



## MULTIPLE SPINAL METASTASIS OF COLORECTAL ADENOCARCINOMA; CASE REPORT AND LITERATURE REVIEW

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### ABSTRACT

Gastrointestinal adenocarcinomas are very aggressive tumors. In the later stages of the disease, widespread metastases may occur. Bone metastases of colorectal cancers are usually osteolytic lesions. Multiple spinal metastases are very rare at the stage of diagnosis. We present a case of colorectal adenocarcinoma with multiple spinal metastasis which was operated due to C7 cervical pathological compression fracture and accompanied by literature review.

**Keywords:** Colorectal adenocarcinoma, cervical spine, metastasis, surgery

**Level of Evidence:** Case report, Level IV.

### INTRODUCTION

Metastases constitute the majority of spinal cancers<sup>(22)</sup>. Spinal vertebrae metastasis, cysts, pathological fracture could make spinal cord compression, persistent pain, sensory deficit, and / or paralysis<sup>(2,26-27)</sup>. Operations in these patients are palliative and are usually done for symptomatic relief<sup>(1,18,24)</sup>. Gastrointestinal metastatic spinal lesions are aggressive tumors and mean survival after diagnosis is 2.6 months<sup>(18)</sup>. Colorectal cancer metastasis are regional lymph nodes, liver, lung, and the peritoneum<sup>(7,11,14,15,19,21)</sup>. Bone metastases of colorectal cancers are rare especially multiple ones and usually shows osteolytic form. Spinal metastases frequency; lumbar 36 % to 75 % and thoracic spine 17 % to 61 %, followed by sacral 6 % to 35 % and cervical vertebrae 2 % to 7 %<sup>(7-8,12,16,23)</sup>. Approximately 16 % of patients with spinal metastasis have a pathological compression fracture and spinal cord compression<sup>(20)</sup>. A case of colonic adenocarcinoma operated for multiple spinal metastasis and C7 cervical pathological compression fracture was presented with a literature scan. In this case, adenocarcinoma which is widespread in the body has been

detected in the advanced tests performed as a result of pathological compression fracture in C7.

### CASE REPORT

A 51- year old man presented to our emergency department with neck pain and right arm weakness. Neurological examination revealed increased reflexes, monoparesis in the right upper extremity. He hasn't got trauma history. These findings were compatible with upper motor neuron disease, cervical disc pathology. Whole spine magnetic resonance imaging (MRI) and cervical spine computed tomography (CT) studies showed a lesion which was invading and destructing C7 vertebral body, narrowing the spinal channel and compressing the spinal cord (Figure-1 and 2).

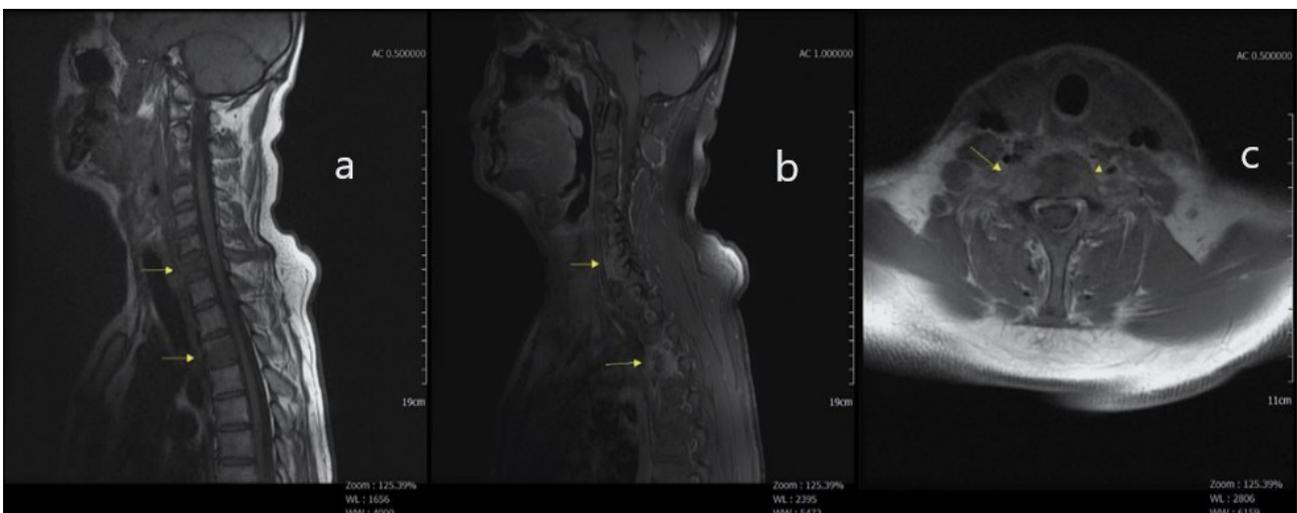
Our differential diagnosis was included primary bone tumor and metastatic tumor. All spinal MRI showed compression fracture in C7 vertebrae, diffuse bone marrow edema and posterior contrast mass in the right lateral vertebral body. In addition, extensive bone marrow edema was observed in T3, T5, T6, T10, T12, L1, L4, L5 vertebrae corpus and diffuse homogeneous enhancement in

