

## Case Report

# Uncharted Pathways: A Rare Case of Bony and Soft Tissue Metastasis from Cervical Carcinoma

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**Submitted:** 01 December 2023

**Accepted:** 27 December 2023

**Published:** 29 December 2023

**ISSN:** 2334-2307

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**Abstract**

**Background:** The most frequent tumors of the spine are metastases. However, we present a particular case characterized by an atypical primary origin resulting in secondary lesions in both the spinal column and adjacent soft tissues - specifically, squamous cell carcinoma of the cervix.

**Methods:** We described a case of a female patient diagnosed with infiltrating Grade 3 squamous cell carcinoma of the cervix in November 2020 underwent a series of treatments, including neoadjuvant radiochemotherapy and then surgery. The patient was monitored until the identification of a bone lesion in the right 10th rib in November 2021, prompting targeted stereotactic radiotherapy. Subsequent evaluations revealed evolving lesions in the thoracic spine and adjacent soft tissues.

**Results:** Despite various investigative procedures and treatments, including chemotherapy and surgical interventions, the patient's condition deteriorated, with the appearance of extensive metastases in unconventional sites, leading to a challenging diagnostic and therapeutic management pathway.

**Conclusion:** This case exhibits an aberrant metastatic pattern rarely documented in literature, necessitating a comprehensive understanding of such occurrences for enhanced clinical approaches and improved outcomes in similar pathologies.

**INTRODUCTION**

Bone one of the most common sites of metastasis, following liver and lungs. Among skeletal metastases, the spine stands out as the most prevalent site, representing approximately two-thirds of all bone tumors. These tumors are primarily located in the thoracic and lumbar regions. Spinal metastases occur in about 10% of carcinoma patients during the course of their illness, making cancer dissemination to bone tissue the most common malignant bone condition. The most frequently observed bone metastases arise from breast carcinoma, prostate carcinoma, lung carcinoma, thyroid carcinoma, malignant melanoma (black skin carcinoma), renal carcinoma, and multiple myeloma. A comprehensive autopsy reveals bone metastases in 70% of individuals succumbing to cancer.

In most cases, spinal pain emerges as the initial indication of bone involvement. Subsequently, motor and autonomic limitations rank as the second most prevalent symptoms (observed in 85% of patients). These symptoms are accompanied by extremity numbness, gait disturbances (manifesting as leg

weakness), reduced appetite, and rapid fatigue. Additionally, they often lead to bladder emptying issues, increased urination frequency, or the inability to control urine, alongside fecal incontinence [1].

Therefore, the differential diagnosis with other conditions is challenging.

This case study delineates a rare occurrence of secondary involvement in the thoracic spine and surrounding soft tissues in a patient with a history of squamous cell carcinoma of the cervix - a highly uncommon primary cause for this type of tumor, with scant similar cases documented in the existing literature.

**CASE PRESENTATION**

The patient is a woman diagnosed at the age of 49-years-old with infiltrating Grade 3 squamous cell carcinoma of the cervix in November 2020. Between November 2020 and February 2021, she underwent radiochemotherapy with 3 cycles of cisplatin, interrupted due to the onset of anemia. Subsequently, she underwent surgical treatment in April 2021,

including hysterectomy, bilateral salpingo-oophorectomy, and pelvic lymphadenectomy of levels I and II, with intraoperative cytological and histological sample collection. The collected samples documented surgical margins and parameters free from atypia, negative peritoneal lavage cytology for atypia, as well as lymph node samples free from metastasis. The patient was then followed up clinically and radiologically until the detection of a bone lesion at the right 10th rib level in a chest CT scan in November 2021, indicating a likely disease location. Consequently, she was recommended for stereotactic radiotherapy of the bone lesion, administered between December 2021 and January 2022. A follow-up in March 2022 documented a dimensional reduction in the lesion at the right 10th rib level but simultaneously revealed a lytic appearance at the pedicle, transverse process, and right hemi-body of D10 and a lytic alteration of the transverse process and pedicle of the right D9 and posterior arch of the 9th rib. Investigations in April 2022, including CT-guided biopsy and subsequent orthopedic outpatient evaluation, confirmed the presence of epithelial neoplastic fragments, indicative of carcinoma metastasis. The case was discussed in a multidisciplinary meeting, and considering the patient's clinical history, targeted radiotherapy was recommended for the new bone lesion, following a full spinal MRI with contrast and simultaneous initiation of chemotherapy in a DH regimen. The full spinal MRI revealed fluid-like collections in the subcutaneous adipose tissue in the mid-posteromedial bilateral region extending from D8 to D11, more prominent on the right side, as well as a similar collection in the deep soft tissues in the right lateral paravertebral region extending from D9 to D10 (Figure 1). The patient received the first 5 cycles of Carboplatin + Taxol and underwent a new full spinal CT in November 2022 (Figure 2), which confirmed disease stability but revealed a rounded fluid-like collection measuring 17x13mm in the subcutaneous adipose tissue at the D11 level.

