Clinical Case Report

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# A pathological toe fracture as the first presentation of cervical cancer

## A case report

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**Abstract**

**Rationale:** Cervical cancer is one of the most common gynecologic malignancies worldwide, and it spreads mainly through direct extension. Distinct metastases are less common and usually spread to distant lymph nodes, lungs, and bones. Bone metastases from cervical cancer are most commonly observed in the pelvis and spine. Thus, a pathological toe fracture as the initial presentation of cervical cancer is extremely rare.

**Patient concerns:** We report a patient with a toe metastasis that first presented with pain caused by a pathological fracture.

**Diagnoses:** The patient underwent surgery to remove the right great toe, and the histopathology revealed squamous carcinoma that originated from the cervix.

**Interventions:** The patient then underwent cervical cancer surgery, chemotherapy, and radiotherapy.

**Lessons:** A pathological toe fracture as the initial presentation of cervical cancer is extremely rare, but clinicians need to be aware that we should not exclude cancer when patients come to the hospital for pathological fractures.

**Abbreviation:** CT = computed tomography.

**Keywords:** bone metastases, cervical cancer, pathological fracture, toe metastasis

## 1. Introduction

Recently, the incidence of cervical cancer in China has ranked second in the world, and the average age of patients is 3 years younger than it was 10 years ago.[1] Distant metastases are uncommon in cervical cancer; however, when it occurs, it is usually observed in distant lymph nodes, lungs, and bones.[2,3] Cervical cancer bone metastasis indicates a poor prognosis.[4] Although bone is considered the third most common metastatic location after the lungs and liver, it is rarely observed in clinical practice.[5,6] Bone metastases are commonly observed at the spine and pelvis, whereas distal skeletal metastases are rare.[7–9] To our knowledge, pathological toe fracture as the first presentation of cervical cancer has never been reported. We report a patient with cervical cancer toe metastasis that first presented with pain caused by a pathological fracture.

## 2. Case report

A 36-year-old woman was admitted to our hospital due to progressive pain in the right great toe after a mild trauma. The patient initially received anti-infective treatment, which was not effective. Then, the patient underwent an X-ray examination, which revealed a pathological right great toe fracture (Fig. 1A). The computed tomography (CT) scan revealed local bone destruction at the distal joint of the right great toe (Fig. 2), with soft tissue swelling, which was considered a bone metastasis. To evaluate the patient's total bone condition, she underwent bone scintigraphy, which showed a right ischium metastasis. The patient claimed menstrual irregularities and denied any other abnormal symptoms. The patient eventually underwent surgery to remove her right great toe and bone cementplasty was performed in the right ischium. The postoperative pathological examination revealed squamous carcinoma that originated from the cervix (Fig. 1B). Squamous-cell carcinoma and blood vessel invasion were found in subcutaneous tissue and osseous tissue. The immunohistochemistry confirmed that p63 was positive in the cell nucleus and p16 was strongly positive in both cell nucleus and cytoplasm, which were consistent with primary cervical metastatic squamous cell carcinoma. Subsequently, the patient underwent a cervical cancer surgery, chemotherapy, and radiotherapy to treat the cervical cancer (Fig. 1C). According to postoperative pathology, the patient received three cycles of TP (paclitaxel liposome 135 mg/m2 d1, oxaliplatin 90 mg/m2 d1), external beam irradiation and twice brachytherapy (vaginal dual

*Editor: N/A.*

*All authors have read and approved the content, and agree to submit it for consideration for publication in your journal. They promise that their manuscript is a unique submission and is not being considered for publication by any other source in any medium. Further, the manuscript has not been published.*

*There were no external funding sources for this study.*

*There are no ethical/legal conflicts involved in the article.*

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*Medicine (2019) 98:3(e14190)*

*Received: 28 August 2018 / Received in final form: 22 December 2018 / Accepted: 26 December 2018*

