

Squamous cell carcinoma of esophagus presenting as bone metastases in five cases

*Rezaee H. MD¹, Bradaran Rahimi M. MD²

^{1,2}Associated professor of radiology-University of Medical science of Mashad

Abstract

Introduction: Esophageal carcinoma rarely metastasizes to the bone. The objective of the current study was to report five cases of esophageal carcinoma which first presented with bone metastases.

Material and Methods: From January 1987 to June 2001, 550 patients with esophageal cancer were admitted to the Department Radiology of Ghaem Hospital for barium swallow, CT scan, sonography and plain radiographs. In five patients (three men, two women) first symptoms were bone pain and swelling due to metastasis. Radiographs and CT scan of specific bones were taken for diagnosis. Biopsy confirmed the diagnosis of squamous cell carcinoma metastases to bone. The primary site of malignancy was unknown at the time of presentation. Further evaluation including barium swallow, proved squamous cell carcinoma of esophagus that metastasized to the bones.

Results: Five patients with esophageal carcinoma (age range, 24–60 years; mean age, 45 years) Two patients showed solitary metastasis, and three patients had multiple metastases. Pelvis, cervical vertebrae, ribs, tibia and femur were involved. Patterns of bony destruction were lytic and in one patient was mixed (osteolytic-osteosclerotic). Two patients had cortical metastases simulating a primary bone tumor. The mean interval between skeletal metastasis and the appearance of dysphagia was two months.

Conclusion: Bone metastases are very uncommon at initial presentation in patients with esophageal carcinoma, but Patterns of bony destruction in esophageal carcinoma were predominately lytic and rarely sclerotic.

Key words: Esophageal cancer, Bone metastasis, Cortical metastasis

Introduction

Difficulty in swelling is the most typical and also the earliest symptom of esophageal carcinoma. The other clinical features are retrosternal pain on swallowing, regurgitation of swallowed food, dysphonia, weight loss and anorexia (1). An extremely unusual condition is bone pain or swelling due to bone metastasis without complaints of localized esophageal symptoms.

To our knowledge only one report has been published in English literature with such complaints (2).

Five cases here reported are unique because first symptoms were bone pain and swelling due to metastases of esophageal carcinoma. Also we reported the radiological features of bone metastasis of esophageal carcinoma.

Material and Methods

From January 1987 to June 2001, 550 patients with esophageal cancer were admitted to the Department of Radiology of Ghaem Hospital

*Address: Department of Radiology of Ghaem Hospital, Ahmadabad Street, Mashad, Iran
Email: H-rezaee@mums.ac.ir
Acceptation date: 84/12/18 Confirmation date: 85/9/3

for barium swallow, CT scan, sonography and plain radiographs. Detailed records including clinical symptoms from each patient were taken for another report. Medical records were reviewed for presenting first symptoms and clinical course, including findings at histopathologic examination.

In five cases first symptoms were bone pain and soft tissue swelling due to metastases. Workup in these patients for primary site of tumor including barium esophagograms were done. Two patients were hospitalized in the orthopedic department for prominent soft tissue mass associated with cortical destruction in femur and tibia, favoring a diagnosis of primary malignant lesion of bone. Open biopsy revealed a metastatic squamous cell carcinoma invading the cortical bone. The time interval from diagnosis of bone metastases to the appearance of dysphagia was two months. All patients finally underwent endoscopy with biopsy proved squamous cell carcinoma of the esophagus (well differentiated, 2; moderately differentiated, 2; and poorly differentiated, 1). Two patients showed solitary metastasis, and three patients had multiple metastases. Pelvis, cervical vertebrae, ribs, tibia and femur were involved. Patterns of bony destruction were lytic, and in one patient was mixed osteolytic-osteosclerotic.

case 1: A 60-year-old woman without addiction with two month history of pain in the left thigh and inguinal region referred to our hospital.

A general physical examination at the time of presentation revealed no significant abnormalities except swelling and pain of the left thigh. Roentgenograms and computed tomography of the left femur showed an osteolytic lesion arising in the diaphysis of the femur with extensive cortical disruption, suggesting a cortical metastases and possibly a primary bone tumor (Fig. 1).



Fig.1- Case 1: Axial CT scan demonstrate a cortical metastasis of the left femur with extra osseous extension

A biopsy was performed, that showed squamous cell carcinoma, metastasized to the bone (Fig. 2). After operation, the search for the primary site of SCC revealed negative gynecological examination, chest x-ray and sonography of the abdomen and pelvis.

