

Treatment of Spinal Cord Cancer Metastases

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Treatment of vertebral epidural cancer metastases has been in the past and still remains an attempt to improve the quality of life of the patients. The purpose of our work was to evaluate the incidence, clinical symptoms, treatment and outcome of spinal cord cancer metastases.

In 1980 through 1994 we treated 237 patients with spinal cord tumors, among them 22 (9.2%) with cancer metastases. Carcinoma of the prostata, lung and kidney was observed in 9.1% each, others in 22.8%, and adenocarcinoma of breast and unknown origin in 31.8% of patients. Pain was not an indication for operative decompression, but it was the early symptom that led the patients to doctors. Complete paraplegia never improves. Incomplete spinal cord compression followed by decompression surgery and / or radiotherapy may improve the neurological deficit and quality of life of patients.

Key words: spinal cord, cancer metastases, spinal cord compression, treatment

INTRODUCTION

Spinal cord and cauda equina compression is a disabling complication of malignancies. Epidural metastases are reported in 5% of cancer patients (1–3). Even secondary tumors that affect the central nervous system have a tendency to produce paralysis and other severe neurological deficits. Spinal cord compression is accompanied by a severe back and radicular pain, sensory, gait and sphincter disorders. It is supposed that asymptomatic intraspinal metastases are more common than symptomatic (4). The initial symptoms ought to lead to diagnostic procedures before a severe motor deficit develops. An early diagnosis of compression syndrome is very essential, because the neurological condition of the patient predetermines the outcome of treatment. There is no common opinion whether decompressive laminectomy, radiotherapy or their combination is a choice method of treatment. Paraplegia and tetraplegia lasting more than 6–12 hours is a contraindication for surgery. Five to 12% of patients become neurologically worse after surgery (5–9).

MATERIALS AND METHODS

We have treated 237 patients with spinal cord tumors in Neurosurgical Clinic of Kaunas Medical University Clinics in 1980 through 1994. There were 22 (9.2%) patients with cancer metastases.

The diagnosis was specified by neurological plain X-ray, contrast enhanced myelography with In¹¹¹, Tc^{99m}, myelography with omnipaque CT. MRI was not available at that time. Surgical treatment consisted in decompressive laminectomy and tumor removal at the level of a block determined by myelography or CT. Data analysis was performed by Epiinfo and Statistica programmes.

Decompressive laminectomy was performed immediately after myelography. Additional radiotherapy was started within 8–10 days after operation in cases of subtotal tumor removal. Tumor irradiation dose was 45 Gy during 21–30 days, single fraction 2–5 Gy. Even paraplegic patients were operated on but few received radiotherapy. Only four patients were not operated on and received only radiotherapy. Corticosteroids were not used consistently.

RESULTS

The incidence of spinal cord metastases in cancer patients was 22 (9.2%) from 237 cases. There were 13 (59.1%) males and 9 (40.9%) females. The mean age of patients was 56.1 ± 12.2 years (range, 19–71 years). The age distribution is shown in Fig. 1. The highest incidence was in the 5–7 decades. Table 1 shows the primary location and histology of metastases causing spinal cord compression.

Twelve (59.1%) patients were over 60 years of age, 7 (31.8%) were aged 40–50 years, and 2 (9.1%) were

Histology and location of malignancies	Number of cases	Percent
Prostata carcinoma	2	9.1
Kidney carcinoma	2	9.1
Lung carcinoma	2	9.1
Melanoblastoma of skin	1	4.55
Osteoblastoma of vertebral column	1	4.55
Parotid gland carcinoma	1	4.55
Thyroid gland carcinoma	1	4.55
Adenocarcinoma of breast and unknown origin	7	31.8

The main primary sites were prostata and lungs in males and breast in females.

