

OSSEOUS METAPLASIA IN ADENOCARCINOMA OF SMALL BOWEL - CASE REPORT**Dr. Marwa H. Yagoub¹, Dr. Mohammed H. M. Ali¹, Dr. Ibrahim Abdallah², Tagwa Hamdan Hussein¹,
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ABSTRACT

Small Bowel Adenocarcinoma of in a 70 -year old male who presented with acute intestinal obstruction, treated with Resection and anastomosis of the involved bowel. Histopathological examination confirmed the diagnosis of well-differentiated adenocarcinoma, With a rare osseous metaplasia which is a rare incidental finding in all tumors. Few cases of osseous metaplasia in gastrointestinal tract tumors have been reported. The pathogenesis of this condition is not yet known but believed to be related to certain biochemical messengers that stimulate uncommitted mesenchymal stromal cells.

1-INTRODUCTION

Primary adenocarcinomas of the small intestine are rare and account for 2% of all gastrointestinal tract tumors.^[1,2] The rarity of adenocarcinoma arising in the small bowel is largely unexplained but is most likely due to a combination of several factors.^[3] There are several subtypes of small bowel tumours. Of this, adenocarcinoma accounts for 40%, Others include Carcinoid(35-42%), lymphomas(15-20%) and gastrointestinal stromal tumors (10-15%).^[4,5,6] However, there are is an increasing incidence of carcinoids.^[4] Risk factors for the disease include alcohol intake⁵, cigarette smoking⁶, and high sugar consumption. Predisposing conditions include Peutz-Jerghers syndrome, Crohn's disease and celiac disease. Our patient had adenocarcinoma of the small bowel with Osseous Metaplasia (OM), which is known as heterotopic bone formation, an incidental histopathological entity that is usually found in association with different malignant and benign neoplasms. It is an uncommon phenomenon with an estimated overall incidence of 0.4% in malignant Tumors.

It has been reported to occur in adenocarcinomas, of different organs including gastrointestinal tract, lungs, breast, thyroid, pancreas, parotid and kidney.^[8-9] Besides malignancies, ossification has also been observed in benign colonic polyps, mucocèles of appendix and gastric carcinoid. Osseous metaplasia of gastrointestinal tract was first described by Dukes in 1939. The condition is clinically and prognostic ally insignificant and very little is known about the condition. Here we present a

case of metastatic adenocarcinoma of small bowel with multiple foci of osseous metaplasia in an old male.

CASE REPORT

A 70 years old male presented to the ER with severe yellow vomiting, abdominal pain, distension and constipation for 25days.

Physical examination: patient looks ill, not pale or jaundiced Abdominal examination revealed hard umbilical nodule.

Investigations on admission: TWBC $13.9 \times 10^9/\mu\text{l}$ (mainly neutrophils), RBC $6.2 \times 10^6/\mu\text{l}$, HB 14.2 g/dl, RBG 112 g/dl, urea 31 mmol/l, creatinine 0.77 $\mu\text{mol/l}$, Na 139 mmol/l, K 3.2 mmol/l.

CT abdomen revealed gross dilatation of small bowel loops, suggestive of small bowel obstruction. Small infra-umbilical hernia, containing omentum and small bowel loop is noted.

A laparotomy was done and the surgeon noticed massive adhesions with multiple round masses of different sizes attached along the small bowel with large hard nodule attached to the abdominal wall.

The patient had past medical history of suprapubic hernia repair on 20/6/2019, after which patient discharged on good condition, after two weeks patient relapsed and proximal jejunal tumor was resected and anastomoses

was done on 16/9/2019.

PATHOLOGIC FEATURES

Gross appearance

Two round to oval hard masses were resected from the anterior abdominal wall, measuring (8.5x6.5x4.5 cm), this mass attached with (3.5x2 cm) of mesentery. The second mass measures (6.5x3.5x3 cm).

Cut section of the large mass shows whitish lobulated nodule measuring (6x2.5 cm) with smooth surface. The smaller mass shows tan white color with yellow streaks surface. Sections were taken from representative areas of

both masses and all mesentery was submitted.

Microscopic examination

Sections from the masses showed a tumor composed of infiltrating disrupted glands within a desmoplastic stroma, foci of osteoid material were identified (figure1). Interestingly the smaller mass did not show osseous metaplasia (figure2).