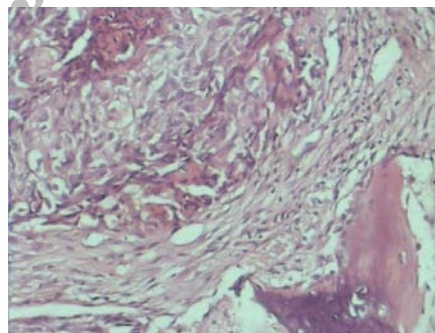


Fig. 2-case 1; Microscopic appearance of the open biopsy of the left femur shows well differentiated squamous cell carcinoma. Note the island of the osseous tissue.

Further questioning revealed that the patient had recently experienced a mild degree of dysphagia and odynophagia that she had thought was due to the operation of her thigh, and not worth mentioning.

Barium esophagogram obtained showed a 5-cm segment of an esophageal mass with luminal narrowing and ulceration at the lower third of esophagus (Fig. 3).



Fig. 3- Cas1: Esophagograms Show stricture with mucosal destruction, irregular intraluminal filling defects and "shouldering" sign

An endoscopic examination revealed a tumor 28cm from the incisors. This was biopsied and showed differentiated squamous cell carcinoma of the esophagus (Fig. 4).

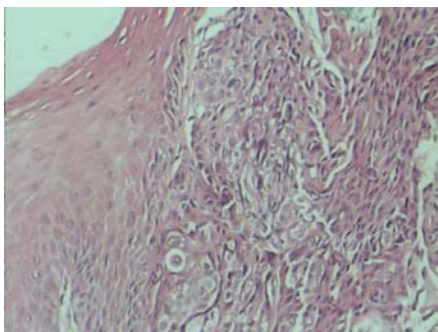


Fig. 4 -Case 1, Photomicrograph of the biopsy specimen of the esophagus reveals a well-differentiated squamous cell carcinoma.

Case 2: A 42-year-old female presented to her primary-care physician complaining of a 2-month history of a painful and swollen left leg. Radiographs showed a lytic lesion of the mid portion of the left tibia simulated a primary bone tumor (Fig. 5).

Open biopsy revealed squamous-cell carcinoma metastasizing to the bone. Meanwhile she developed neck pain and difficulty swallowing solid foods. For further evaluation she was hospitalized and referred to our department for skeletal survey and GI

tract studies. Roentgenograms of the cervical vertebrae showed mild collapse in six vertebrae, and esophagogram showed a 7-cm segment of an esophageal irregularity, with luminal narrowing and mucosal destruction of the lower third of esophagus (Fig. 6). Endoscopy and biopsy confirmed SCC of esophagus with moderate differentiation.

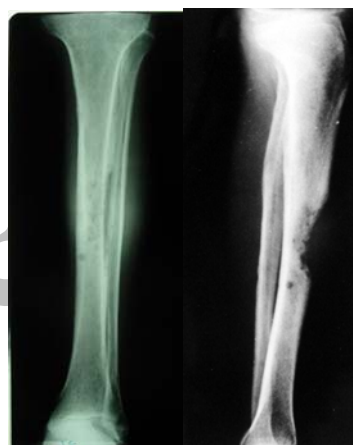


Fig 5-Case 2: The radiograph shows an osteolytic lesion arising in the diaphysis of the left tibia with extensive cortical disruption



Fig. 6-Case 2: Esophagogram shows irregular, nodular, and polypoidal intraluminal filling defects.

Case 3: A 24-year-old male Afghan worker with six month history, of left leg pain referred to our department for skeletal survey for bone metastases and search for the primary site of squamous cell carcinoma that metastasizes to iliac bone. He could not walk without stick and recently had difficulty in swallowing solid foods, which contributed to a 5-kilogram weight loss. Skeletal radiographs revealed only a large lytic metastasis to the left iliac bone (Fig 7).



Fig. 7- Case 3: Anteroposterior roentgenogram of the pelvis, illustrating a large ill-defined destructive lesion in the left ilium

Chest x-ray and sonography of the liver were unremarkable. Esophagogram showed a 6-cm segment of an esophageal mass with luminal narrowing and mucosal irregularity and ulceration at the third portion of esophagus that confirmed in endoscopy and biopsy as poorly squamous cell carcinoma of esophagus that metastasize to the iliac bone.

Case 4: A 60-year-old woman with a 30-year history of addiction to opiate and cigarette smoking referred to the outpatient clinic of Ghaem Hospital. She had three-months history of pain of the right shoulder and right hand. Radiographs of the cervical showed collapse of the seventh cervical vertebra highly suggestive of bone metastases (fig. 8).



Fig. 8: Case 4; Lateral roentgenogram of the cervical spine illustrating destruction and compression fracture of the seventh cervical vertebra.