*http://dx.doi.org/10.1097/MD.0000000000014190*

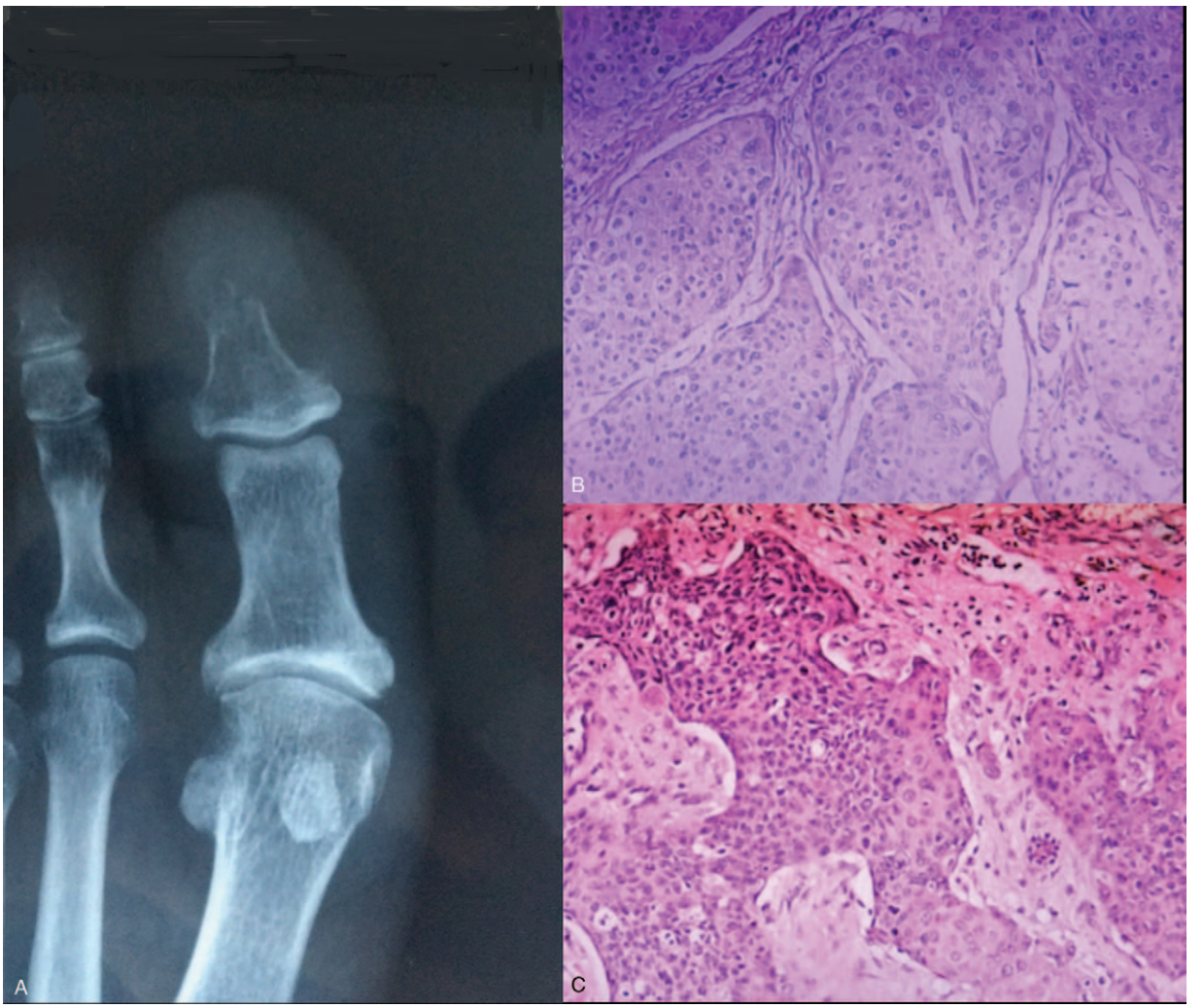


**Figure 1.** (A) X-ray examination, showing a pathological fracture of the right first toe. (B) Pathological findings of the toe following amputation showing squamous cell carcinoma. (C) Pathological findings showing squamous carcinoma of the cervix.

source: 5 mm under the vaginal mucosa: 700cGy). The patient's FIGO stage was diagnosed with IVB. At her 6-month follow-up, she was alive with disease.

