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Introduction

Pathologic or iatrogenic symptomatic spinal lesions are common in metastatic breast cancer. Given the longer duration of overall survival provided by modern oncological therapies, a prompt and effective treatment of such lesions may have a significant impact on patient’s quality of life, improving pain and preventing deterioration of neurological functions.

Materials and Methods

A retrospective review was conducted on breast cancer patients operated to the spine between 2005 and 2013. The series include 41 patients and 57 vertebral levels treated (4 cervical, 35 dorsal, 18 lumbar). 28 patients received palliative surgery and 13 excisional surgery, according to their clinical conditions, SINS and Tokuhashi scores,

Results

38 patients out of 41, presented a median survival of 50 months (CI 95% 39-61), still preserving a KPS ≥ 60 and a retained ability to ambulate independently. The median OS after the first spine surgery was also 50 months (CI 35-65), suggesting that in this cohort of patients, a reasonable quality of life was preserved almost to the end of their clinical history. In patient treated with palliative surgery, median survival was 37 months (CI 95% 26-48), in those treated with complex surgery it was 57 months (CI 95% 41-73) (p = 0.03).

Conclusions

Major excisional surgery, albeit associated to an increased LOS, allowed in our series, a prolonged survival compared to less aggressive type of surgery. However, percutaneous or “open” BKP techniques have expanded indications for palliative surgery and even patients with lower Tokuhashi scores, may benefit from rapid and sustained pain relief, preservation of neurological function and early mobilization.

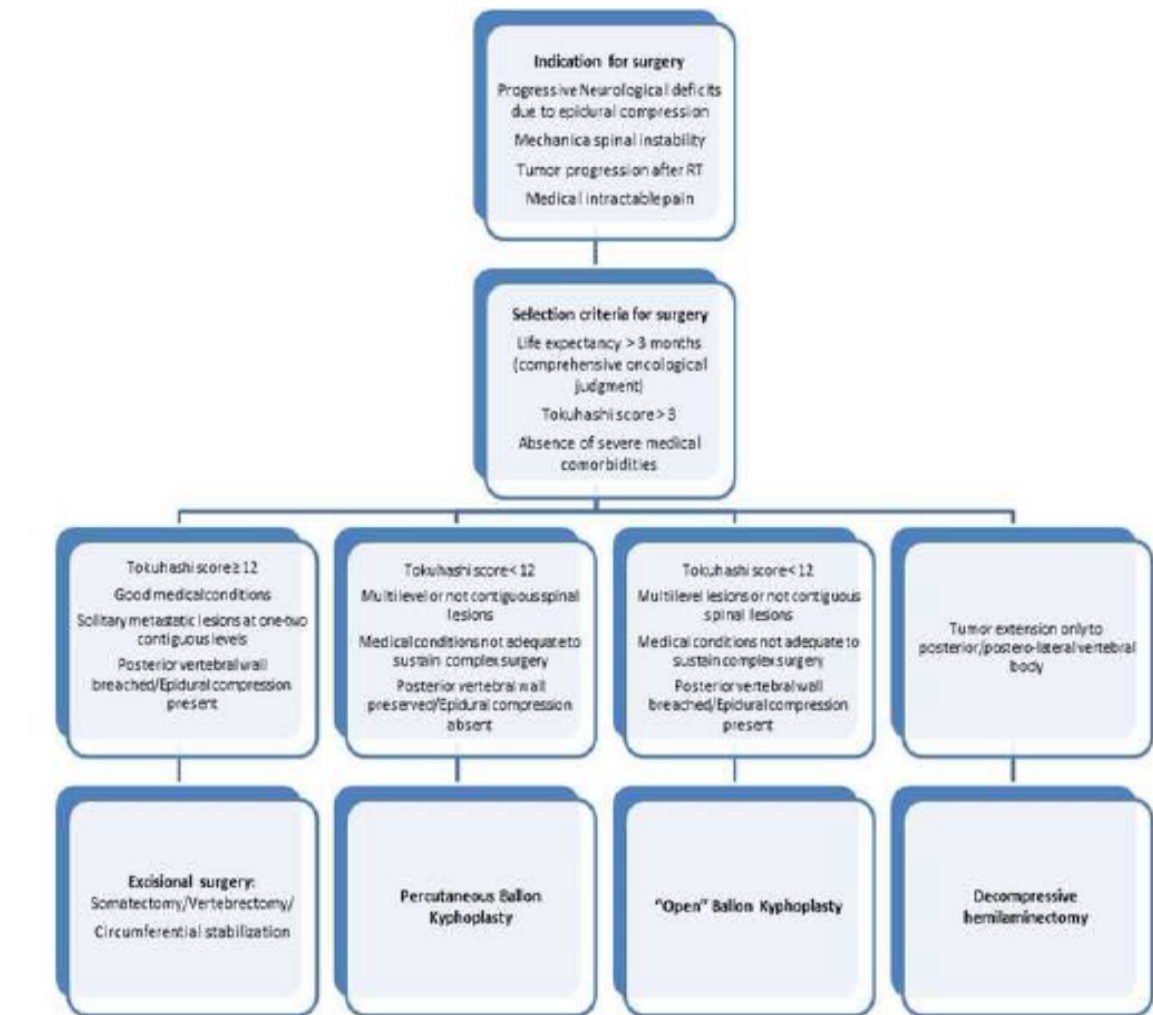
Table 1. Demographic and Clinical Characteristics of 41 Patients with Breast Cancer Who Underwent Surgery for Spinal Metastases