Physical examination revealed adenopathy in the right side of the neck, and biopsy showed squamous cell carcinoma metastases to the lymph nodes. Workup for the primary site, including barium esophagogram showed a 4-cm segment of an esophageal mass with luminal narrowing and mucosal irregularity at the level of the aortic arch. Endoscopies and biopsy confirmed esophageal carcinoma.

Case 5: A 40-year-old male farmer, without addiction referred for radiographs of the chest and CT scan. He had painless swelling in the right side of the chest for one month and had developed dysphagia recently. Radiological evaluation revealed carcinoma of the lower third esophagus metastasized to the right sixth and seventh ribs as a lytic-sclerotic lesion with expansion and extension to the soft tissues (Fig. 9). Endoscopy and biopsy showed SSC of esophagus with bone metastases.

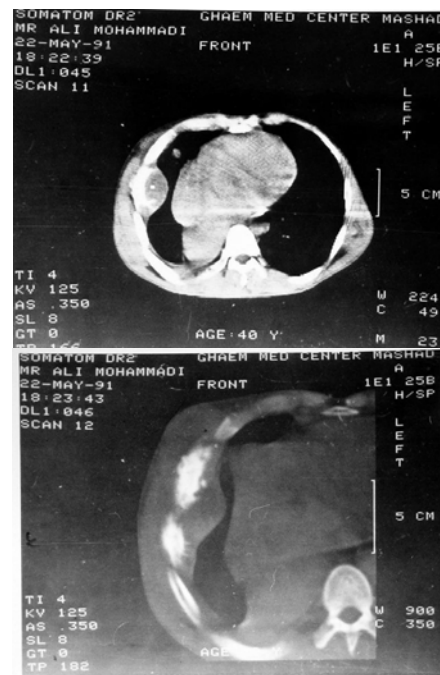


Fig. 9(a, b)-Case 5: Axial CT scan demonstrate lytic- sclerotic metastasis of the ribs and associated soft-tissue mass.

Discussion

The present cases exhibit two unusual features of esophageal carcinoma: delayed dysphagia and bone metastasis. Distant metastases of esophageal carcinoma has been reported in up to 85% patients who had undergone autopsies by some authors, with a high frequency in the lymph nodes, lung and liver (3). Metastases to bone have been considered uncommon. This has been reported to vary from 1% to 14% in autopsy series (4,5). In clinical practice, bone metastases of esophagus cancer occurred infrequently. Quint et al examined, 838 newly diagnosed of esophageal carcinoma cases by CT scan, plain radiographs and bone scan and showed 18% had metastases of which only 1.6% involved bone (6).

Recently, FDG-PET imaging technique has improved the ability to recognize distant metastasis of esophageal carcinoma (7). And detection of bone marrow micrometastasis by immunomagnetic separation shows positive cancer cells in up to 25% of patients with esophageal carcinoma (8, 9). In English literature the diagnosis of bone metastases of esophageal carcinoma was established definitively by roentgenography were infrequent (2, 3, 10).

An extremely unusual condition were initially seen a patient with esophageal carcinoma with bone pain due to metastases without complain of dysphagia or other common features of esophageal carcinoma. A review of the literature of the last 25 years revealed only one case with these features (2). Roentgenological findings of esophageal cancer metastases in bones do not differ from the manifestations of osteolytic and sclerotic metastases in bones of malignant tumors of other localizations, (3, 11, 12). The spine is the most common site for bone metastases in esophageal carcinoma as other malignancies and may involved as locally spread. In two patients the cervical vertebra were involved, but carcinoma were involved the lower third of the esophagus, suggesting haematogenous spread

to the spine. In two patients (Cases 1, 2) first symptoms were bone pain due to an osteolytic lesion arising in the cortex of the femur and tibia (Fig 1,5) with accompanying soft-tissue mass, raised the possibility of a primary bone tumor. The case reported by Shewchuk et al also reveal a cortical metastasis (2). Cortical metastases have been reported in the literature first described in bronchogenic carcinoma (13) and suggested a specific feature of bronchogenic carcinoma. After that, Coerkamp and Kroon (14) reported 26 patients with solitary cortical bone metastases from nine different types of primary malignant conditions, including six cases of GI tract. Cortical metastases probably develop from tumor emboli caught in nutrient artery branches (11).

