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# Metastasis of ovarian cancer to the spinal cord — case study

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### ABSTRACT

Spinal cord metastatic cancer occurs very rarely in clinical setting. There are only several hundred such cases described. Out of those, in the English PubMed database there are only 7 cases of metastasis of ovarian cancer available. Ovarian cancer spinal cord metastases are usually located in the thoracic part (next — in the cervical spine and in the medullary cone). They may manifest with weakening of muscle strength and sensibility, more rarely in sphincters function disorders. In diagnostics, the magnetic resonance imaging (MRI) with contrast is the test of choice. In treatment, chemotherapy, radiotherapy (including radiosurgery) and surgery are applied. Unfortunately, prognosis for this cancer is poor.

Below there is a description of a case of a 66-year-old patient with 2-year history of serous ovarian cancer treatment. Due to progression of paresis of lower limbs type, spine MRI with contrast was performed and it revealed metastatic lesion in the spinal cord at the level of the medullary con. In the paper, the postoperative result of pathology examination is described.

**Key words:** metastasis, spinal tumor, ovarian cancer, surgery

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### Introduction

Ovarian cancer constitutes 4.6% of all cancers among women in Poland [1]. Serous carcinoma is the most frequent group of ovarian cancers; they are diagnosed in 75% of cases. In most cases ovarian cancer expands to organs and lymph nodes of pelvis and abdomen [2]. Distant secondaries are most frequently found in the liver, lymph nodes, lungs, brain metastasis and bones [3]. It is worth noting, that ovarian cancer metastasis to the spinal cord are extremely rare. In the English PubMed database, there are only 7 such cases, out of which, 4 are verified by pathology examination test [4, 5].

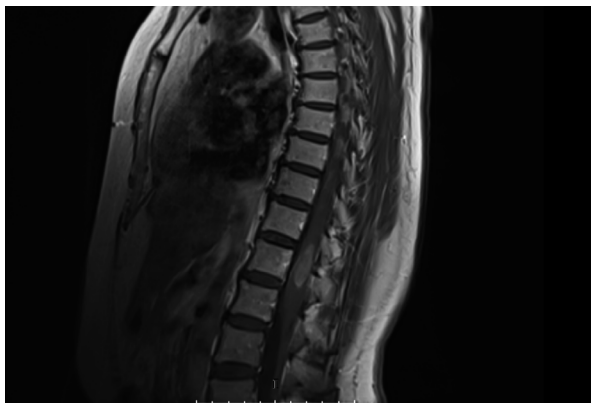
### Case study

Patient — 66-year-old woman with the diagnosis of serous ovarian cancer — had a history of 24-months treatment. She had surgical resection of greater

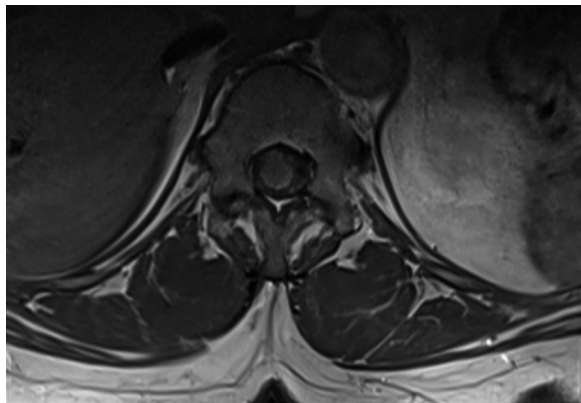
omentum mass infiltrating the transverse colon. Pathology examination revealed serous ovarian cancer metastasis. She received postoperative chemotherapy. About 6 months after the initial diagnosis, patient was treated surgically again — hysterectomy with bilateral salpingo-oophorectomy was performed. Due to the disease progression (metastases in cervical, gastric and retroperitoneal lymph nodes) chemotherapy was administered again.

She was admitted to the Neurosurgery Department due to the worsening of symptoms of lower limbs spastic paresis within range of lower leg and thigh muscles with accompanying exteroceptive and proprioceptive sensory disorders from navel level. Symptoms progressed within 4 weeks.

