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A case of prostatic adenocarcinoma with Paneth cell-like appearance

Yasuhiro Nakamura[1], Fumiyoshi Fujishima[1], Mika Watanabe[1], Shinji Taniuchi[1], Kazuyuki Ishida[1], Shigeto Ishidoya[2], Yoichi Arai[2], Hironobu Sasano[1]

[1]Department of Pathology, Tohoku University School of Medicine, Sendai, Japan
[2]Department of Urology, Tohoku University School of Medicine, Sendai, Japan

Paneth cell-like appearance of prostatic carcinoma cells with eosinophilic cytoplasmic granules is rarely reported, and is known to be associated with neuroendocrine differentiation of carcinoma cells. We report a case of prostatic adenocarcinoma with Paneth cell-like appearance that was localized next to conventional adenocarcinoma, and demonstrate its neuroendocrine differentiation by using immunohistochemical analysis. Paneth cell-like appearance of prostatic carcinoma cells should be recognized and considered as a sign of neuroendocrine differentiation due to the possible association with resistance to hormone therapy.

Key words: prostatic adenocarcinoma, Paneth cell-like feature, neuroendocrine differentiation.

Introduction

Paneth cell-like appearance of prostatic adenocarcinoma is considered to be a feature of neuroendocrine differentiation characterized by carcinoma cells with prominent eosinophilic cytoplasmic granules [1-8]. Herein, we report a case of prostatic adenocarcinoma admixed with Paneth cell-like neuroendocrine differentiation localized next to with conventional adenocarcinoma evaluated by using the extensive mapping analysis and immunohistochemical method.

Case report

A 55-year-old Japanese man appeared to have a high serum prostatic-specific antigen (PSA) level (17.8 ng/ml) in his regular physical examination. A digital examination and needle biopsy of the prostate were performed. A subsequent histological examination revealed moderately-well differentiated adenocarcinoma. The patient underwent radical prostatectomy at the Tohoku University Hospital.

The extensive mapping analysis of the resected specimens revealed the diffuse spread of the tumour in the bilateral lobes (Fig. 1). In addition, tumour tissues consisted of two different types of carcinoma:

- well to moderately differentiated acinar adenocarcinoma with numerous crystalloids, showing perineural and vascular invasion, and extending through the prostatic capsule (Fig. 1 and 2);
- glandular, cribriform, trabecular and patchy isolated structures formed by round to pyramidal cells with markedly eosinophilic granular cytoplasm (Fig. 1 and 3).

The latter component was consistent with pathological features of Paneth cell-like carcinoma cells in the prostate gland [1-8]. Immunohistochemical analysis demonstrated that these Paneth cell-like carcinoma cells were positive for chromogranin A, synaptophysin, and negative for androgen receptor (AR) (Fig. 4).

Discussion

Prostatic pathology with Paneth cell-like appearance was considered rare in both benign and malignant prostatic diseases [1-8]. Paneth cell-like changes were reported to be detected in 10% of prostatic adenocarcinomas and were usually composed of only rare foci of scattered cells and/or small clus-