This study complied with the *Declaration of Helsinki* and was approved by the Human Ethics and Research Ethics Committees of the Fourth Hospital of Hebei Medical University. The participating patient provided written informed consent.

## 3. Discussion

The primary tumor or metastasis of cervical cancer can spread directly. The tumor can spread to the pelvis and spine through the Batson venous plexus. Distant bone metastases may be related to the peripheral blood circulation of tumor cells.[6] The process of bone metastasis involves multiple mechanisms; thus, multiple bone metastases are commonly observed in the clinic.[10] Recently, Japanese scholars found that the morbidity of cervical cancers with bone metastases ranged from 1.1% to 16% owing to different test methods.[7]

When patients are diagnosed with bone metastases from cervical cancer, >60% die within 2 years,[6] and the median survival time is reported to range from 7 to 12 months.[5] Once the patient with bone metastasis experiences recurrent bone metastases, the median overall survival significantly shortens.[7] Although a minority of patients survive for >10 years, the clinical progression of disease does not benefit from it.[6] The main therapeutic goal for patients with cervical cancer with bone metastasis is to improve their quality of life. It has been reported that >60% of patients benefit from chemotherapy.[6,11,12] The lesion sites that receive high-dose radiation therapy can receive radiotherapy again, since the overall survival is short.[6] At present, the clinical treatment of cervical cancer with bone metastasis is comprehensive treatment, which includes surgery, radiotherapy, chemotherapy, and bisphosphonate drugs.[5,13] When extraskeletal metastases appear at the same time, patients predominantly accept palliative treatment.[7] It needs to be clarified that we took palliative treatment for patients and the clinical progression of disease does not benefit from only surgery. The overall survival of patients who receive bisphosphonates, chemotherapy, and radiotherapy is significantly longer than those who accept bisphosphonates only.[7,12] And the clinical progression of disease does not benefit from the surgery

Thanapprapasar et al considered prognosis to be related to the position of the bone metastasis, and they found that patients in whom the cancer only spreads to the pelvis had a longer overall


**Figure 2.** Images of cervical cancer toe metastasis in Case. (A) Dorsum of the right first toe, showing swelling due to mild trauma. (B) Top view of the right first toe. (C) Lateral view of the same toe.

survival.[5] However, Hiroshi Makino et al did not find a clear connection between the sites of bone metastatic lesions and lifespans in their retrospective study, and they thought that the number and size of bone metastases had no relation to prognoses.[7] Hiroko Matsumiya et al established a survival prediction model for patients with bone metastasis from uterine cervical cancer.[7] In this model, their analysis showed that extraskeletal metastasis, performance statuses of 3–4, previous radiation or chemotherapy, multiple bone metastases, and a bone metastasis-free interval of <12 months were significantly and independently related to poor prognosis. A prognostic score could be calculated by adding up the number of significant factors; and therefore, every patient was scored from 0 to 5. The length of survival could be evaluated by this score, and the lower the score, the shorter the survival.[8]

It is important to diagnose cervical cancer with bone metastasis early through X-ray examinations and isotope bone scans.[14] The latter can detect lesions earlier than the former, by at least one month. However, isotope bone scans may provide false positive results, and to improve the relevance ratio, various imaging examinations are recommended.

Most patients with bone metastases from cervical cancer are first diagnosed with the cancer. Here, the pathological fracture was the first presentation, and the cervical cancer was diagnosed by a postoperative pathological examination. Clinicians need to be aware that we should not exclude cancer when patients come to the hospital for pathological fractures.

## Author contributions

All authors have read and approved the final manuscript.
**Conceptualization:** Jinming Zhang.
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