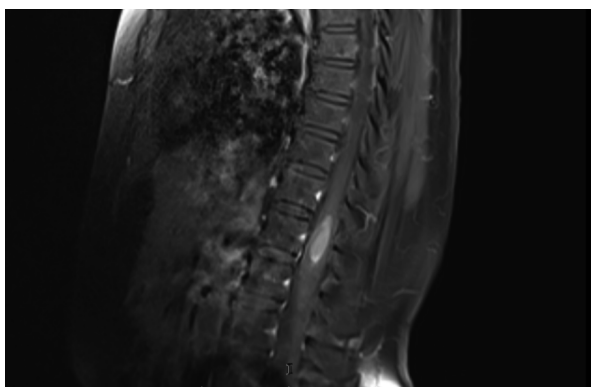
On examination, the patient presented paresis of the right limb within range of flexion and stretching of the hip and knee and within range of dorsiflexion and plantarflexion of the right foot (1/5 in Lovett scale). In case of the left lower limb, the paresis occurred within



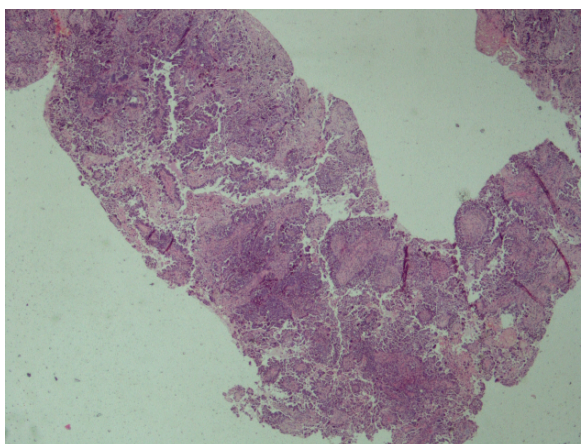
**Figure 1.** MRI examination in sagittal T1 projection enhancing a hyperintense intraspinal lesion at Th12 level



**Figure 3.** MRI examination in T1 projection with contrast, transverse section. Visible lesion intramedullary lesion



**Figure 2.** MRI examination in T1 projection with contrast. Enhanced lesion



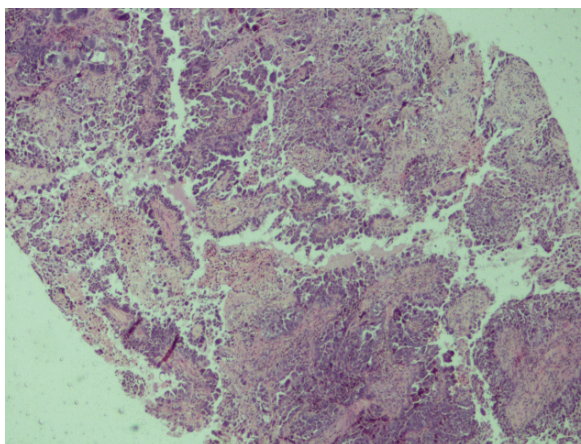
**Figure 4.** Pathology result on H&E 20× examination

aspect of flexion and stretching of the hip and knee joints (Lovett 2/5) and within the aspects of dorsiflexion and plantarflexion of the left foot (Lovett 3/5). No sphincter disorders were diagnosed.

Spinal magnetoc resonance imaging (MRI) showed focal lesion (28 mm I diameter), located intramedullary at the height of Th12, enhanced after contrast (Figs 1–3) was observed.

She was qualified for surgery and Th12 laminectomy was performed with subsequent radical resection of the spinal cord tumour. The tumour was examined histologically (Figs 4–7).

Gradual regression of neurological symptoms was observed following surgery. Patient was discharged on the fourth day after surgery. On discharge, patient presented 3/5 paresis of the right limb within aspect of flexion and stretching in the hip and joint and within aspect of dorsiflexion and plantarflexion of the of foot. On the left side there was 4/5 paresis within aspect of flexion and stretching in the hip and knee joint and dorsiflexion and plantarflexion of foot. Further history of the patient is unknown.



**Figure 5.** Pathology result on H&E 40× examination

## Discussion

Spinal canal tumours can be divided into epidural and intradural; whereas, the intradural lesions may be