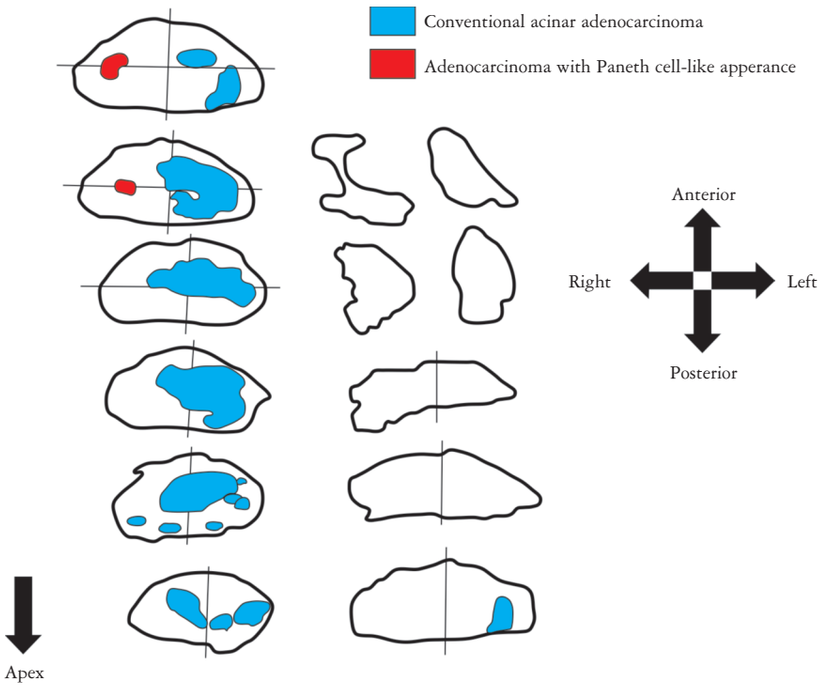

Fig. 1. Tumour mapping figure showing localization of conventional adenocarcinoma (blue) and adenocarcinoma with Paneth cell-like appearance (red) in the surgical specimen of the prostate

