

## **THE LONG-TERM RESULTS OF SURGICAL MANAGEMENT OF SPINE METASTATIC TUMOURS FROM BREAST CANCER**

GROSMAN R., ROUCHAL M., CHALOUPKA R.

Department of Orthopaedic Surgery, Bohunice Teaching Hospital, Faculty of Medicine,  
Masaryk University, Brno

### **A b s t r a c t**

In a period of 10 years, 32 patients with spine metastases from breast cancer were treated. Most of these women underwent oncological therapy before spine surgery. According to their age and disease prognosis we used a radical approach (anterior or combined surgery) or less radical surgery (decompression). Neurological deficit was present in 40% of the cases, of whom 46% showed improvement following surgery. No deterioration in the neurological status resulted from the surgical treatment.

### **Key words**

breast cancer, metastatic tumour, survival

### **Abbreviations:**

VDS – ventral derotation system, TSHR – Texas Scottish Rite Hospital

### **INTRODUCTION**

Breast cancer is the most common malignant tumour in women. Histologically, there are different kinds of neoplasms, but ductal infiltrated carcinoma found in 80% of breast cancer patients is most frequent (2). Breast cancer may disseminate and produce metastatic tumours in the lymph nodes, liver and bone. Bone metastases are most frequently found in the spine, ribs and pelvis. Metastatic tumours can be osteolytic, osteoplastic or mixed. In this retrospective study, the surgical treatment of spine metastatic tumours from breast cancer is described and its outcome is evaluated.

### **MATERIALS AND METHODS**

In the period of 1989 to 1998, 32 patients with breast cancer who developed skeletal metastases were operated on, two of them twice, in the Department of Orthopaedic Surgery. Their average age at the time of surgery was 55 years (range, 36-78 years). In three patients, the metastatic bone tumour was the first sign of cancer disease. The rest of the group had received antineoplastic therapy before surgery. Twenty four patients had breast surgery, on average four years (range, 4 months to 9 years) before spinal surgery which was followed by actinotherapy and chemotherapy; four women were treated by actinotherapy and chemotherapy and one received only chemotherapy.

*Table 1*  
Neurological status before and after surgery evaluated according to Frankel's classification

Grade	Preop	Postop
A complete sensory and motoric lesion	1	0
B plegia, some sensory function preserved	0	1
C useless motoric activity	8	3
D useful motoric activity	4	8
E normal neurological findings	19	20

### RESULTS

The cervical spine was affected in 11 patients (11 vertebrae were operated on, C4 in five cases), the thoracic spine in 15 patients (17 operated vertebrae, T7 in three cases) and the lumbar spine in 8 women (11 operated vertebrae, L 3 in five cases). Metastases in other vertebrae and in soft organs were found in 17 and 8 women, respectively, at the time of spine surgery.

Neurological involvement was found in 13 patients. Nine women had serious neurological deficits (grade A to C of Frankel's classification; *Table 1*) and, out of these, seven (77.8%) had metastatic osseous lesions in the thoracic spine.

The surgical procedure used in each patient was related to her age and condition (neurological findings, presence of other metastatic tumours) and tumour extent and location. The anterior approach consisting of vertebral body removal was followed by cement replacement in 11 women and by application of Harms' mesh in one patient. An additional anterior fixator was used in four cases (Caspar plate, Kaneda fixator, VDS). Posterior decompression without fixation was employed in six cases (thoracic spine), with fixation in five cases (Hartshill, TSRH, Daniaux and Socon fixators). Combined anterior-posterior surgery was indicated in seven cases, simultaneous two-team surgery in four women (Harms' mesh or bone cement, Miami Moss, TSRH or Daniaux fixators) and consecutive surgery in three cases (autograft or bone cement, Hartshill system). After spine surgery, all patients underwent actinotherapy and chemotherapy

Of the 32 operated women, 20 were followed up and 12 were lost to follow-up. At the time of this retrospective study, seven women were alive and the average follow-up time was 22 months (range, 6 to 60 months; median follow-up, 26 months; *Table 2*). Thirteen patients died; their overall survival time after the surgery was 19 months (range, 5 days to 48 months; median survival, 17 months) (*Table 3*). One woman died on the fifth day after surgery due to large intraoperative blood loss followed by organ failure.