Immunohistochemistry revealed CK7 positive in tumor cells (figure3), CK20 negative (figure4) favoring the primary neoplasm in upper gastrointestinal tract.

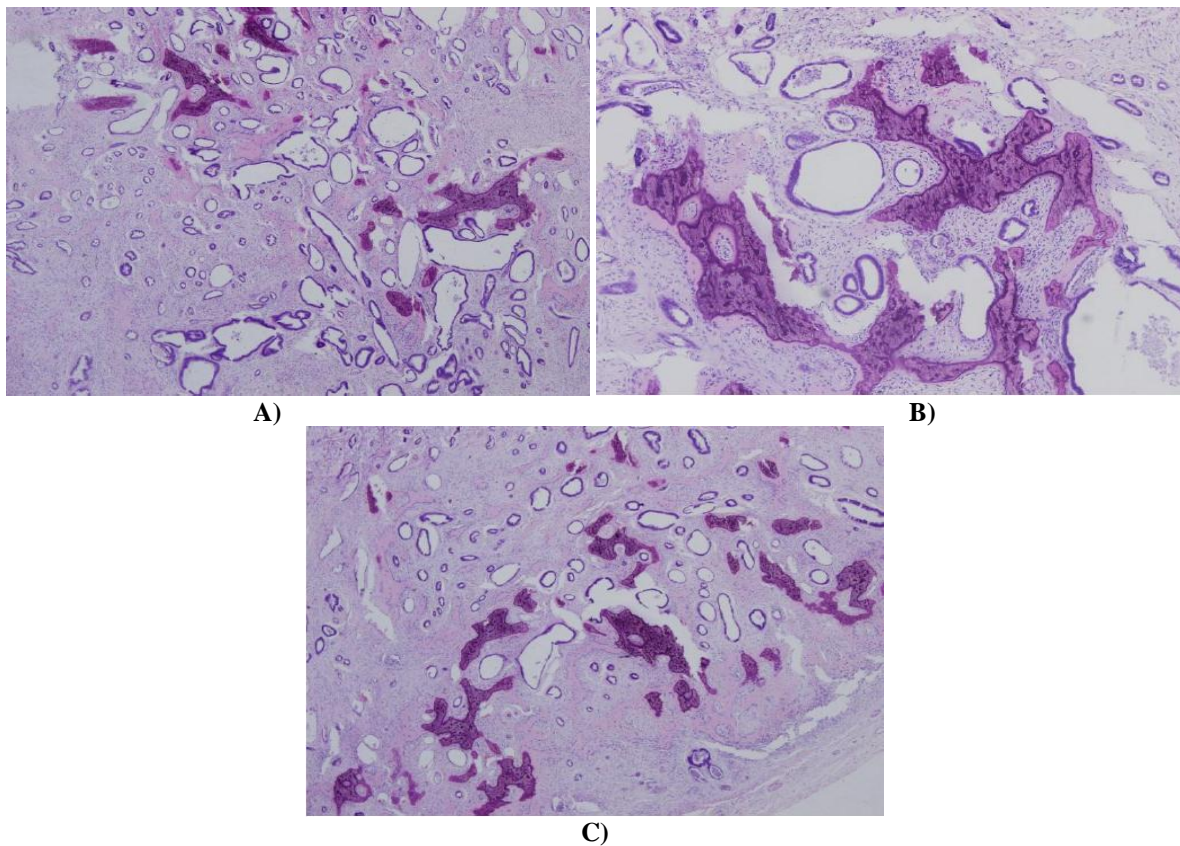


Figure 1: foci of osseous metaplasia within the tumor A&B) low power view (H&E). C) high power (H&E).

