE1/3, cytokeratin (CK) 7, KIT, CEA, CA19-9, EMA, Ki-67 (labeling index = 80%). The tumor cells were negative for CK20, PDGFRA, NSE, vimentin, estrogen receptor, p53 protein, chromogranin, synaptophysin, CD56, and TTF-1.

1. Introduction

Basaloid squamous cell carcinoma (BSCC) of esophagus (BSCC-E) is a rare malignant neoplasm. It is morphologically characterized by basal cell carcinoma-like squamous cell carcinoma frequently showing glandular differentiation and comedonecrosis [1]. The cells of BSCC have hyperchromatic nuclei increased nucleo-cytoplasmic ratio, and basophilic cytoplasm, thus resembling basal cell carcinoma of the skin [1]. A review of English literature by PubMed search revealed about 50 case reports or case series of BSCC-E [2,3] and about 10 case reports or case series with immunohistochemical study [1,4,5]. However, there are no reports of the protein expression and gene mutational status of *KIT* (CD117) and platelet-derived growth factor-α (*PDGFRA*) in BSCC-E.

KIT and *PDGFRA* genes, both mapped to 4q12, encode receptor tyrosine kinase oncoproteins called KIT (CD117) and PDGFRA, respectively [6–11]. Both molecules are transmembranous oncoproteins involved in tumorigenesis of some neoplasms including gastrointestinal stromal tumor (GIST), acute myeloid leukemia, mast cell neoplasms, germ

* Tel.: +81 54 336 1111; fax: +81 54 336 1315.
E-mail address: piyo0111jp@yahoo.co.jp.

http://dx.doi.org/10.1016/j.ehpc.2014.09.005

cell tumors, melanoma, neuroendocrine carcinomas (NEC), large cell neuroendocrine carcinoma (LCNEC), adenoid cystic carcinoma (ACC), small cell lung carcinoma (SCLC), and extra-pulmonary small cell carcinoma (SmCC) [12–27]. The hot spots of gene mutations are exons 9, 11, 13, and 17 of *KIT* gene and exons 12 and 18 of *PDGFRA* gene [6–11].

Herein, reported is a case of BSCC-E with protein expression of KIT but without protein expression of PDGFRA. A genetic analysis revealed no mutations of the *KIT* and *PDGFRA* genes.

2. Case report

A 74-year-old man presented with dysphagia and anemia. Blood test revealed anemia (red blood cells 282 × 10^4/μl, normal 450–550 × 10^4/μl), high creatinine (1.32 mg/dl, normal 0.4–1.2), high C-reactive protein (5.72 mg/dl, normal 0–0.3), and low Fe (17 μg/dl, normal 54–200). The serum tumor markers showed elevated SCC (2.0 ng/ml, normal 0–1.5). Serum CEA was within normal ranges. Upper gastrointestinal endoscopy revealed a polypoid tumor (2 × 2 × 2.5 cm) with a stalk in the cervical esophagus (Fig. 1). The biopsy showed squamous cell carcinoma with undifferentiated areas. Imaging modalities (CT, PET, PET-CT, and MRI) showed no tumors other than the esophageal tumor. Because the tumor was polypoid and the biopsy showed no apparent invasion, an endoscopic submucosal dissection (ESD) of the polypoid tumor was performed successfully.

Gross pathological examination showed that the tumor is solid tumor with white cut surface (Fig. 2). Histologically, the tumor is hypercellular carcinoma consisting of solid areas of island (Fig. 3A). The tumor was continuous with surface esophageal squamous epithelium which showed

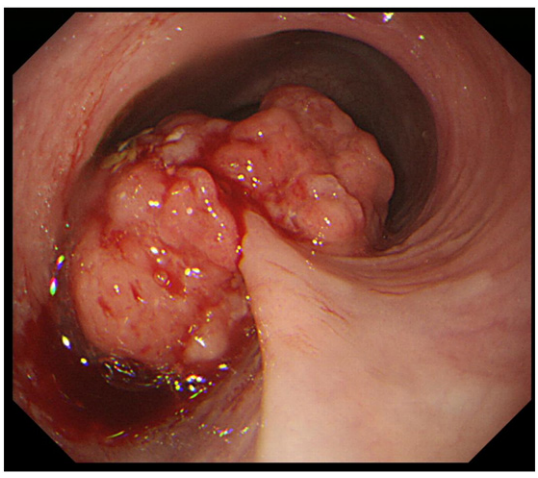

Fig. 1 Esophageal endoscopy. A polyp with stalk is seen. The polyp measures 2 × 2 × 2.5 cm.

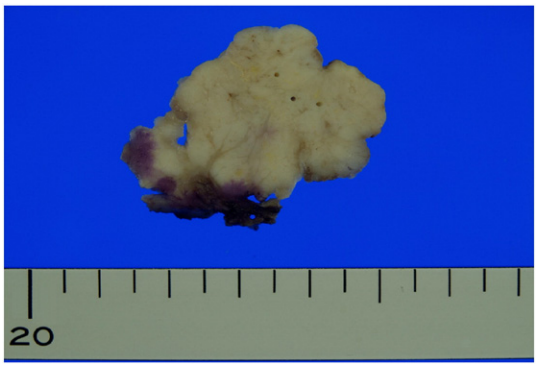

Fig. 2 Gross pathologic findings. The polyp is solid tumor with white cut surface.

carcinomatous changes. The tumor cells were composed of basaloid malignant cells with hyperchromatic nuclei, scant cytoplasm, and basophilic cytoplasm (Fig. 3A, B, C and D). Many mitotic figures were recognized. Characteristically, foci of comedonecrosis were scattered (Fig. 3A and B). Areas of squamous differentiation (Fig. 3C) and glandular differentiation (Fig. 3D) were also scattered. The pathological diagnosis was BSCC of the esophagus. According to WHO blue book [1], it was typical BSCC-E.

An immunohistochemical analysis was performed by the Dako Envision method (Dako Corp, Glostrup, Denmark), as previously reported [28,29]. Immunohistochemically, the tumor cells are positive for pancytokeratin (PCK) CAM5.2 (Fig. 4A), PCK AE1/3, cytokeratin (CK) 7, KIT (Fig. 4B), CEA, CA19-9 (Fig. 4C), EMA, Ki-67 (labeling index = 80%) (Fig. 4D). The tumor cells were negative for CK20, PDGFRA, neuron-specific enolase (NSE), vimentin, estrogen receptor, p53 protein, chromogranin, synaptophysin, CD56, and TTF-1.

A molecular genetic analysis of *KIT* gene (exons 9, 11, 13, and 17) and *PDGFRA* (exons 12 and 18) gene was performed by the PCR direct sequencing method, as previously reported [12–27]. The exons of both genes were selected because they are frequent mutation sites [6–27]. In brief, genomic DNA was extracted from paraffin blocks with proteinase K digestion and phenol/chloroform extraction, and subjected to PCR for 40 cycles (94 °C for one minute, 52 °C for one minute, 72 °C for one minute), using a thermal cycler (GeneAmp PCR system 9700, Applied Biosystems, ABI, CA). The annealing temperature was 53 °C. PCR products were extracted, and subjected to a computed automatic DNA sequencer (ABI PRIZM 3100 Genetic Analyzer, Applied Biosystems, ABI, CA).

The retrospective genetic analysis using PCR-direct sequencing method in paraffin sections identified no mutations of *KIT* (exons 9, 11, 13 and 17) and *PDGFRA* (exons 12 and 18) genes in the present tumor.

After the ESD, re-endoscopy was performed, and it did not reveal tumor. However, biopsy showed a few carcinoma