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RESEARCH ARTICLE

**CASE REPORT OF 64-YEAR-OLD MALE PATIENT WITH GASTRIC ADENOCARCINOMA
 PRESENTED AS PATHOLOGICAL NECK OF FEMUR FRACTURE**

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Abstract

One third of bone metastatic cases experience pathological fractures, which is a bad prognostic factor. Common sites of long bone pathologic fracture include the femur, tibia, and humerus. This article reviews a detailed history, examination and investigations of 64-year-old male patient with gastric adenocarcinoma who presented with a pathological neck of femur fracture. The present case aims to highlight the occasional involvement of bone metastasis amongst gastric cancer patients presenting as a pathological fracture that was the only presenting symptom without gastrointestinal symptoms.

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Introduction:-

Bone metastasis are the frequent complication in patients with advanced cancer and may occur in every type of cancer.⁽¹⁾ The most common bone metastasis come from the breast, prostate, renal, thyroid and lung.⁽²⁾ The exact mechanism of bone metastasis is not fully understood, researchers indicated that the dysregulation of the normal bone remodeling process is the mechanism behind the formation of bone metastatic disease.⁽³⁾ There are two types of bone metastatic lesions either osteolytic, characterized by destruction of normal bone, or osteoblastic lesions with deposition of new bone.^(2,3)

Bone metastases can cause a wide range of symptoms that can impair the quality of life or decrease the survival rate.⁽⁴⁾ Majority of the symptoms are uncontrolled pain, pathologic fractures and epidural spinal cord compression.⁽⁵⁾ Pathologic fractures are frequent in patients with bone metastases, and its incidence reaches up to 29 percent of all bone metastases.^(6,7) Minimal trauma may cause pathologic fractures especially at the long bones of the femur, tibia, or humerus.⁽⁸⁾

Globally, gastric cancer is the fifth most common cancer and the fourth leading cause of death.⁽⁹⁾ Incidence of gastric cancer in Saudi Arabia is 3.14 % in both genders while the mortality is 2.68 % in both genders.⁽¹⁰⁾ the mortality rate is attributed to the patients' late presentation in addition to the high lethal nature of the disease. Moreover, bone metastasis rarely present as a primary presentation of gastric malignancy.⁽¹¹⁾ this is due to the fact that bone metastasis from gastric cancer present as a late stage or as a recurrence. The prognosis of patients with bone metastases is poor, the median survival rate is about 5 months after the appearance of bone lesions, and 3.5 years has been the longest survival period reported in the literature.^(12,13,14)

However, bone metastases are not the same as cancer that originates from the bone. Therefore, treating metastatic cancer that has spread to the bones is different from treating cancers that originate in the bones. This is the case

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report with detailed history, examination of 64-year-old male patient with Gastric Adenocarcinoma presented as pathological neck of femur fracture. The present case of gastric cancer aims to highlight the occasional involvement of bone metastasis and associated femur fracture, which was the first symptom of this type of visceral cancer.

Report of the case:**Clinical presentation and history:**

A 64-year-old male known to have hypertension and diabetes. Patient presented to our emergency room with left hip pain and was unable to weight bear after falling down on his left hip. He denied any weakness, numbness or tingling, fecal or urinary incontinence. He was not on medications and had no surgical history. He is an ex smoker and had stopped smoking 10 years ago.

Examination:

Patient was vitally stable and conscious. Physical examination revealed tenderness over the left hip associated with limited range of motion, there were no wounds. Both neurological and vascular examinations were normal.

Investigations and Procedure:

Initial X-ray radiograph of the pelvis: (Figure 1) showed displaced left neck of femur fracture with lytic bony lesions over the left and right proximal femur. Furthermore, the femur x-ray (Figure 2) demonstrated multiple bone lytic lesions at distal and proximal shaft of left femur bone. Routine laboratory tests displayed minor normocytic anemia (hemoglobin 11.3 g/L, mean corpuscular volume 79.9fL, mean corpuscular hemoglobin 28 pg), marked hypoproteinemia (albumin 25.2 g/L), and elevated serum alkaline phosphatase (ALP 1000 IU/L). The remaining parameters, including renal function, serum electrolyte levels, blood coagulation, urine and stool testing, were all within normal limits.