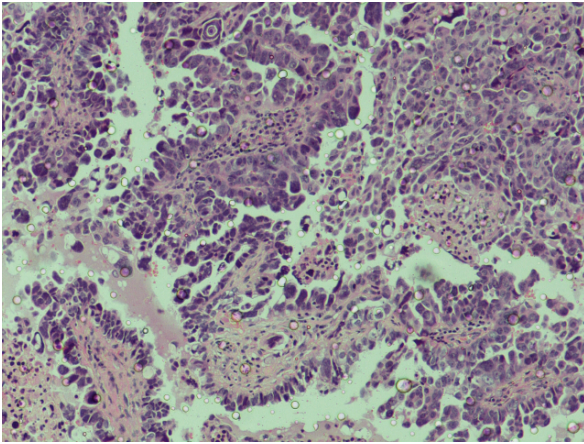


Figure 6. Pathology result on H&E 100× examination

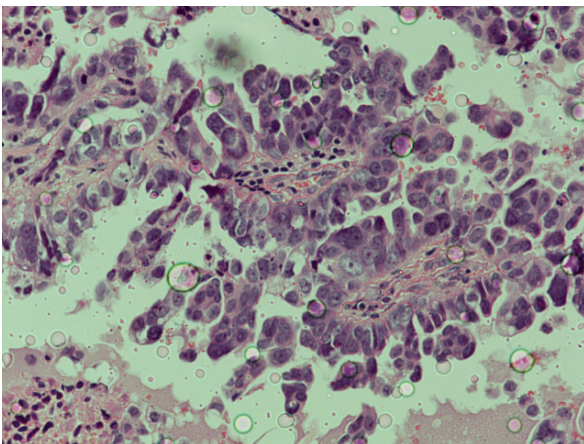


Figure 7. Histopathological result in H&E 200× examination

intramedullary and extramedullary. Intramedullary spinal cord tumours (IMSCT) constitute 5% of all spinal canal tumours; whereas, the most common IMSCT are astrocytoma (30%), ependymoma (30%) and other (30% — malignant glioblastoma, dermoid, epidermoid, teratoma, lipoma, hemangioblastoma, neuroma). Very rare IMSCTs include lymphoma, oligodendroglioma and cholesteatoma. Intraspinal intramedullary metastases are extremely rare. Within the literature there are several hundred of such cases described [6].

They are usually diagnosed at the age of 55–57 years and more frequently in women [8–10]. Majority of spinal cord metastases are from lung cancer and (23–51%) breast cancer (13.7–18.6%). The incidence of spinal cord secondary deposits from other cancers differs (kidney cancer, melanoma, primary brain tumour, lymphoma, colorectal cancer) [6, 8–10].

IMSCT occurs usually as a single lesion in the spinal cord; however, in case of near 20% there were 2 or more metastatic foci [8, 10].

Intraspinal metastases are usually located in the thoracic spinal cord (50–57%), cervical spine (23–33%) and medullary cone (14–23%). In the spinal cord transition sections, i.e. in the cervical-thoracic and thoraco-conical, they are seen in 3% and 1%, respectively [8–10].

IMSCT reveal in occurrence of neurological symptoms resulting from myelopathy. Muscle weakening is seen most frequently (57–71%). Sensory disorders occur in 16–40% of the examined patients and sphincter dysfunctions in 10–20%. Pain and asymptomatic symptoms are observed in less than 10% of patients [8–10].

In diagnostics, the MRI with contrast is the test of choice. Among other tests used in diagnostics, also the lumbar puncture and computed tomography (CT) with contrast are indicated, while in differential diagnosis in case of other types of tumours and changes in the spinal cord, occasionally other tests (radiography, myelography or angiography of the spinal cord arteries) are being used [6].

In the MRI test with contrast, intraspinal metastases usually localise eccentrically, slightly less often centrally, and sporadically they are exophytic. In the vast majority they are well delineated. In about 2/3 described cases, spinal cord compression is described. In 98% it is enhanced after applying contrast. Enhancement is equally heterogenous and homogenous. In T2 projection, in 80% the signal is signal hyperintense, more rarely isointense and very rarely hypointense. In T1 projection, signal is in near 75% isointense, while in other cases it is hyperintense or hypointense [8].

Treatment is decided individually considering patients' age, disease extent, presence of neurological symptoms or tumour location. The non-surgical approach (i.e. applying generalized anti-edema drugs with radiotherapy) is the dominant treatment in case of patients with a diagnosed metastasis to spinal cord. Surgery seems to be a second-line treatment [11, 12]. CyberKnife radiosurgery may be also applied. Survival of patients treated conservatively is in a range of 4 months [13].

Unfortunately, survival time of those patients is very unfavourable. Depending on the examination method, while applying the conservative treatment, the survival time was from 3 to 5 months [9, 10, 14]. Studies comparing non-surgical and surgical treatment showed better survival time of patients after resection — it was in a range of 6–12 months [9, 10, 14]. However, as the authors highlight, the patients treated surgically are preselected ones, and in all cases single lesions were found [10]. In the vast majority of cases, surgical treatment was performed from the posterior approach, by means of one or multi-level laminectomy, depending on the size of tumour. The reselection range depended mainly on the possibility of intraoperative determination of tumour boundaries and technical possibilities of tumour removal [9, 10].

## Conclusions

Intraspinal metastases are tumours described progressively more often. Time and quality of patients' life is very bad. There are no clear standards regarding treatment of those tumours. In case of preselected patients with a single intramedullary lesion, surgical treatment can extend the survival time.

## Conflict of interest

The authors declare no conflict of interest.

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