ABSTRACT

Heterotopic bone formation is a rare occurrence in malignant tumors of gastrointestinal tract and female reproductive tract. Formation of bone marrow in heterotopic bone is even more uncommon. We herein report a case of Krukenburg Tumor with heterotopic bone formation in the Liver. Biopsy specimens of a 45 year old female were received at our lab. The accompanying clinical notes stated that the larger specimen was a metastatic bilateral ovarian tumor and a tiny specimen in a separate container was a biopsy from the Liver. The histological examination of the resected specimen showed Signet Ring Adenocarcinoma. While the histology of the Liver Biopsy showed normal hepatic tissue with focal area of necrosis containing heterotopic bone. In this case report, we describe this rare phenomenon and briefly review the pertinent literature regarding Krukenburg Tumor with heterotopic bone formation in the Liver.

KEYWORDS: Krukenburg Tumor, Heterotopic bone, Osseous Metaplasia.

INTRODUCTION

The formation of normal bone in any type of tumor especially the mucin secreting adenocarcinomas is a rare entity. The pathogenesis of such heterotopic bone formation in Krukenburg Tumor is not well known. Therefore, Awareness of this condition is necessary to avoid over diagnosis of bone invasion in malignant tumors. The dystrophic calcification is mostly seen in necrotic tumorous areas. The formation of mature bone i.e osseous metaplasia or heterotopic bone formation is a rare phenomenon. The said phenomenon refers to formation of mature benign bone elements in the stroma of neoplasm. In case of malignancies, the osseous metaplasia can be present in adenocarcinomas of gastrointestinal tract, lung, breast, thyroid and pancreas. The osseous metaplasia is mostly an incidental microscopic finding and does not harbors any clinical or prognostic role in tumor biology. In cases of malignant conditions, findings suggestive of bone trabeculae should always be evaluated carefully prior labeling the lesion as Osseous Metaplasia.

CASE REPORT

A 45 year old female presented with pelvic mass. Her ultrasound revealed an ovarian mass on left side measuring 19 cm in diameter. Also a space occupying lesion was found in the right lobe of liver measuring 6mm in diameter. It was considered clinically as metastatic tumor. The patient also had mild ascites. The patient underwent laparotomy and the tumor was resected. Omental tumor deposits were also present. We received two specimens labeled as Ovarian mass and Solitary Liver nodule respectively; in two separate containers with relevant clinical notes from a Private Laboratory in Mianwali. The ovarian mass on gross examination measured 18x12x8 cm. The cut surface was grayish white, solid and firm. The specimen from liver consisted of a soft tissue fragment measuring 1.5x1x1 cm. The cut surface revealed a bony hard nodule measuring 0.6 cm in diameter. It was submitted entirely after decalcification.

The histological examination of the ovarian mass showed Signet Ring Adenocarcinoma. While the histology of the Liver biopsy showed hepatic tissue with areas of necrosis showing heterotopic bone formation. Fig - 1. The lamellar bone trabeculae were well formed separated by fat spaces containing bone marrow elements. Fig - 2. Wide areas of tumor necrosis were seen in the vicinity of bone trabeculae. Some areas showing calcification and transition to formation of bone were also seen. Fig - 3.

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Krukenburg tumor is commonly associated with primary gastric adenocarcinoma but co- incidental heterotopic bone and marrow elements are rarely seen. Heterotopic bone has been reported in primary and metastatic gastrointestinal tumors including carcinoma of stomach, appendix and colorectum. The pathogenesis of heterotopic bone formation in such cases is not completely understood. A number of hypotheses have been suggested, including a metaplastic changes leading to necrosis and degeneration ultimately forming a bone by tumor cells. Osseous metaplasia is usually seen secondarily to chronic inflammation, necrosis or ischemia in the surrounding tissue as a result there is transformation into osteoblasts. Supporting this theory, heterotopic bone is most likely to be found in necrotic tumors, the mucin pool and stroma. Imai N et al narrated in his study findings that bone morphogenetic protein by gastrointestinal glandular tumor cells might play an important role in heterotopic ossification. Heterotopic bone is rarely present in the gastrointestinal tract, including benign and malignant epithelial tumors. Formation of marrow elements in this bone is even a rarer phenomenon. The recognition of bone elements in a tumor as a metaplastic phenomenon is essential to avoid confusion with a more sinister lesion like carcinosarcoma or bone forming sarcoma. Further studies are necessary to determine the factors that play a role in heterotopic bone formation in gastrointestinal tumors, and to confirm the impact of this bone formation on the patient outcome.

REFERENCES