

Spinal cord compression as the initial presentation of colorectal cancer: case report and review of the literature

Magdalena M. Gilg¹, Gerhard Bratschitsch¹, Ulrike Wiesspeiner², Roman Radl¹, Andreas Leithner¹ and Cord Langner³

Abstract

Background: Malignant spinal cord compression (MSCC) is most frequently seen in patients with breast, prostate and lung cancer. Five percent to 25% of MSCC cases occur as the initial presentation of malignancy.

Case report: We report the case of a 43-year-old male patient with sudden onset of incomplete paraplegia. Imaging revealed spinal cord compression at the level TH 3/4 and TH 8. Emergency decompressive surgery with tumour biopsy was performed. Two days after surgery, the patient developed large bowel obstruction, and a sigmoid tumour was identified as underlying cause. The sigmoid tumour was diagnosed as colorectal adenocarcinoma, and histological examination of the spinal tumour confirmed metastatic disease.

Conclusion: MSCC may be the initial presentation in patients with neoplastic disease, and also tumours that only very rarely metastasize to the skeletal system have to be included in differential diagnosis. Obtaining biopsy material during surgery is crucial to establish a definitive diagnosis.

¹ Department of Orthopedic Surgery, Medical University of Graz, Auenbruggerplatz 5, 8036 Graz, Austria

² Department of Radiology, Medical University of Graz, Auenbruggerplatz 9, 8036 Graz, Austria

³ Institute of Pathology, Medical University of Graz, Auenbruggerplatz 25, 8036 Graz, Austria

Corresponding Author:

Magdalena M. Gilg

Department of Orthopedic Surgery, Medical University of Graz, Auenbruggerplatz 5,
8036 Graz, Austria

Tel. +43 316 385- 14807

E-mail: magdalena.gilg@outlook.com

Introduction

Colorectal carcinoma is the third most common malignant tumour in males and the second one in females. Metastatic spread may be detected in virtually any organ, with the liver and the lungs being the most common sites [1]. Metastasis to the spine is a rare event and is considered to occur late in the disease course [2, 3].

Malignant spinal cord compression (MSCC) is one of the most serious complications of cancer and may be caused by nearly all types of malignancy but is most frequently seen in patients with breast, prostate, lung or renal cancer [4]. Between 5% to 25% of MSCC cases occur as the initial presentation of malignancy [2]. Herein, we report the case of a patient with colorectal cancer who presented with MSCC as the initial symptom.

Case Report

A 43-year-old male patient with no relevant past medical history presented with sudden onset of incomplete paraplegia within the last twelve hours. The patient had suffered from thoracolumbar back pain for five weeks and felt insecure when walking the day before. Upon presentation the patient had no motor function of the lower extremities except for a grade one out of five in quadriceps muscle strength and a grade two out of five in plantar flexion strength on the ASIA muscle grading system. Sensory function was absent below TH 7 level.

Computed tomography of the thoracic spine showed multiple bone metastases at the level TH3/4 and TH9/10 (Fig. 1 A). Spinal magnetic resonance imaging was performed and revealed multiple heterogeneously contrast enhancing lesions in the whole spine and severe MSCC at level TH3/4 and TH8 (Fig. 1 B).

Emergency decompressive surgery for dorsal fusion from TH2-TH5 and TH7-TH9 including biopsy was carried out. Two days postoperatively the patient developed symptoms of large bowel obstruction and underwent emergency operation in which a large sigmoid tumour was identified as underlying cause. Upon histology the sigmoid tumour was diagnosed as colorectal adenocarcinoma. Histological examination of the spinal tumour confirmed metastatic disease. Staging with computed tomography scans of the lungs, abdomen and brain did not detect further metastases. Eight days after initial presentation the general condition of the patient worsened rapidly and he died of progressive respiratory failure.



Figure 1:

A: Sagittal CT reconstruction: Multiple bone metastases at level TH 3/4 and TH 9/10

B: Axial MRI (T1 TSE + contrast agent): soft tissue mass extending into the neural foramen (arrow) and spinal canal stenosis with epidural extension and consecutive MSCC (open arrow) at level TH 3/4.

The primary tumour within the large bowel turned out to be a poorly differentiated adenocarcinoma with prominent solid tumour growth and signet-ring cell component, vascular and perineural invasion (Fig. 2 A and B). The

tumour extended through the bowel wall, perforating the visceral peritoneum. Regional metastatic spread was identified in 17 lymph nodes. Expression of MLH1, MSH2, MSH6, and PMS2 in tumour tissue excluded the presence of Lynch syndrome (hereditary non-polyposis colorectal cancer). After decalcification of the biopsy material, the spinal tumour likewise turned out to be a poorly differentiated adenocarcinoma with prominent solid tumour growth. The lesion was positive for Keratin 20, yet negative for Keratin 7. Nuclear expression of the transcription factor CDX-2 proved the intestinal origin of the metastatic disease (Fig. 2 C and D). This expression pattern proves the large bowel adenocarcinoma as origin of the metastatic tumour growth. At autopsy multiple minute cancer foci, often within lymphatic vessels (lymphangiosis carcinomatosa) were identified within lungs and liver as well as retroperitoneal and mediastinal lymph nodes.