Subsequently, two additional cycles of Carboplatin + Taxol were administered, but a subsequent MRI showed an increase in the dimensions of the previous collections. Following a vertebral reevaluation, percutaneous stabilization of the affected vertebral segment was indicated. The patient presented to the Emergency Department in May 2023 due to intense refractory pain at the diseased dorsal tract. She was subsequently admitted to the Spinal Surgery Department for percutaneous arthrodesis at D7-D8 and D11-D12 and an open procedure at D11 on the right side for microbiological and cytological sample collection. During the surgery, the known left dorsal paravertebral neoformation was also removed and sent for histological analysis. In the following days, the patient was discharged home with a stable clinical condition and significant improvement in pain symptoms. However, she returned to the Emergency Department about 10 days later reporting abundant clear, colorless secretions, particularly when the wound was pressed. She was readmitted due to suspected cerebrospinal fluid fistula, based on secretion characteristics at MRI images (Figure 3), although the patient did not exhibit typical symptoms. Due to this atypical presentation



Figure 1 T2-w MRI showing



Figure 2 CT scan

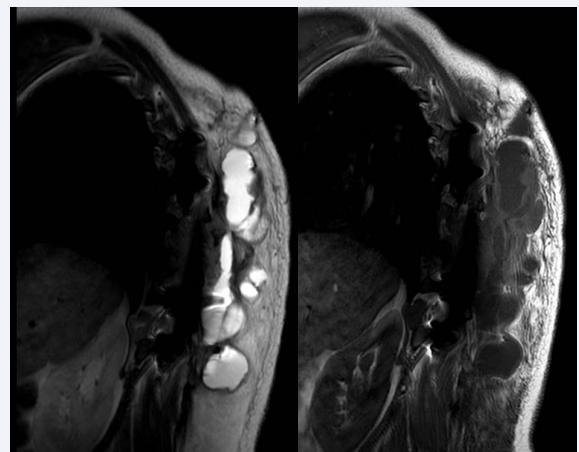


Figure 3 T2-w and T1-w MRI

and the presence of low-grade fever, the possibility of an infectious complication was considered. An infectious assessment was requested, recommending intraoperative microbiological sample collection during a wound revision surgery. Throughout the hospitalization days, wound swabs, blood cultures, urine cultures, and percutaneous samples of dense, particulate-looking liquid were repeatedly taken, all yielding negative results for both cerebrospinal fluid and infectious material. Consequently, a surgical revision of the wound was performed, during which mucinous/collagenous material infiltrating the subcutaneous and subfascial planes was identified and removed for histological examination. Two purulent collections were also obtained for microbiological analysis, but no cerebrospinal fluid leakage was observed. Empirical antibiotic therapy was initiated based on infectious recommendations but was later discontinued due to negative microbiological findings. However, the presence of squamous carcinoma infiltrations, likely metastatic from the cervix, was documented in the muscle fascia biopsies, mucinous/collagenous material, and the fistulous tract's skin responsible for secretions. Considering these findings, a total body CT scan (Figure 4) was performed, revealing disease progression with increased pathological tissue dimensions in the dorso-lumbar paraspinal tissues and secondary lesions at the tail of the pancreas and the right lateral bladder wall, along with ascitic and pleural effusions. The case was evaluated by gynecologist colleagues who recommended the patient's transfer to a hospice, which occurred in July 2023. About a month after discharge, direct contact with the patient's family revealed her demise.

## DISCUSSION

Considering that cervical tumors very rarely metastasize to the spine, this is a peculiarity of the case described. Disibio G et al., described in a 2008 study as potential sites of metastasis in order of frequency: vagina, locoregional lymph nodes, distant lymph nodes, liver, lung, bone, and stomach [2]. However, in our case, there were no metastases in the usual sites, but rather osseous metastases in the thoracic vertebral levels and notably in the subcutaneous and paravertebral muscle tissues, the later being a site reported infrequently in literature. We found only

a few other cases mentioned in literature describing similar metastasis of cervical carcinoma. Orellana T et al. described a case of metastasis in the skeletal muscle of the right upper extremity and the adipose tissue of the right gluteus [3]. In another study spanning over 30 years, Plaza et al. identified 118 cases of soft tissue metastases, with only two cases (located in the gluteus and thigh), involving squamous cell carcinoma of the cervix [4]. Miyoshi Ai et al., described a case of cervical carcinoma metastasis to the latissimus dorsi muscle, surgically treated, with subsequent recurrence of metastasis in the D7 vertebral body invading the vertebral canal [5]. Some authors reporting these types of localizations also acknowledge the exceptional nature of such metastasis, hindering a clear management approach for these cases [3,5,6].

Initially, the patient's gynecologists did not recognize these lesions as secondary to the known disease, given the rarity of the occurrence. During the second admission, efforts were made to exclude an infectious etiology or a postoperative complication, such as a cerebrospinal fluid fistula, before considering a tumoral etiology.

Apparently, the possibility that the soft tissue localizations might stem from local neoplasm dissemination post-biopsy procedures rather than hematogenous spread cannot be overlooked, despite strict compliance with all surgical gestures [7,8].

We believe this case warrants attention due to its complexity - it does not solely entail vertebral metastasis but rather an extensive engagement of the surrounding soft tissues. While spinal metastases are relatively frequent, the distinct manifestation in the soft tissues neighboring the spine, as observed in this instance, presents diagnostic and management complexities. Similar cases documented in the literature emphasize the rarity of these occurrences, highlighting the intricate nature of establishing standardized protocols for diagnosing, treating, and preventing potential complications in such scenarios.

Understanding the atypical metastatic pathways of cervical carcinoma, particularly those affecting the spine and surrounding musculature, remains pivotal for refining diagnostic strategies and optimizing tailored treatment plans.

## CONCLUSIONS

Unusual metastatic patterns, particularly in orthopedic regions, pose diagnostic challenges and demand nuanced management approaches. Literature reports, albeit scarce, have hinted at skeletal muscle and soft tissue involvement in cervical cancer metastases, emphasizing the significance of orthopedic evaluations in such cases. Our report highlights the diagnostic dilemma posed by atypical metastatic pathways, urging clinicians to consider orthopedic manifestations in cervical cancer metastases. Future research and collective experiences could illuminate these unconventional metastatic trajectories, refining treatment strategies for better orthopedic management in metastatic cervical carcinoma.



Figure 4 CT scan axial

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