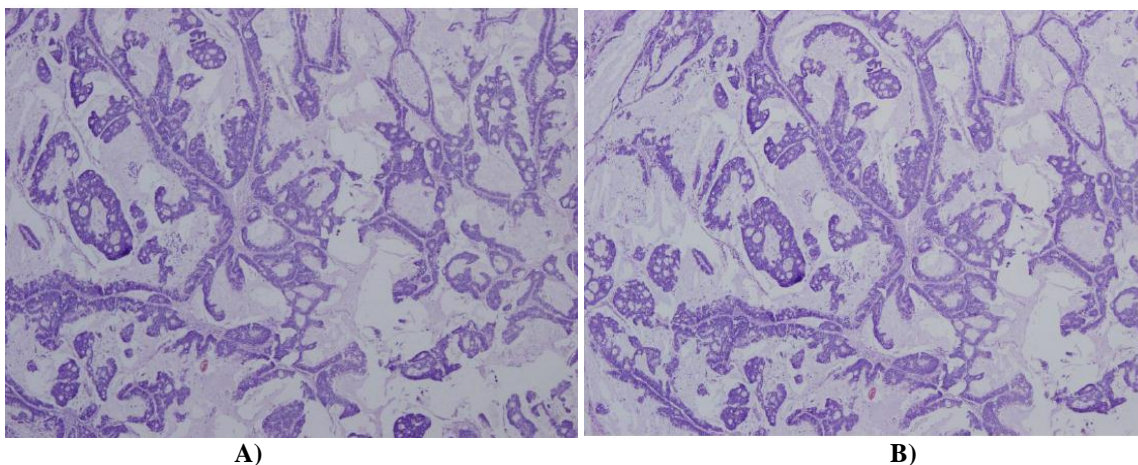


Figure 2: A&B shows tumor featuring adenocarcinoma with extracellular mucin without osseous metaplasia. (Low power with H&E).

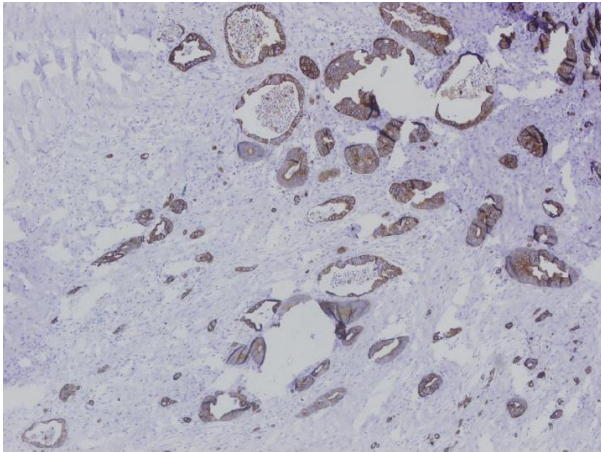


Figure 3: tumor cells show reactivity to CK7 (power 6x).

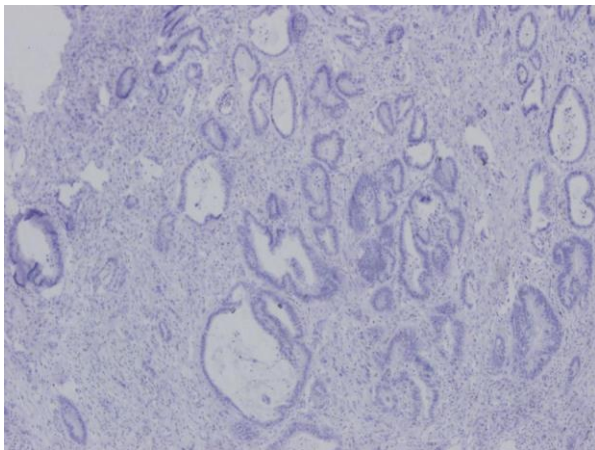


Figure 4: tumor cells are -ve to CK20 (power 6x).

DISCUSSION

Adenocarcinoma of the small bowel is very rare with its worldwide incidence is 1/100000 population [10]. Compared with colorectal cancer, its incidence is about 100 fold less despite having a larger surface area and there are higher rates in men than women.^[11] Many theories of this rarity include the rapid transit time of intestinal content in the small bowel, limiting the time of contact between dietary carcinogens, the mucosa, the presence of immunoglobulin A (IGA) and lymphoid aggregates.^[12] There are risk factors associated with small bowel cancers such as dietary factors like high intake of refined carbohydrate, sugar, red meat, which all increase risk, while there is reduced risk in consumption of coffee, vegetables and fruits.^[13, 14] Concerning osseous metaplasia which is extremely rare in the gastrointestinal tract, not many cases were reported since the metaplasia was first described by Duke in 1939, but most of the cases of osseous metaplasia were in primary adenocarcinoma and all of them were reported in the caecum, rectum, sigmoid colon, colorectal and transverse colon. On the other hand, small bowel adenocarcinoma is extremely rare with incidence of less than one per 100000 population globally.

After reviewing the pathology literature no case reports

were found of heterotopic ossification with small bowel adenocarcinoma.