Admission and Hospital Course:

Patient was admitted under orthopedics for local and systemic staging. Metastatic carcinoma was one of the top differential diagnoses, assuming either lung, thyroid, renal or prostate metastasis. Bone scan (**Figure 3**) reported multiple focal intense tracer uptakes seen in the sternum, both femur, pelvis, skull, spine, ribs bilaterally, both clavicles and both humeri; thus indicated multiple bone metastasis. A review of computed tomography showed no lesions among the lung, thyroid, kidneys and prostate with multiple bone metastases, including pubic, rib and lumbar vertebrae metastases.

Given the likely diagnosis of bone metastasis, a long gamma nail was used for fixation of left femur fracture (**Figure 4**). The prognosis was not yet known and the primary lesion was still under investigation. After the operation, patient was stabilized post operatively but he started to develop a drop in hemoglobin with positive occult blood in stool. It was indicated to do an endoscopy (**Figure 5**) that revealed malignant appearing large mass located at cardia of stomach. Biopsy was performed and showed invasive poorly adenocarcinoma, with focal signet ring cells.

The case was discussed under the hospital tumor board who they advised to provide palliative care. The health condition of the patient had started to deteriorate and sadly, he died after one month of his admission due to progression of the disease that led to cardiopulmonary arrest. Therefore, a diagnosis was advanced gastric adenocarcinoma with metastases associated with bone fracture.

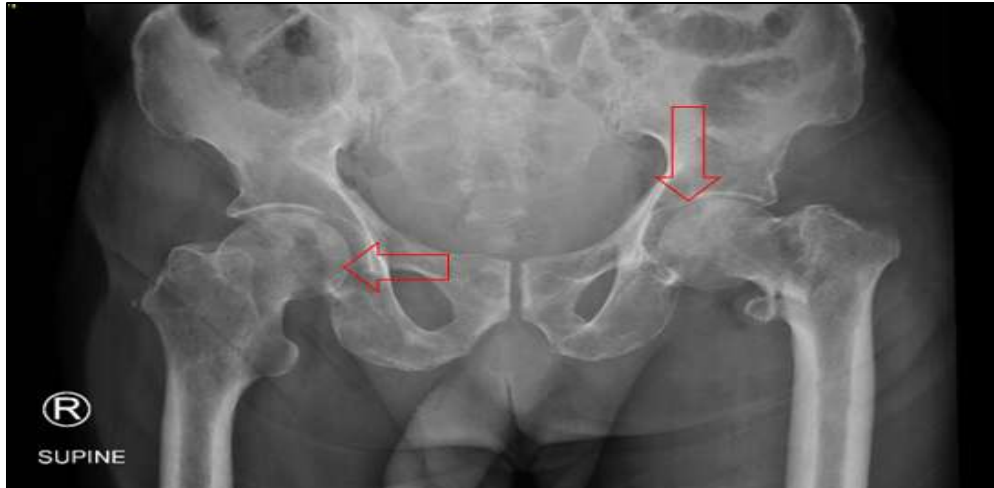


Figure 1:- X-ray radiograph of Pelvis showing displaced left neck of femur fracture with lytic bony lesions over the left and right proximal femur bone.



Figure 2:- X-ray showing multiple bone lesions at distal and shaft of left femur bone with closed fracture in left intertrochanteric femur.

