SURVIVAL OF BREAST CANCER PATIENTS WITH BONE METASTASIS

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ABSTRACT

This study attempted to evaluated the survival of breast cancer patients, who were treated with palliative radiation to the affected matastatic bone regions.

A total of 137 breast cancer patients with evidence of bone metastasis was evaluated. All were treated with external beam radiation to the affected bones, using either Co-60 teletherapy or Linac 6 MV., with tumor doses of 3,000-3,500 cGy, 250-300 cGy per day, five fractions per week. All patients were follow-up closely until dead.

Eighty-seven patients (63.5%) developed only bone metastasis, other fifty patients (36.5%) had associated visceral organs (lungs, brain, liver etc.) metastasis at the same period of bone metastasis. The median survival of patients with associated visceral organs metastasis was 3 months, compared with 7.2 months for the patients with only bone metastasis.

Patients with multiple organs metastasis had short survival, most of them died from brain, or lungs or liver metastasis rather than bone metastasis. Patients with only bone metastasis have better survival and quality of life after palliative radiation.

INTRODUCTION

Breast cancer was the second most common cancer in Thai women,[1] precedented by uterine cervical cancer. Some patients came in with advanced stage, especially patients who lived in the rural areas. These patients were often treated unproperly at the beginning, including indefinite clinical and surgical staging, delayed surgery or delayed systemic treatment. These problems lead to poor treatment out-come, including loco-regional recurrence, and systemic metastasis. Among the systemic metastasis, bone was the most common followed by pulmonary and brain metastasis.

The objective of the retrospective study of breast cancer patients with bone metastasis was to evaluate the survival of the patients who had isolated bone metastasis compared to patients who had combined bone and other organs metastases.

MATERIALS AND METHODS

Patient selection

The records of 137 breast cancer patients with bone metastases, between January 1990 to December 1996 at National Cancer Institute were

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reviewed. This analysis was limited to the data about surgical stage and regimens of adjuvant systemic treatment.

Treatment

All of 137 patients were treated with external beam radiation, to the affected bone regions, using either Co-60 Teletherapy or Linac 6 MV accelerator. Most of them were given with a dose of 3,000 cGy in 10 fractions, a few were given with a dose of 4,000 cGy in 20 fraction, with minimized portal of treatment. For patients with generalized bone metastases (4 anatomical sites). Half body radiation were given with a dose of 500-550 cGy in one fraction.

Follow-up

The records about pain relief, neurological symptoms, radiation toxicity and survival were reviewed.

RESULTS

Table 1 Age Distribution

AGE	NUMBER	PERCENTAGE
20-29	1	0.7
30-39	33	24.1
40-49	37	27.0
50-59	37	27.0
60-69	25	18.2
> 70	4	2.9
TOTAL	**137**	**100**

The Youngest = 28 years old
The Oldest = 84 years old

Table 1, showed the age distribution of the patients in this study. The youngest patients was 28 years old, the oldest one was 84 years old. Peak incidence was between 40-59 years old (about 54%).

Table 2 Classification of metastasis

Metastasis	Number	Percentage
Bone	87	63.5
Multiple organs	50	36.5
Total	**137**	**100**

Table 2, Classification of metastasis, 87 of 137 patients (63.5 %) had only bone metastasis as compare to 50 patients (36.5 %) with multiple organs metastasis.

Table 3 Classifcation of bone metastasis

Bone metastasis	Number of patients	Percentage
- one anatomical site	62	45.3
- more than 1 anatomical site	68	49.6
- generalized (> 4 sites)	7	5.1
Total	**137**	**100**

Table 3, Anatomical sites of bone metastasis, the majority of cases had more than one anatomical sites of bone metastasis.

Table 4 Anatomical distribution

SITE	NUMBER	PERCENTAGE
Skull	3	1.4
C-Spines	19	8.6
T-Spines	73	33.0
L-Spines	49	22.2
Pelvic Bone	14	6.3
Hip, femur	36	16.3
Shoulder	13	5.9
Ribs	7	3.2
Generalized	7	3.2
TOTAL	221	100

Table 4, showed the anatomical distribution of bone metastasis. The most common site was thoracic spines (account about 33%), followed by lumbar spines (about 22.2%), hip and femur (about 16.3%). Only 7 patients came with generalised diffused bone metastasis at the first onset (more than > 4 anatomical regions), 62 patients (about 45.3%) had only one anatomical region of metastasis.