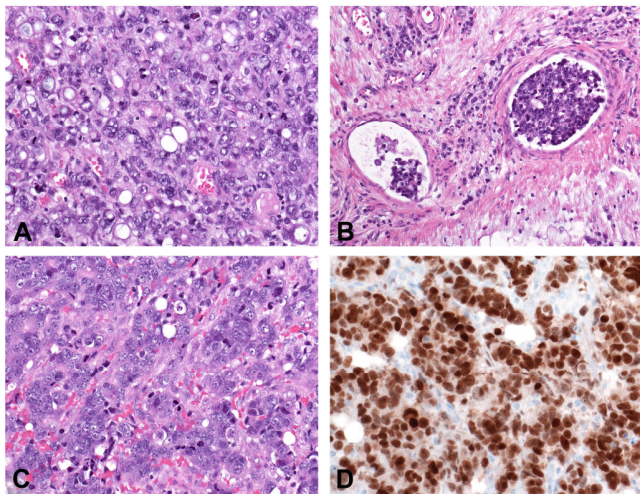


Figure 2:

Primary tumour: Poorly differentiated adenocarcinoma with prominent solid tumour growth (A) and prominent vascular invasion (B). Spinal metastasis: poorly differentiated adenocarcinoma with marked nuclear pleomorphism and high mitotic activity (C). The

tumour cells express nuclear transcription factor CDX-2 (D), proving intestinal origin of metastatic cancer tissue.

Discussion

In malignant disease, the lungs and liver represent the most common sites for metastatic dissemination, followed by the skeletal system with the spinal column being the most frequent localization [5]. Cancers of lungs, breast, and prostate as well as renal cell carcinoma are the most frequent primaries [6-8]. Overall, MSCC has been estimated to occur in approximately 2.5% of patients with advanced tumour stage [4]. In advanced stages of colorectal cancer, tumour deposits are typically found in liver and lungs [1]. Metastasis from colorectal cancer to the skeletal system is generally rare and, to the best of our knowledge, MSCC as the initial symptom, as shown in our case has not been reported before.

The 5-year relative survival rate for patients diagnosed with colorectal cancer between 2003 and 2009 was 64.9% in the United States [9]. In patients with distant metastases at initial diagnosis the 5-year survival rate decreases to 12.5% [9]. Brown et al. [10] observed a median survival rate of 4.1 months in 34 patients with colorectal cancer and MSCC.

Regarding clinical symptoms, the majority of patients (83- 95%) with spinal metastases presents with pain which can either be radicular, axial or local depending on the exact localization of the tumour [5]. In one study, a median time interval of 3 months passed between the onset of pain reported to a primary care facility and the manifestation of MSCC [11]. Motor function loss is the second most frequent symptom, occurring in approximately 60-85% of patients. Sensory loss is regarded as a symptom that will always result in complete paraplegia unless surgical

decompression is carried out [5]. In order to distinguish benign back pain from severe causes such as MSCC the concept of “red flags” is widely accepted [12, 13]. In our patient, in addition to neurological deficits, thoracic pain localization and the presence of pain for more than one month were observed, which, among others, are regarded as typical “red flags” symptoms which should prompt further clinical evaluation of the patient [13].

Conclusion

Symptoms related to spinal cord compression may be the initial presentation in patients with

malignant disease. Red flags, such as new onset of persistent back pain with atypical location, should always prompt further radiological evaluation, in particular by magnetic resonance imaging. It is of note that also tumours that only rarely metastasize to the skeletal system need to be included in differential diagnosis, and young age does not rule out the diagnosis. Obtaining biopsy material during surgery with subsequent careful histopathological evaluation is crucial to establish a definitive diagnosis and further treatment decisions.

References

- Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A, AJCC Cancer Staging Manual. New York: Springer; 2010.
1. Lewis MA, Hendrickson AW, Moynihan TJ. Oncologic emergencies: Pathophysiology, presentation, diagnosis, and treatment. *CA Cancer J Clin.* 2011;61(5):287-314.
 2. Gabriel K, Schiff D. Metastatic spinal cord compression by solid tumors. *Semin Neurol.* 2004;24(4):375-83.
 3. Savage P, Sharkey R, Kua T, Schofield L, Richardson D, Panchmatia N, et al. Malignant spinal cord compression: NICE guidance, improvements and challenges. *QJM.* 2014;107(4):277-82.
 4. 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(2):87-94; quiz 116.
 5. Wibmer C, Leithner A, Hofmann G, Clar H, Kapitan M, Berghold A, et al. Survival analysis of 254 patients after manifestation of spinal metastases: evaluation of seven preoperative scoring systems. *Spine.* 2011;36(23):1977-86.
 6. White AP, Kwon BK, Lindskog DM, Friedlaender GE, Grauer JN. Metastatic disease of the spine. *J Am Acad Orthop Surg.* 2006;14(11):587-98.
 7. Patchell RA, Tibbs PA, Regine WF, Payne R, Saris S, Kryscio RJ, et al. Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomised trial. *Lancet.* 2005;366(9486):643-8.
 8. Siegel R, Desantis C, Jemal A. Colorectal cancer statistics, 2014. *CA Cancer J Clin.* 2014;64(2):104-17.
 9. Brown PD, Stafford SL, Schild SE, Martenson JA, Schiff D. Metastatic spinal cord compression in patients with colorectal cancer. *J Neurooncol.* 1999;44(2):175-80.
 10. Levack P, Graham J, Collie D, Grant R, Kidd J, Kunkler I, et al. Don't wait for a sensory level--listen to the symptoms: a prospective audit of the delays in diagnosis of malignant cord compression. *Clin Oncol (R Coll Radiol).* 2002;14(6):472-80.
 11. Raison NT, Alwan W, Abbot A, Farook M, Khaleel A. The reliability of red flags in spinal cord compression. *Arch Trauma Res.* 2014;3(1):e17850.
 12. Henschke N, Maher CG, Ostelo RW, de Vet HC, Macaskill P, Irwig L. Red flags to screen for malignancy in patients with low-back pain. *Cochrane Database Syst Rev.* 2013(2):Cd008686.