Characteristic	Value
Median age (range) (years)	58 (34–84)
Median follow-up from primary breast diagnosis (range) (months)	168 (110–228)
Median follow-up from first spinal surgery (range) (months)	55 (43–67)
Histology of breast cancer	Ductal infiltrative: 39 (95) Lobular infiltrative: 2 (5)
Receptor status	
ES+	30 (73)
PgR+	29 (71)
HER2+	9 (22)
ES–	11 (27)
PgR–	12 (29)
HER2–	32 (78)
Triple negative ES–PgR–HER2–	7 (17)
Synchronous metastases	5 (12)
Other sites of metastases at time of surgery	Skeletal metastases only: 36 (88) Skeletal and visceral metastases: 5 (12)
Number of vertebral involvement	Only 1: 24 (58) Multiple: 17 (41)
Number of levels surgically treated	57 in 41 patients Only 1: 26 (63) Multiple: 15 (37)
Site of treated vertebrae	
Cervical	4 (7)
Thoracic	35 (61)
Lumbar	18 (32)
Median time between primary breast cancer diagnosis and spine surgery (range) (months)	60 (0–228)
Median SINS score	12
Patient stratification based on Tokuhashi score	
0–8	2 (5)
9–11	17 (41)
12–15	22 (54)
Median SINS score	10 (palliative surgery: 10; excisional surgery: 14)
Preoperative ASA grade	0

Table 1. Continued

Characteristic	Value
B	1 (2)
C	6 (14)
D	14 (34)
E	20 (49)
Palliative surgery	28 (68)
Complex excisional surgery	13 (32)
Metastatic lesion confirmed at diagnosis	33 (80)
Metastatic lesion not confirmed at diagnosis	8 (20)
Median LOS (range) (days)	5 (2–30) (palliative surgery: 3.5 [2–25]; excisional surgery: 10 [5–30])
Median overall survival (months)	114 (95% CI, 78–150)
Median survival after spine surgery (months)	50 (95% CI, 35–65)
Median survival with retained ambulatory capability and KPS score ≥60 (months)	50 (95% CI, 39–61)

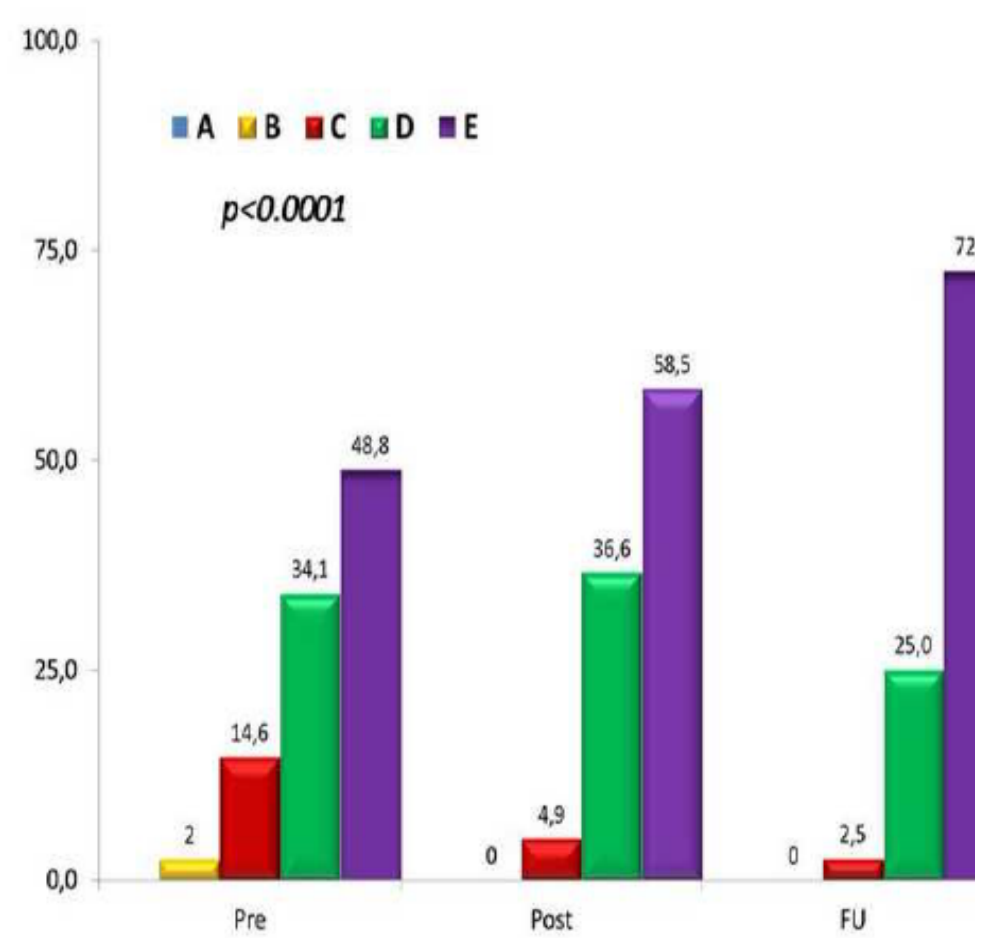
Values are n (%) or as otherwise indicated.
ES, estrogen; PgR, progesterone; HER2, human epidermal growth factor 2 subtype; SINS, Spinal Instability Neoplastic Score; ASA, American Spinal Injury Association; LOS, length of hospital stay; CI, confidence interval; KPS, Karnofsky Performance Status Scale.