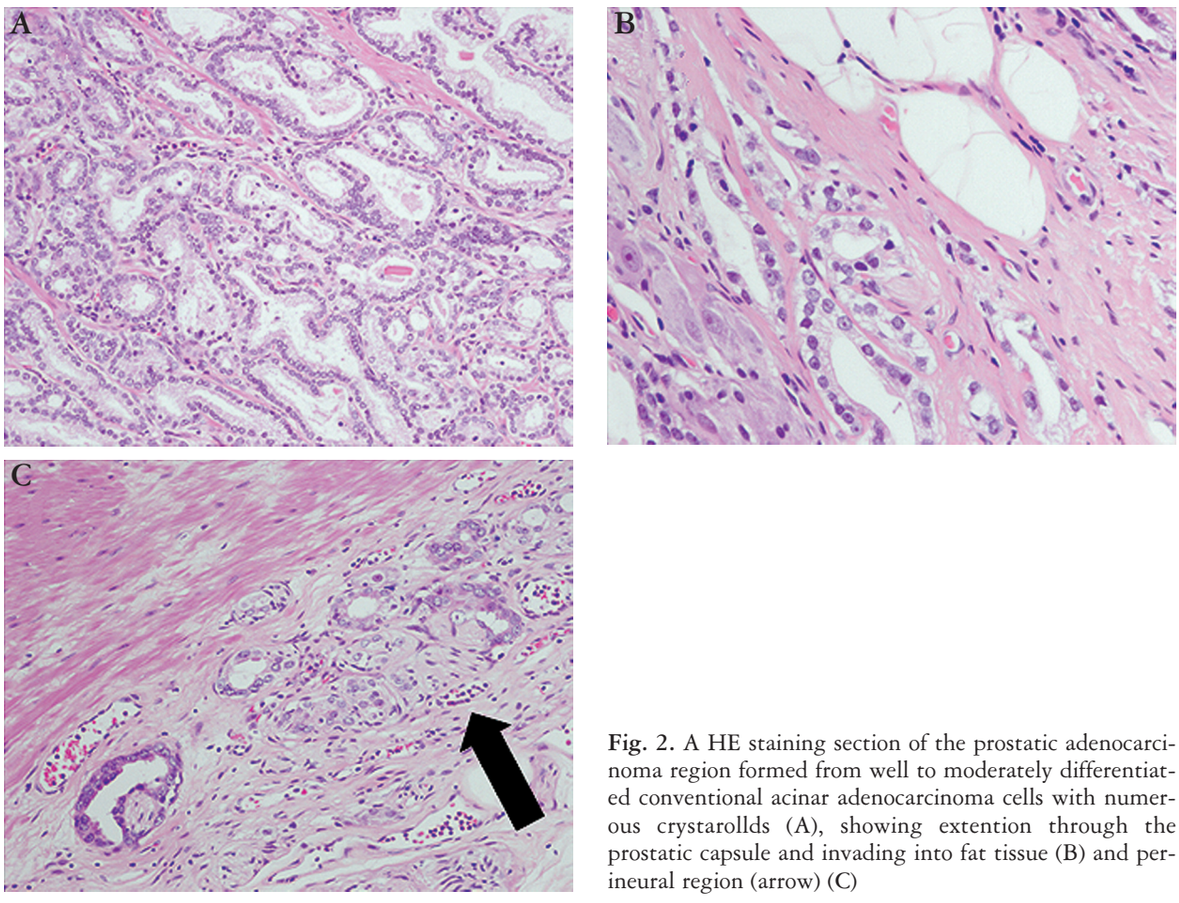

Fig. 2. A HE staining section of the prostatic adenocarcinoma region formed from well to moderately differentiated conventional acinar adenocarcinoma cells with numerous crystarollds (A), showing extention through the prostatic capsule and invading into fat tissue (B) and perineural region (arrow) (C)