References

- 1- Puhakka HJ, Arrsalo K. Esophageal carcinoma: Endoscopic and clinical findings in 258 patients. *J of Laryn and Otol* 1988, 102:1137-1141.
- 2- Shewchuk SM, Meneses BO, Lerma LB, Shnider BI. Femoral and skull metastasis with hypercalcemia: occurrence with esophageal carcinoma without dysphagia. *Arch Intern Med.* 1982 142: 2207-9.
- 3- Bhushan B, Watal G, Ahmed A, Sanyal B, Pathania AG Bone metastasis from carcinoma of the oesophagus *Austral Radiol* 1987 31:414-7.
- 4- Moses FM. Squamous cell carcinoma of the esophagus, Natural history, Incidence, Etiology, and Complications. *Gastroenterology Clin of North America* 1991 20: 703-716.
- 5- Anderson LL, Lad TE. Autopsy findings in squamous-cell Carcinoma of the esophagus. *Cancer* 1982, 50:1587-1590.
- 6- Quint LE, Hepburn LM, Francis IR, Whyte RI, Orringer MB. Incidence and distribution of distant metastases from newly diagnosed esophageal carcinoma. *Cancer* 1995, 76: 1120-5.

- 7- Nakamoto Y, Osman M, Wahl RL. Prevalence and patterns of bone metastases detected with positron emission tomography using F-18 FDG. Clin Nuc Med. 2003 28: 302-7.
- 8- Nakamura T, Matsunami K, Hayashi K, Ota M, Ide H, Takasaki K. Detection of bone marrow micrometastasis in esophageal cancer patients by immunomagnetic separation. Oncol Rep. 2004 11:999-1003.
- 9- Natsugoe S, Nakashima S, Nakajo A et al Bone marrow micrometastasis detected by RT-PCR in esophageal squamous cell carcinoma. Oncol Rep 2003 10: 1879-83.
- 10- Ashby ME, Dappen N. Esophageal carcinoma metastatic to the patella. A case report. JAMA 1976 235: 2519-20.
- 11- Resnick D, Niwayama G. Diagnosis of Bone and joints disorders 1988. Second ed. Saunders Company, Philadelphia, London, Vol 6 3979- 80.
- 12- Stoll BA, Parbhoo S. Bone Metastasis, Monitoring and treatment, (1983) 1 ed, Raven Press New York 2-17.
- 13- Deutsch A, Resnick D. Eccentric cortical metastases to skeleton from bronchogenic carcinoma. Radiology 1980; 137: 49-52.
- 14- Coerkamp EG, Kroon HM. Cortical bone metastases. Radiology 1988; 169: 525-528.

خلاصه

معرفی ۵ مورد کارسینوم سلول سنگفرشی مری با تظاهر اولیه متاستاز استخوانی

دکتر دلویی، دکتر محمود برادران رحیمی

مقدمه: کارسینوم مری به ندرت به استخوان متاستاز می دهد. در این مطالعه ۵ بیمار با تشخیص کانسر مری که اولین بار با متاستاز استخوانی تظاهر کردند معرفی می شوند.

روش کار: از سال ۱۹۸۷-۵۵۰، ۲۰۰۱ بیمار با کانسر مری به رادیولوژی بیمارستان قائم (عج) جهت انجام گرافی بلع بارم، سی تی اسکن، سونوگرافی و رادیولوژی عادی مراجعه کردند. در ۵ بیمار (۳ مرد و ۲ زن) اولین شکایات بیماری، درد استخوان و تورم محل به دنبال متاستاز بود. رادیوگرافی ها و سی تی اسکن استخوانی های خاص جهت تشخیص گرفته شد و جهت تایید تشخیص بیوپسی از استخوان انجام شد. در این بیماران مکان اولیه کانسر در زمان مراجعه ناشناخته بود. بررسی های بیشتر، شامل گرافی بلع باریم تشخیص بیماری را قطعی ساخته است.

نتایج: از ۵ بیمار با تشخیص کارسینوم مری (سن ۶۰-۲۴ سال و متوسط سنی ۴۵) سال متاستاز استخوانی در دو مورد متاستاز واحد استخوانی و ۳ مورد موارد متعدد متاستاز استخوانی وجود داشت. استخوان های دیگر شامل استخوان های لگن ستون فقرات گردنی ها دنده ها، تیبا و خمور بود. پاترن تخریب استخوانی به صورت لیتیک و میکس (استئواسکلروتیک، استئولیتیک) بود. در ۲ بیمار متاستازهای کورتیکال که تقلید کننده تومور اولیه استخوانی بودند دیده شد که متوسط زمانی بروز دیسفاژی متاستاز اسکلتی، دو ماه بود.

نتیجه گیری: متاستاز استخوانی به عنوان اولین تظاهر کانسرمری بسیار نادر می باشد. ولی تشخیص آن از جهت انتخاب روش درمانی بسیار ضروری است پاترن درگیری استخوانی عمدتاً به صورت لیتیک و در موارد نادری اسکلروتیک می باشد.

واژه های کلیدی: متاستاز کورتیکال، متاستاز استخوانی، کانسرمری