post contrast series. In the differential diagnosis, the first line of metastasis is considered, but there are active schmorl nodules, Anderson lesions and seronegative spondyloarthropathies. In abdominal and thorax CT examinations performed for metastatic tumor, irregular tumoral wall thickness increase along the 6 cm segment starting from 2 cm proximal to the anal tax and spicular extension to perirectal oily planes were

observed. The largest in the liver was 2 cm in diameter and metastatic foci in the right lung. C7 metastasis-associated pathological compression fracture confirmed patient underwent anterior cervical corpectomy and stabilization operation. Histopathological examination revealed a metastatic lesion of adenocarcinoma. The patient was discharged 1 week later with his deficit improved.



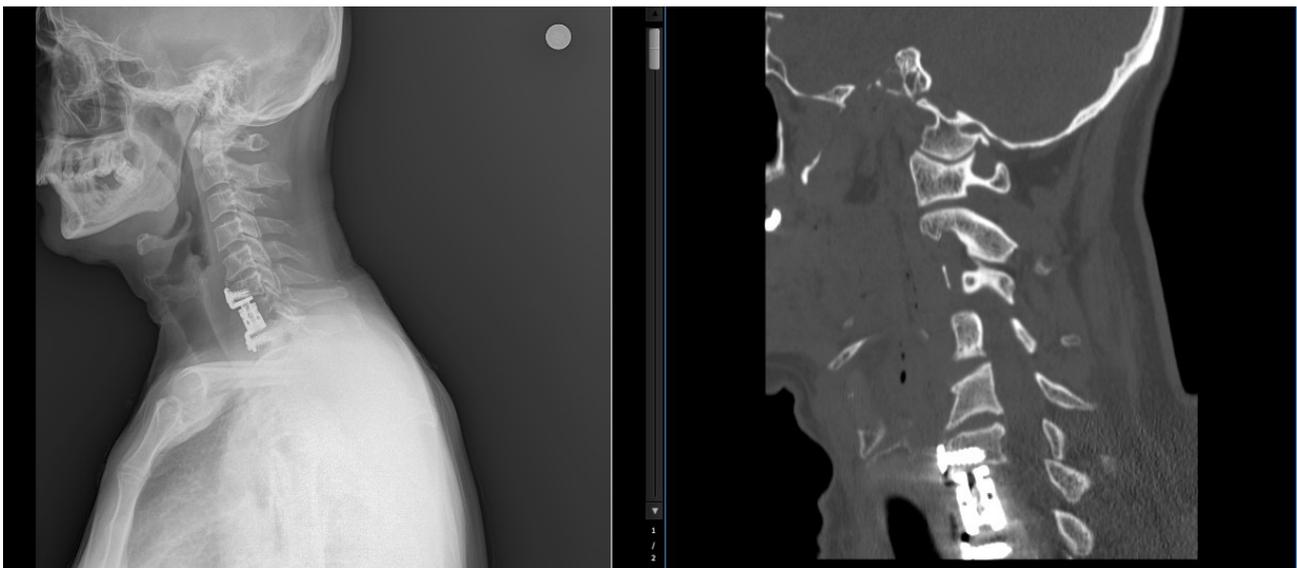
**Figures-1. (a)** Sagittal reformat of CT scan shows that C7 compression fracture. Other cervical vertebral corpus are preserved. **(b)** Vertebral corpus destruction is diagnosed on axial CT image at the level of C7 vertebra.



**Figures-2. (a)** Midsagittal T1-W MRI shows that C7 compression fracture and loss signal of C7 and third thoracic vertebrae. **(b)** Parasagittal postcontrast T1-W MRI, the neural foramina are obliterated with soft tissue. **(c)** Postcontrast transverse T1-W MRI, the right neural foramen is obliterated with soft tissue and seen destruction of C7 corpus.



**Figures-3.** Lumbar spine of the same patient, **(a)** parasagittal T1-W MRI, multiple hypointense metastatic lesions are seen. **(b)** Midsagittal T2-W MRI, no sign of compression fracture or soft tissue mass. **(c)** Parasagittal STIR MRI sequence, multiple hyperintense metastatic lesions are seen.