The mechanism resulting in osseous metaplasia is not reached yet, but two hypotheses are being studied. In recent studies some authors believed that osteoblastic metaplasia of tumor cells resulted in heterotopic ossification, on the other hand others believed that the heterotopic ossification is due to the metaplasia of stromal pluripotent cell into an osteoblast by factors secreted by the cancer cells. The later hypothesis is more widely accepted. Also, concerning the later hypothesis it is believed that bone morphogenetic proteins (BMPs) are part of the factors secreted by tumor cells leading to heterogeneous ossification so it is strongly associated with this phenomena.

CONCLUSION

Here we reported the first rare case that includes two extremely rare conditions that are metastatic small bowel adenocarcinoma and osseous metaplasia. Most authors stated that osseous metaplasia in adenocarcinoma do not change the course, presentation, prognosis or management of the patient's condition. Pathologists should be aware of osseous metaplasia in order to avoid misdiagnosis of osseous carcinoma or carcinosarcoma.

REFERENCES

1. Chaiyasate K, Jain AK, Cheung LY, Jacobs MJ, Mittal VK; prognostic factors in primary adenocarcinoma of the small intestine: 13-year single institution experience. *World J Surg Oncol*, 2008; 31: 6-12.
2. Choi YJ, Jung SW, Um JW, Lee ES, Koo JS, Yim HJ, Lee SW, Choi JH; Small bowel carcinoma in young patient detected by double-balloon enteroscopy. *Korean J Gastroenterol*, 2011; 58(4): 217-220.
3. Lioe TF, Biggart JD; Primary adenocarcinoma of the jejunum and ileum: clinicopathological review of 25 cases. *J Clin Pathol*,
4. Thomas Aparicio, Aziz Zaan, Magali Svrcak, Pierre LaurentPuig, Nicolas Carrere, Sylvain Manfredi, Christophe Locher, Pauline Afchain. *Small bowel adenocarcinoma: Epidemiology, risk factors, diagnosis and treatment. Digestive and Liver Disease*, 2014; 46: 97-104, 1990; 43(7): 533-536.
5. Abiodun Christopher Jemilohun, Alaba Moses Adesina, Mustapha Akanji Ajani, Theophilus Oludare Ajiro. *Small Bowel Adenocarcinoma in a Nigerian Man: A Case Report. International Journal of Medical and Pharmaceutical Case Reports*, 2017; 10(3): 1-7.
6. Overman MJ. *Rare but real: Management of small bowel adenocarcinoma. Am Soc Clin Oncol Educ Book*, 2013; 189-93.
7. Dukes CE. *Ossification in rectal cancer: (Section of Surgery: Sub-Section of Proctology). Proc R Soc Med.*, 1939; 32(11): 1489-94.
8. Byard RW, Thomas MJ. *Osseous metaplasia within*

- Tumors. A review of 11cases. *Ann Pathol*, 1988; 8(1): 64-66.
9. Shimazaki J, Takemura A, Nishida K, Kajiyama H, Shimoda M, Suzuki S. Heterotopic ossification in rectal carcinoma: report of a case and review of the literature. *Case Rep Oncol*, 2016; 9(3): 698-704.
 10. Pan SY, Morrison H. Epidemiology of cancer of the small intestine. *World J Gastrointest Oncol*, 2011; 3(3): 33-42.
 11. Haselkorn T, Whittemore AS, Lilienfeld DE. Incidence of small bowel cancer in the United States and worldwide: geographic, temporal, and racial differences. *Cancer Causes Control*, Sep, 2005; 16(7): 781-7.
 12. Rachael A. Safyana and Alfred I. Neugut. Anti-EGFR Therapy in Small Bowel Adenocarcinoma. *The Oncologist*, March, 2018; 23(3): 275-276.
 13. Thomas Aparicioa, Aziz Zaanana, Magali Svrcek, Pierre LaurentPuig, Nicolas Carrere, Sylvain Manfredi, Christophe Locher, Pauline Afchain. Small bowel adenocarcinoma: Epidemiology, risk factors, diagnosis and treatment. *Digestive and Liver Disease*, 2014; 46: 97-104.
 14. Negri E, Bosetti C, La Vecchia C, Fioretti F, Conti E, Franceschi S. Risk factors for adenocarcinoma of the small intestine. *International J of cancer*, 1999; 82(2): 171-4.