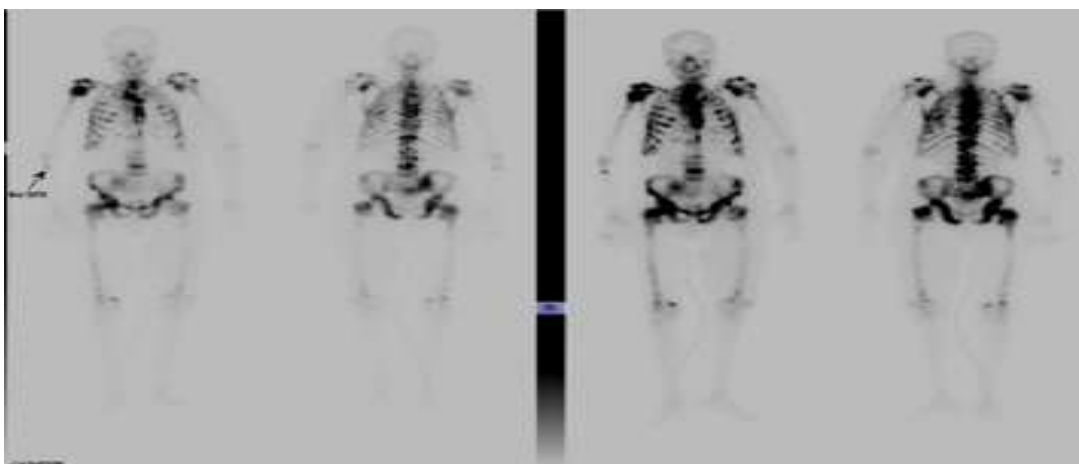


Figure 3:- Bone scintigraphy showed multiple abnormal uptake of radioactive material, particularly in the lumbar vertebrae.

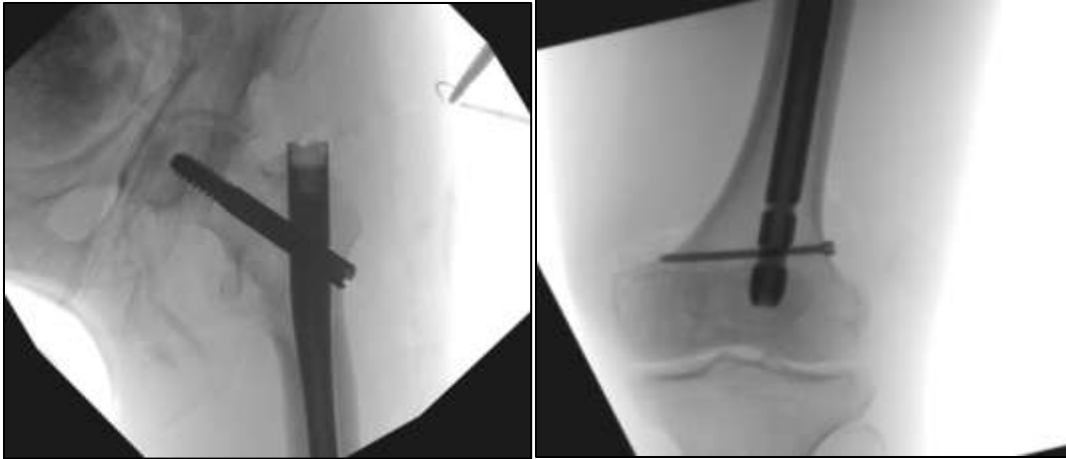


Figure 4:- X-ray showing post operation of fixation of left femur fracture long gamma nail.