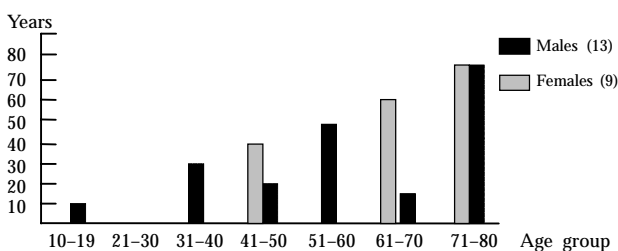


Fig. 1. Age distribution of 22 cancer patients

younger than 40 years. The mean duration of symptoms before hospitalisation was 0.51 ± 0.5 years.

Thoracic localisation of metastases was found in 12 (54.6%), cervical in 2 (9.1%) and lumbar in 8 (36.4%) patients. Thoracic localisation was reliably more frequent in males (84.6%) than in females ($p = 0.001$). The majority (83.3%) of patients with thoracic metastases were paraplegic ($p = 0.005$).

Plain X-ray of the spine was performed to all patients. In 9 cases vertebral body and arch destruction and in one patient sacrum destruction were found. Our patients examined by myelography with In^{111} , Tc^{99m} omnipaque and CT 98% showed a full block caused by epidural metastases deposits, one case of intra-subdural tumor showed a partial block, and one case of paravertebral metastases showed no block at all. The initial symptoms may be sparse, but without treatment they will progress to a complete loss of spinal function below the site of compression.

The most frequent symptom at the onset of compression was radicular pain, which appeared in 90% patients, gait disturbances in 89%, sensory altera-

tions in 83% and sphincter disorders in 60.2%. Of all patients, 45.56% were ambulatory.

Table 2 shows the preoperative motor deficit in patients with cancer metastases.

Character of motor deficit	Number of patients	%
Radiculopathy	6	27.3
Paraparesis	3	13.6
Hemiparesis	1	4.6
Paraplegia	12	54.6

Among patients aged 60 and over paraplegia was found in 10 (76.9%), paraparesis in 2 (15.4%) and radiculopathy in 1 (7.7%). Among patients younger than 60 years, paraplegia was found in 2 (22.2%), paraparesis in 1 (11.1%) and radiculopathy in 5 (35.6%), hemiparesis in 1 (11.1%). Preoperative neurological motor deficit reliably correlated with age ($p = 0.031$). Of the 22 treated patients 18 were operated on. Table 3 shows the results of treatment one month after departure from the Clinic.

Methods of treatment	Number of patients	Improved	Unimproved	Died
Total removal of tumor	5	2	2	1
Only subtotal removal	7	3	4	-
Subtotal removal and radiotherapy	6	2	4	-
Radiotherapy	4	-	4	-

We found only one metastasis of spinal cord in all 22 patients.

Laminectomy and total removal of tumor were performed in 5 (27.7%) cases. Of them, 2 improved, one of them, a paralytic patient, after treatment became ambulatory, 2 did not improve and 1 died because of pulmonary artery embolism. Subtotal removal was applied in 13 (59.1%) cases, of them 5 (38.5%) improved, 8 (61.5%) did not improve. Seven subtotally removed tumors postoperatively irradiated: 3 (42.9%) improved, 4 did not improve and 6 received no radiotherapy after subtotal removal of tumor, of them 2 (33.3%) improved and 4 did not improve. Four patients were treated only with radiotherapy and showed no improvement. Figure 2 shows the general results of treatment.