**Figures-4.** **(a)** Lateral cervical spine radiography, anterior cervical corpectomy, and fusion with instrumentation and loss of cervical lordosis are seen. **(b)** Parasagittal reformate CT, postoperative instrumentation materials are demonstrated.

## DISCUSSION

Previously reported colorectal-induced spinal metastases were located in the sacrum and thoracic spine, mainly in the lumbar spine <sup>(14,20,23)</sup>. Metastasis was thought to be the result of direct vascular access from the pelvis <sup>(25)</sup>. It is thought to be responsible for spinal metastases of the vertebral venous plexus defined by Batson in 1940 and shown using radiographic methods by contrast material by Coman and Delong <sup>(5,10)</sup>. By this mechanism, it is likely that prostate cancer will often spread to the lumbar spine and sacrum <sup>(12)</sup>. Cervical

spine metastases have not been identified as a common in colorectal carcinoma and are not likely to occur with vertebral plexus of Batson in the absence of lumbar spine or sacral metastasis <sup>(12)</sup>. Bayraklı et al. reported a case of colon cancer that metastasized to the cervical spine without metastasizing to the liver and regional lymph nodes <sup>(6)</sup>. In our case, there was liver, lung and diffuse vertebral spread. Despite widespread involvement, the patient's right arm was diagnosed after pain and weakness. Colorectal adenocarcinoma usually has insidious onset and indicates progressive. Advances in medical treatment have improved survival in patients with

colorectal metastasis. However, long survival caused an increase in bone metastasis <sup>(17)</sup>.

Radiotherapy and / or chemotherapy have limited benefit in gastrointestinal metastases. Several studies have shown that only a small number of patients with colorectal origin of metastatic spinal disease gain benefit only after chemoradiotherapy treatment <sup>(25)</sup>. However, as adjuvant therapy, these modalities play an important role in the treatment of these patients <sup>(13)</sup>. Vertebroplasty and radiotherapy are alternatives for patients with a presumed short survival or those who cannot tolerate surgery <sup>(26)</sup>.

The main objectives of surgery in patients with spinal metastasis are pain reduction, prevention of neurological deficit, protection and recovery of spinal stability.

In the literature, there are few case reports and small case series evaluating the surgical treatment of these patients <sup>(4,9,23,25)</sup>. Leach et al. reported that long-term survival and symptomatic recovery were possible in some cases with metastatic spinal lesions of colorectal origin, but survival was poor in most cases <sup>(17)</sup>. In our case, there was pain and monoparesis in the right arm due to C7 compression fracture. In the advanced radiological imaging, widespread spinal metastases as well as extensive organ metastases were detected. The patient underwent corpectomy and stabilization with anterior approach and improved his neurological deficit and mobilization.

In conclusion, in patients with metastatic spinal fractures with or without neurological deficits, radiographically imaging should not be limited with a single region, whole spinal column should be screened. It should be kept in mind that surgical decompression and stabilization contribute to mobilization and quality of life, especially in patients with neurological deficits.

#### **Conflict of interest:**

The authors declare that there are no conflicts of interest.

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None

#### **Type of contribution of the authors:**

MEA wrote and prepared the manuscript, and all of the authors participated in the study design. All authors have read, reviewed, and approved the article.