*Table 2*  
Periods of follow-up of the living patients

Time (in months)	Patients
6-12	1
12-24	1
24-36	1
36-48	3
More than 48	1

*Table 3*  
Overall survival time in the deceased patients

Time (in months)	Patients
0-6	2
7-12	2
13-24	6
25-36	1
37-48	2

## DISCUSSION

Surgical removal of spine tumours was only a paliative treatment in the majority of our cases. From all serious neurological deficits (Frankel A-C), 78% were caused by metastases in the thoracic spine . In the patients with metastases in the thoracic spine, neurological disorders were found in 50%. Improvement in neurological conditions was found only in the women who had surgery immediately after the onset of paresis or plegia. Decompression in the case of long-term plegia was usually without improvement, which is in agreement with the results reported by *Onimus et al.* (5).

The overall survival time after surgery was 19 months (median survival, 17 months). Other authors reported a median survival time of 10 months (3), an average survival time of 12 months (5) and a mean survival time of 35.8 weeks (8.3 months) (4). The length of survival is dependent on histological findings, the number of metastatic tumours and oncological therapy. This was used in all patients in our study.

Decompression with or without fixation is indicated at the beginning of development of neurological lesions, elective surgery is performed when an imminent collapse of the vertebral body is threatening, where there is a solitary metastatic tumour or in the case of slow progression of neurological disorder.

Spine surgery usually provides only palliative treatment (1). Its aim is to improve the quality of life, reduce neurological deficits, prevent malignant disease progression and alleviate pain.

*Grosman R., Rouchal M., Chaloupka R.*

## DLOUHODOBÉ VÝSLEDKY OPERAČNÍ LÉČBY METASTÁZ CARCINOMA MAMMAE DO PÁTEŘE

### S o u h r n

Metastázy karcinomu prsu patří mezi nejčastější, tvoří 18 % z celkového počtu 183 metastáz a dokonce 45 % metastáz u žen operovaných na naší klinice za posledních 10 let (celkem 32 pacientek). Ve většině případů šlo o ženy již onkologicky léčené. Vzhledem k věku a prognóze jsme volili radikální přístup (přední a kombinované výkony) případně méně radikální (dekompresní operace). Pozitivní neurologický nález různého stupně jsme zaznamenali u 40 % žen, přičemž ve 46 % došlo ke zlepšení, zhoršení neurologie jsme nezaznamenali. Cílem operační léčby je nejen zastavení celkové progrese tumoru, ale především zlepšení životního komfortu pacientek, zmírnění bolesti a návrat pacientek do rodiny.

### REFERENCES

1. *Atanasiu JP, Badatcheff F, Pidhorz L.* Metastatic lesions of the cervical spine. A retrospective analysis of 20 cases. *Spine* 1993; 18, (10): 1279–1284.
2. *Bednář B, et al.*: Nádory mléčné žlázy. V: *Základy klasifikace nádorů a jejich léčení.* Praha: Avicenum, 1987; 170–5.
3. *Jónsson B, Sjoström L, Olerud C, Andréasson I, Bring J, Rauschnig W.* Outcome after limited posterior surgery for thoracic and lumbar spine metastatic tumours. *Eur Spine J* 1996; 5: 36–44.
4. *Kociałkowski A, Webb JK.* Metastatic spinal tumours: survival after surgery. *Eur Spine J* 1992; 1: 43–48.
5. *Onimus M, Papin P, Gangloff S.* Results of surgical treatment of spinal thoracic and lumbar metastatic tumours. *Eur Spine J* 1996; 5: 407–411.