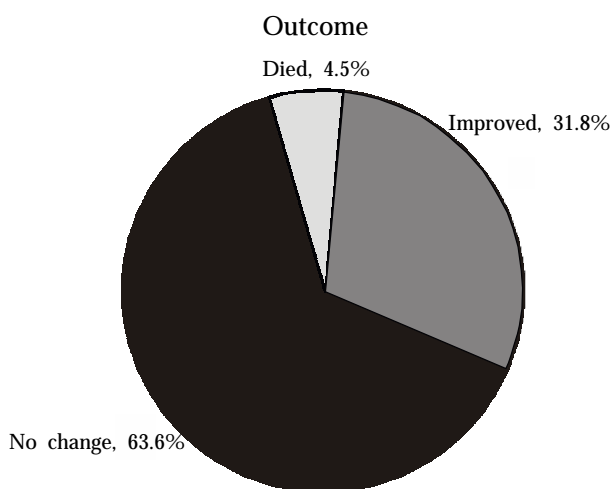


Fig. 2. General results of treatment

Postoperative motor deficit is the most important functional sign after treatment. A total of 45.5% patients who were able to walk before treatment remained out-patient and 4.55% paralytic patients regained their walking ability. As to walking ability, the results depend on the pretreatment ambulatory status. Patients treated with laminectomy followed by radiotherapy responded better than those treated with laminectomy or radiotherapy alone. The only way to improve the prognosis is early diagnosis.

DISCUSSION

Spinal cord compression with cancer metastases is a great problem in neurooncology. The incidence of spinal cord metastases reaches 4.4–6% (1), in our case 9.2%. The distribution of primary malignancies did not differ from other series (5, 6, 8), as did the status of our patients before treatment (45.5% out-patient) (1–3) and after treatment (50% out-patient).

The early symptom preceding spinal cord compression is pain, and epidural metastases are detected by myelography and CT. The treatment is often discussed, because there is no evidence concerning the best treatment modality.

The treatment of spinal cord compression with carcinoma metastases is laminectomy with or without postoperative radiotherapy (5–8). Other authors report that radiotherapy alone is effective (2, 6). Walking ability depends on pretreatment ambulatory status. Patients that have been paralytic for more than 24 hours before treatment are unable to benefit from any treatment. In our case, one patient was paralytic for more than 24 hours, but regained the ability to walk with support. Literature shows that recovery may last even several months and that there is a chance to regain ability to walk in cases of long-lasting paralysis.

The only way to improve the prognosis is early detection of carcinoma metastases. Myelography was rather safe and we did not see any complications. Computer tomography with contrast materials enable a better detection of epidural tumors. Magnetic resonance imaging may allow visualisation of the epidural space and is a method of choice in the diagnosis of metastatic spinal cord compression.

CONCLUSIONS

1. 83.3% of patients with thoracic metastases, mostly men, were paraplegic ($p = 0.005$).
2. Better results were obtained in subtotally removed tumor patients. The value of irradiation was not essential.

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NUGAROS SMEGENŲ VĖPIŲ METASTAZIŲ GYDYMAS

S a n t r a u k a

Šiame darbe aptarėme 22 ligonius (13 vyrų ir 9 moteris, kurių vidutinis amžius $56,1 \pm 12,2$ metų), gydytus dėl nugaros vėpio metastazių. Darbo tikslas – įvertinti kliniki-
nius požymius, gydymą ir baigtą Svarbiausias požymis prieš

operacijà yra motorikos paþeidimas. Radikulopatijos bûklës atvyko 27,3%, su parapareze – 13,6%, hemipareze – 4,6%, paraplegijos bûklës – 54,6% ligoniø. Prieð operacijà galëjo vaikðëiوتي 45,5% ligoniø. Aštuoniolikai ligoniø atlikta laminektomija ir iš dalies arba visiðkai pašalintas navikas, po to taikytas spindulinis gydymas ir paskirti kortikosteroidai. Keturi ligoniai dël išplitusio vëþinio proceso neoperuoti – paskirtas tik spindulinis gydymas. Po opera-

cijos galëjo vaikðëiوتي 50% ligoniø, 31,8% ligoniø bûklë pagerëjo, 63,6% ji nepakito, mirë vienas ligonis (4,5% dël plauëiø arterijos embolijos). Ligoniø, kuriems atlikta laminektomija, naviko ðalinimo ir spindulinio gydymo rezultatai geresni nei tø, kuriems buvo atliktas vien spindulinis gydymas ar laminektomija.

Raktaþodþiai: nugaros smegenys, vëþio metastazës, nugaros smegenø kompresija, gydymas