Only 25 patients (about 18.3%) had one recurrent episode of bone pain, other 112 cases (about 81.7%) had more than one recurrent episode of bone pain, and most of them occurred within 2 months after the first treatment.

Table 5 Visceral organs of distance metastasis

ORGAN	NUMBER	PERCENTAGE
Brain	17	30.9
Liver	7	12.7
Lungs	26	47.3
Soft tissue	2	3.6
Other (Generalized)	3	5.5
Total	**55**	**100**

Table 5, showed distribution of visceral organs metastasis. Lungs are the most common organ among visceral metastases (account about 47.3%), followed by brain (account about 31%). 5 patients presented with 2 organs metastases at the first episode, 3 patients had brain and lung metastases, other 2 patients had lung and liver metastases.

Table 6 Subjective response of pain relief

PAIN RELIEF CATEGORY	NUMBER	PERCENTAGE
CR	87	63.5
PR	38	27.7
SR	10	7.3
NC	2	1.5
PD	0	0.0
Total	**137**	**100**

Pain relief Classification :
CR - complete pain relief
PR - partial pain relief more than 50%
SR - some relief less than 50%
NC - no change
PD - progressive disease, or worsening of pain

Table 6, showed subjective response of pain relief after radiation treatment. The majority of patients (87 cases or 63.5%) had complete response of pain relief. 38 patients (27.7%) had partial pain relief. 10 patients (7.3%) had some pain relief. Only 2 patients showed no change of pain. 12 out of 137 patients had symptoms of cord compression, 10 out of 12 had complete recovery of neurological deficit, and 2 out of 12 patients remained paralysis after radiation.

Table 7 Median survival of the patients

	month
patients with bone metastasis	7.2
patients with bone and other visceral metastasis	3

Table 7, showed median survival of the patients. Patients with only bone metastasis had longer survival as compared to patients with bone and visceral metastases. 49 of 50 patients with visceral metastases died within 5 month after onset of metastasis, only 1 patients died at the sixth month after metastases.

Patients with only bone metastasis survived longer, the median survival was 7.2 months.

Table 8 Acute Radiation Toxicity

	grade o	grade 1	grade 2	grade 3	grade 4
Hemoglobin	(none)	25	10	2	0
White blood count	-	15	16	-	-
Platelet count	-	3	10	-	-
Nausea, vomiting	-	20	14	-	-
Diarrha	-	3	3	-	-
Hematuria	-	2	1	-	-
Fever	-	2	7	-	-
Pneumonitis	-	-	-	-	-

Table 8, showed acute radiation toxicity. The majority of cases tolerated well to radiation, only grade 1 toxicity was obverved. No severe or fatal toxicity was demonstrated. Most of the patients with bone marrow and gastro-intestinal toxicity during radiation also had chemotherapy for their visceral metastases.

DISCUSSION

In this study, bone involvement was the most frequent metastasis[2] in breast cancer. Among these, thoracic spines was the most common site, but there were only 12 patients who developed signs of cord compression and 10 of the 12 patients had complete recovery after radiation. The rest did not recover because of late presentation with complete cord compression more than 72 hours.

Most of the patients with visceral organs involvement had extensive systemic chemotherapy who showed some degree of bone marrow suppression, poor tolerance to radiation treatment and shorter survival. None of these patients survived more than 6 months even with extensive chemotherapy. Most of them died within 2-3 months after the onset of multiple organs metastasis, the causes of death, mostly came from pulmonary metastases.

Patients with only bone metastasis yielded longer survival and better performance status.[3] These were 16 of 87 patients survival more than 2 years, 52 of 87 patients survival more than 1 year. Even in patients with generalized bone metastasis, who had half body radiation, 3 of them survival more than 6 months with maintenance of pain relief.[4-5] 27 of 137 patients who had recurrent pain at the radiation sites had received repeated treatment with the same radiation dose, with satisfactory pain relief.[6] Our results showed effective pain relief by radiation as reported in the literatures.

CONCLUSION

Bone metastasis was the most common metastasis in breast cancer. Palliative radiation yielded effective pain relief and recovery of neurological deficit. Most of the patients died from lung, brain, liver metastasis rather than bone metastasis. Proper diagnosis, combined modality of treatment, including surgery, radiation and systemic chemotherapy will improve the survival in breast cancer.

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