Osseous metaplasia in rectal and appendicular carcinoma: A diagnostic dilemma?

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ABSTRACT

Heterotopic bone formation also known as osseous metaplasia is an uncommon finding in benign and malignant gastrointestinal tumors. It has been described in adenocarcinoma lung, carcinoma breast, thyroid, parotid and pancreas. The overall incidence is approximately 0.4% as suggested by Dukes. We present two cases of rectal and appendicular mucinous adenocarcinoma with osseous metaplasia.

Keywords: Osseous metaplasia, adenocarcinoma, rectum, appendix.

INTRODUCTION

Heterotopic bone formation has been reported in malignancies involving the kidneys, liver, breast, and skin.[1] Ossification in the gastrointestinal tract is extremely rare; with very few cases reported in the literature.[2] Dukes was the first to describe ossification in rectal carcinoma in 1939.[3] With due written informed consent from both the patient we present these two cases.

Case 1

A sixty year old male was admitted for rectal bleeding for past five months. His clinical and ultrasound examination showed a large rectal mass for which he underwent Abdominoperineal resection.Externally rectum was dilated. On cutting open, a large, polypoid, grey white mass measuring 6 × 6 × 4 cm was seen infiltrating the wall and extending up to the serosa, reaching up to the anal verge (Figure 1). Five lymph nodes were identified largest measured 0.8 cm in diameter, grossly and microscopically did not show metastasis. Histopathological examination showed ulcerated rectal mucosa with a tumor composed of cuboidal to columnar cells with vesicular nuclei and abundant amount of eosinophilic cytoplasm arranged in glandular pattern with pseudo-stratification. Extravasation of mucin was seen. Extensive foci of well formed mature bony spicules were seen in midst of glands (Figure 2). A diagnosis of mucin secreting adenocarcinomas with osseous metaplasia, stage II (Dukes Collins staging system) was rendered. However there was no lymph node or bony metastasis.

Figure 1. Gross photograph illustrating a large, ulceroproliferative, grey white, rectal mass extending up to the serosa and reaching the anal verge.
A thirty-five-year-old lady underwent emergency surgical exploration for acute abdomen. She had pain in the right iliac fossa since five months. Fluid cytology was positive for malignant cells. The resected appendicular lump measured 8 × 6 × 4.5 cm and was covered with exudate. Appendix could not be identified grossly. No lymph nodes were identified. Histopathological study showed mucin-secreting adenocarcinoma with foci of osseous metaplasia (Figure 3).

**DISCUSSION**

Heterotopic bone formation is usually observed in tumors producing abundant mucin. As postulated by Rhone and Horowitz, ossification might result from metaplasia of pluripotent mesenchymal cells into osteoblasts which differentiate and synthesize ground substance and collagen. Al-Daraji et al. observed osseous metaplasia in association with tubular adenoma of colon, have stated, that ossification might result from stromal activation associated with human-host interface or could be the result of unidentified factors released from these cells. Randall et al. have suggested that metastatic colonic carcinoma can promote heterotopic ossification. The average age of these patients was 56 yrs (range 36–72) and male to female ratio was 5:7. Our cases presented at third and fourth decades of life. Grossly, the tumors can ulcerate, fungate or infiltrate and have a mucinous cut surface with areas of calcification and metaplastic bone formation. Microscopically they are characterized by mucinous adenocarcinomas with the heterotopic bone consisting of osteoblasts surrounding irregular deposits of mineralized osteoid or spicules of mature bone rimmed by a layer of scattered osteoblasts. Both of our cases showed similar morphologic features.

The presence of osseous tissue in appendicular and rectal carcinoma might be confused with adenocarcinoma invading into bone or with a metaplastic carcinoma. Thorough clinical examination and absence of sarcomatous elements ruled out these two differential diagnoses in the present cases. Metaplastic ossification does not alter clinical features, prognosis or the response to chemo/radiotherapy. Treatment remains same as conventional adenocarcinoma.

To conclude although osseous metaplasia is of no prognostic significance, an awareness of the phenomenon is important, in order to prevent the over diagnosis of bone invasion by carcinoma or misdiagnosing it as metaplastic carcinoma.

**REFERENCES**