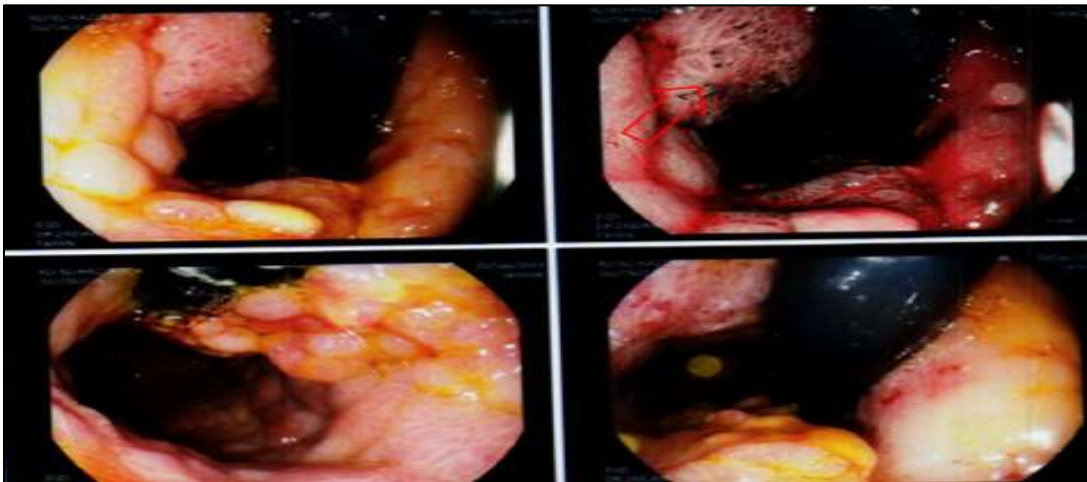


Figure 5:- Esophagogastroduodenoscopy findings of gastric mass at cardia of stomach.

Discussion:-

The reported incidence of bone metastases extends widely from as low as 1% in clinical practice to as high as 45% in screening studies (autopsy) for bone metastases, indicating that many cases are asymptomatic.^(15,16) Gastric cancer presenting as bone metastases without any gastrointestinal symptoms is rare and has been reported in the literature.⁽¹⁷⁾ Despite the lower observed prevalence of bone metastases among patients with gastric cancer but it has been portended a poor prognosis. The present case report describes asymptomatic with advanced and aggressive gastric cancer that caused the patient's death.

The exact mechanism of tumor cells spread to the bone is controversial. Lenhart et al⁽¹⁸⁾ justified the early spread of gastric cancer to the bone by the presence of many blood capillaries in gastric mucosa. This hypothesis with the existence of paravertebral venous plexus are explained why there is a higher incidence of bone metastasis occurs in the axial skeleton, such as the spine (66%), pelvic bones (43%) and the femur (30%)^(19,20). This is in line with the bone scan of the present case that showed abnormal uptake of radioactive material, particularly in the lumbar vertebrae and femur.

Concerning the clinical symptoms and complications of bone metastasis from Gastric cancers, patients may present with refractory pain or pathological fractures associated with laboratory abnormalities include elevated alkaline phosphatase (ALP), increased LDH, and anemia or thrombocytopenia.^(1,2) Early detection of bone metastases is difficult and there is no high valid test to discover it earlier. Bone Scan could detect bone metastasis before the plain X-ray but the hot uptake lesions in Bone Scan may be detected in many other lesions rather than bone metastasis.^(21,22,23) The present case had X-ray findings of left femur fracture associated with anemia, elevated serum

alkaline phosphatase and multiple abnormal uptake of radioactive material in Bone Scan. The primary tumor of stomach adenocarcinoma was confirmed by endoscopy.

In context of treatment, at the stage of metastatic setting, treatment aims at symptomatic relief to the patient to improve the quality of life and prolong symptom free survival. However, The prognosis of patients exhibiting bone metastases is worse and the gastric cancer patients with bone metastasis showed the shortest survival rate ranged between 5 months to 3 years and half, which is considered low in comparing with those with metastases in other sites, including the thorax, liver or other regions of the abdomen.^(13,14) The present case underwent to surgical treatment of left femur fracture fixation by a long gamma nail after that patient had deteriorated and passed away after one month of his hospital admission.

Conclusion:-

Most bone metastases are asymptomatic; however, most patients with metastatic bone disease will develop significant pain at some point in their disease course. Very rare for gastric cancer to be without gastrointestinal symptoms. In addition, many cases indicated the importance of suspicion gastric cancer in patients with an initial presentation of bone metastasis. The survival rate is short and treatment aims at symptomatic relief to the patient to improve the quality of life and prolong symptom free survival.

Ethical consideration:

The relatives of patient were informed that data from the case would be submitted for publication, and they gave their consent.

Conflicts of interest:

None.

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