## **REFERENCES**

1. Antar V, Baran O, Yuceli S, Erdogan H, Altintas O, Baran GE, Tasdemiroglu E. Assessment of the neuroprotective effects of the acetylcholinesterase inhibitor huperzine A in an experimental spinal cord trauma model. *J Neurosurg Sci* 2018; 62(2): 128-139.
2. Arrigo RT, Kalanithi P, Cheng I, Alamin T, Carragee EJ, Mindea SA, Park J, Boakye M. Predictors of survival after surgical treatment of spinal metastasis. *Neurosurgery* 2011; 68: 674-681.
3. Bacon HE, Gilbert PD. Sites of metastases from carcinoma of the anus, rectum and sigmoid colon. *JAMA* 1938; 111: 219-221.
4. Bartels RH, van der Linden YM, van der Graaf WT. Spinal extradural metastasis: review of current treatment options. *CA Cancer J Clin* 2008; 58: 245-259.
5. Batson OV. Function of vertebral veins and their role in spread of metastases. *Ann Surg* 1940; 112: 138-149.
6. Bayraklı F, Gurekli M, Kurt, Egilmez R. Cervical spinal metastasis as first sign of colon cancer. *Sinir Sistemi Cerrahisi Dergisi* 2010, 3(1): 35-38.
7. Besbeas S, Stearns MW Jr. Osseous metastases from carcinomas of the colon and rectum. *Dis Colon Rectum* 1978; 21: 266-268.
8. Bonnheim DC, Petrelli NJ, Herrera L, et al. Osseous metastases from colorectal carcinoma. *Am J Surg* 1986; 151: 457-459.
9. Brown PD, Stafford SL, Schild SE, Martenson JA, Schiff D. Metastatic spinal cord compression in patients with colorectal cancer. *J Neurooncol* 1999; 44: 175-180.
10. Coman DR, Delong RP. The role of the vertebral venous system in the metastasis of cancer to the spinal column. *Cancer* 1951; 4: 610-618.
11. Çeçen DA, Tatarlı N, Süslü HT, Özdoğan S, Barışık NÖ. Primary dural spinal lymphoma presentation of a rare spinal tumor case. *Case Reports in Surgery* 2015; 2015: 639253.
12. Geh JI, Glynne-Jones R. Cervical spine involvement in metastatic colorectal carcinoma, *Clin Oncol (R Coll Radiol)* 1998; 10(2): 125-128.
13. Hanna WC, Ponsky TA, Trachiotis GD, Trachiotis GD, Knoll SM. Colon cancer metastatic to the lung and the thyroid gland. *Arch Surg* 2006; 141: 93-96.
14. Kanthan R, Loewy J, Kanthan SC. Skeletal metastases in colorectal carcinomas: a Saskatchewan profile. *Dis Colon Rectum* 1999; 42: 1592-1597.
15. Katoh M, Unakami M, Hara M, Fukuchi S. Bone metastasis from colorectal cancer in autopsy cases. *J Gastroenterol* 1995; 30: 615-618.
16. Kazancı B, Ozdoğan S, Kahveci R, Gokce EC, Yigitkanlı K, Gokce A, Erdogan B. Neuroprotective effects of pregabalin against spinal cord ischemia-reperfusion injury in rats. *Turk Neurosurg* 2017; 27(6): 952-961.

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17. Leach MR, Lau D, La Marca F, Park P. Outcomes after surgery for spinal metastasis of colorectal origin: case series, *Asian Spine J* 2014; 8(3): 267-272.
  18. Martenson JA Jr, Evans RG, Lie MR, Ilstrup DM, Dinapoli RP, Ebersold MJ, Earle JD. Treatment outcome and complications in patients treated for malignant epidural spinal cord compression (SCC). *J Neurooncol* 1985; 3: 77-84.
  19. Platell CF. Changing patterns of recurrence after treatment for colorectal cancer. *Int J Colorectal Dis* 2007; 22: 1223-1231.
  20. Santini D, Tampellini M, Vincenzi B, Ibrahim T, Ortega C, Virzi V, Silvestris N, Berardi R, Masini C, Calipari N, Ottaviani D, Catalano V, Badalamenti G, Giannicola R, Fabbri F, Venditti O, Fratto ME, Mazzara C, Latiano TP, Bertolini F, Petrelli F, Ottone A, Caroti C, Salvatore L, Falcone A, Giordani P, Addeo R, Aglietta M, Cascinu S, Barni S, Maiello E, Tonini G. Natural history of bone metastasis in colorectal cancer: final results of a large Italian bone metastases study. *Ann Oncol* 2012; 23: 2072-2077.
  21. Stewart D, Kitsanta P, Hampton J, Shorthouse A. Asymptomatic isolated coccygeal metastasis in low rectal carcinoma. *Tech Coloproctol* 2011; 15: 349-351.
  22. Su YF, Lieu AS, Lin CL, Lee KS, Hwang YF, Yen CP, Chang CZ, Loh JK, Huang TY, Hwang SL, Kwan AL, Howng SL, Wang CJ. Analysis of surgically treated intraspinal tumors in southern Taiwan. *Kaohsiung J Med Sci* 2007; 23: 573-578.
  23. Talbot RW, Irvine B, Jass JR, Dowd GS, Northover JM. Bone metastases in carcinoma of the rectum: a clinical and pathological review. *Eur J Surg Oncol* 1989; 15: 449-452.
  24. Tomita K, Kawahara N, Kobayashi T, Yoshida A, Murakami H, Akamaru T. Surgical strategy for spinal metastases. *Spine* 2001; 26: 298-306.
  25. Vider M, Maruyama Y, Narvaez R. Significance of the vertebral venous (Batson's) plexus in metastatic spread in colorectal carcinoma. *Cancer* 1977; 40: 67-71.
  26. Witham TF, Khavkin YA, Gallia GL, Wolinsky JP, Gokaslan ZL. Surgery insight: current management of epidural spinal cord compression from metastatic spine disease. *Nat Clin Pract Neurol* 2006; 2: 87-94.
  27. Yuceli S. Facet Cysts. *JTSS* 2018; 29(4): 219-221.