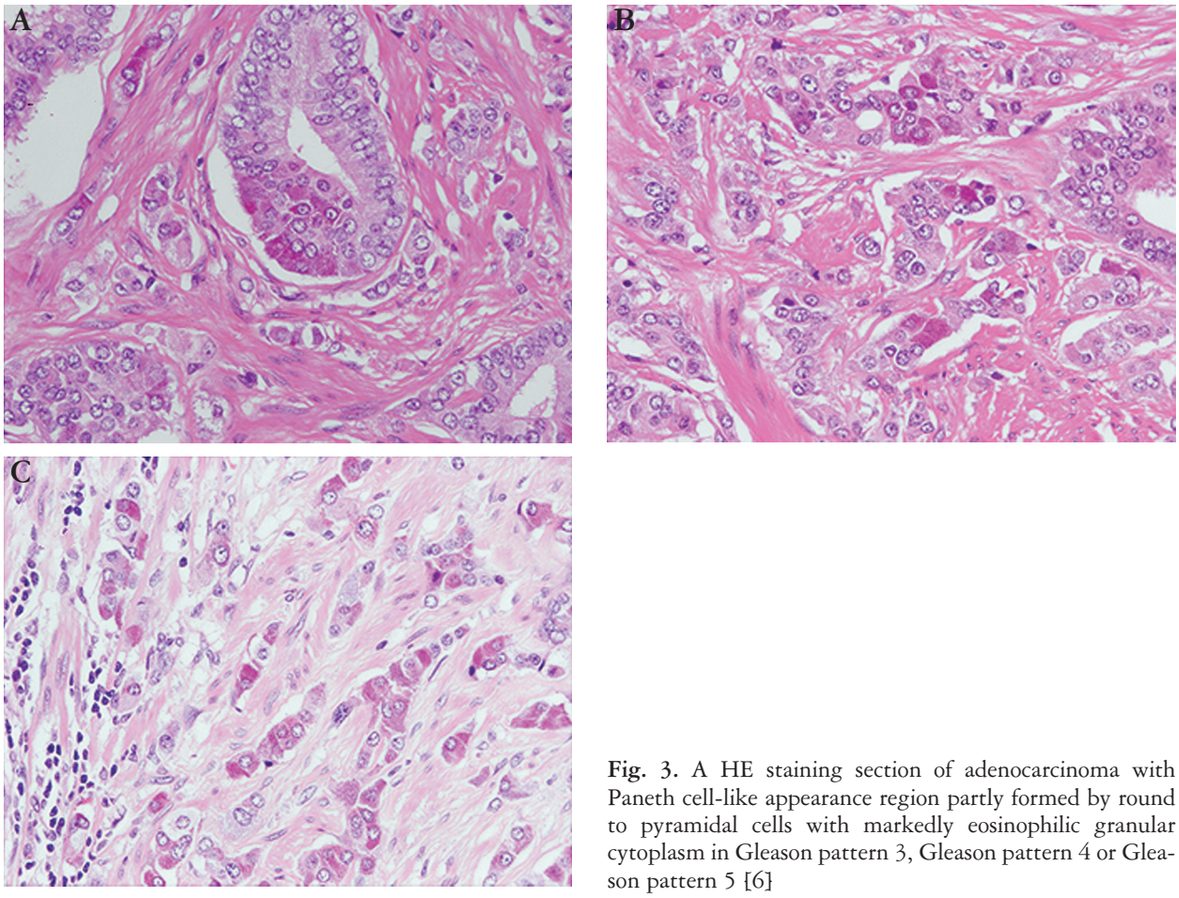

Fig. 3. A HE staining section of adenocarcinoma with Paneth cell-like appearance region partly formed by round to pyramidal cells with markedly eosinophilic granular cytoplasm in Gleason pattern 3, Gleason pattern 4 or Gleason pattern 5 [6]

ters of tumour cells [5]. Prostatic adenocarcinoma with Paneth cell-like features has been previously detected either in Gleason pattern 3, Gleason pattern 4 or Gleason pattern 5, which are consistent with the present case [6].

Eosinophilic granules in Paneth cell-like appearance were reported negative for lysozyme, making them distinct from the true Paneth cells of the small intestine [1, 4-6]. Prostatic adenocarcinoma with Paneth cell-like appearance was reported to be diffusely positive for neuroendocrine markers such as chromogranin, synaptophysin and serotonin, consistent with our present report [6]. Neuroendocrine cells (NECs) in prostatic adenocarcinoma are generally considered a feature of androgen insensitivity due to the absence of ARs as shown in our present case [6]. Results of previous studies have suggested that NECs may play an important role in prostatic cancer development and progression through actions of various peptides produced and secreted in these cells in a paracrine manner via an androgen-independent pathway [6, 9-11]. However, prostatic adenocarcinoma with neuroendocrine differentiation ranged from focal NECs in conventional adenocarcinoma, to carcinoid tumour and small cell carcinoma/poorly differentiated neuroendocrine carcinoma [6, 12]. Tamas *et al*. previously suggested that in cases with Paneth cell-like NECs, only the conventional adenocarcinoma component should be assigned a Gleason score [6]. In addition, they also proposed that in cases in which the entire tumour is composed of Paneth cell-like cells with the absence of glandular differentiation, the tumours should not be assigned a Gleason score and a comment should be provided to urologists as to the generally favourable prognosis of this morphologic pattern of neuroendocrine differentiation [6]. However, it awaits further examination to clarify the association with the presence of prostatic adenocarcinoma with Paneth cell-like appearance and eventual clinical outcome for the patients.

In our case, the tumour area formed by carcinoma cells with Paneth cell-like appearance occupied a small area and was separately located from the areas of conventional acinar adenocarcinoma. We could not find previous studies describing in detail the colocalization patterns of these two different types of carcinoma cells. The mapping of the resected prostate glands requires labour intensiveness but an examination of the entire tissue of the surgical

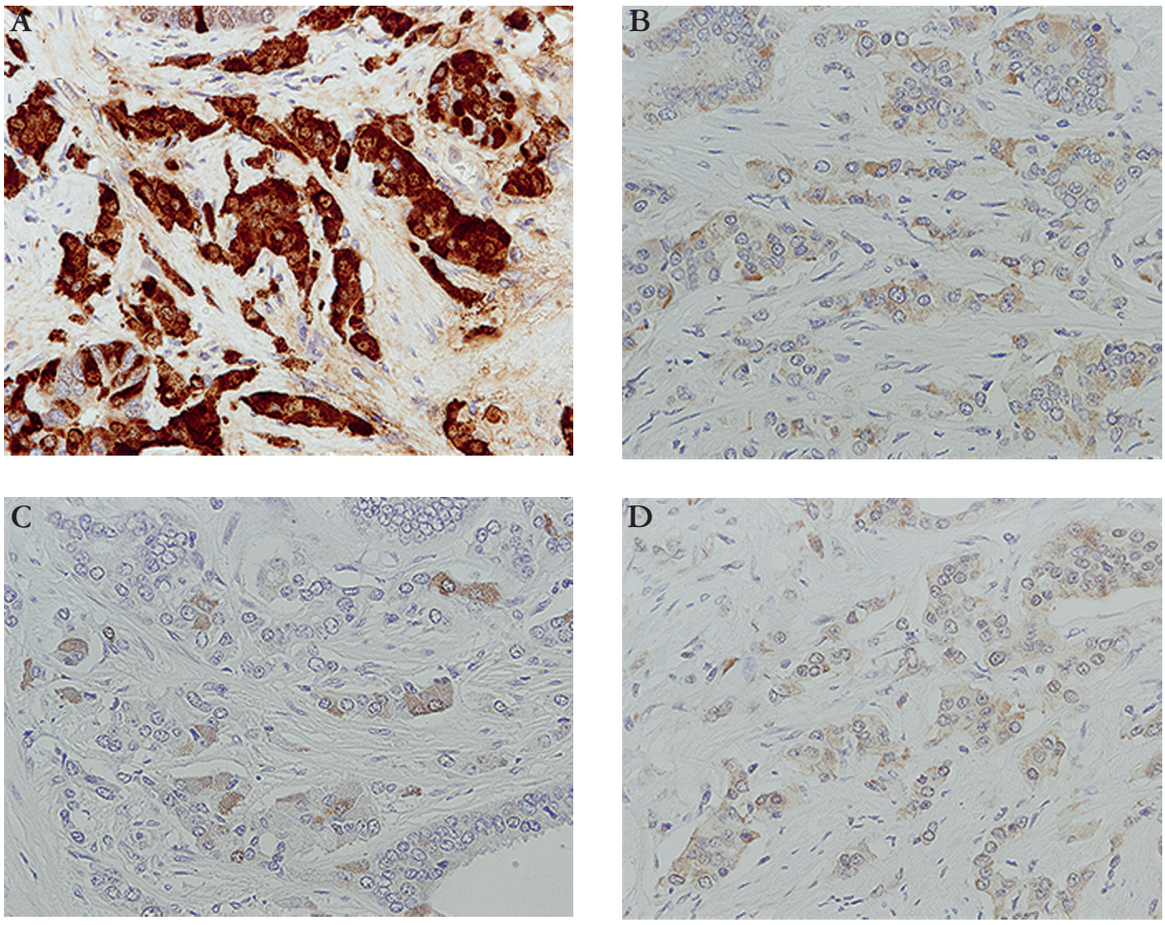

Fig. 4. Representative immunohistochemical staining sections of prostatic adenocarcinoma with Paneth cell-like appearance shows that these cells were positive for chromogranin A (A), synaptophysin (B), serotonin (C) and negative for AR (D)

prostatic specimen is very important in order to detect the presence of carcinoma cells associated with different characters.

In summary, we report a case of prostate carcinoma demonstrating Paneth cell-like neuroendocrine differentiation coexisting with conventional adenocarcinoma. Pathologists should carefully examine whether such a small area of carcinoma with neuroendocrine differentiation exists together with conventional acinar adenocarcinoma regarding possible association with resistance to hormone therapy.

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Address for correspondence

Yasuhiro Nakamura, MD
Department of Pathology
Tohoku University School of Medicine
2-1 Seiryo-machi, Aoba-ku, Sendai
980-8575 Japan
tel. +81-22-717-8050
fax +81-22-717-8051
e-mail: yasu-naka@patholo2.med.tohoku.ac.jp