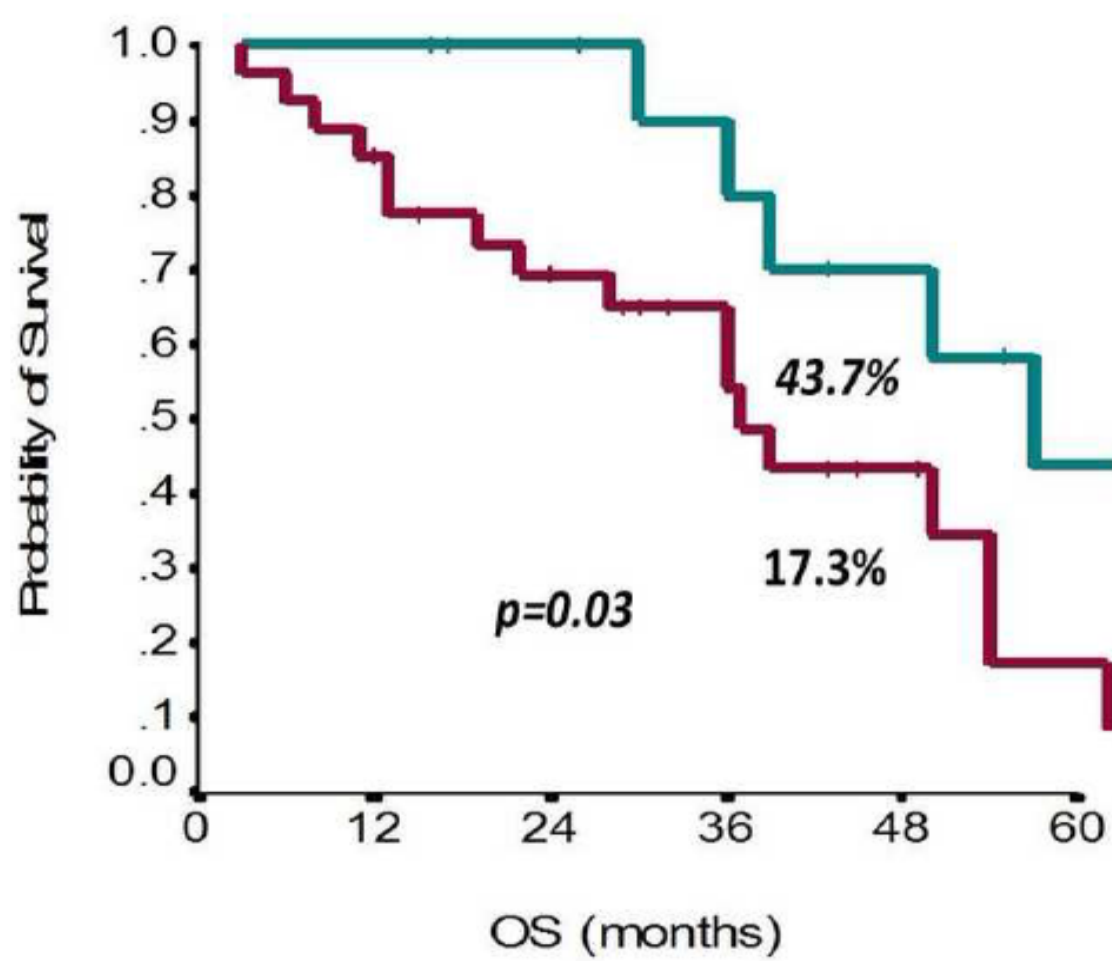
Algorithm for surgical treatment of patients with symptomatic spinal metastases from breast cancer, currently used at “Regina Elena”

Variables		Median (range)	p
VAS	Pre	80 (60-90)	<0.0001
	Post	40 (10-80)	
	FU	30 (0-70)	
KPS	Pre	60 (40-80)	<0.0001
	Post	70 (50-90)	
	FU	75 (50-100)	

Temporal evolution of Karnofsky Performance Status Scale (KPS) and visual analog scale (VAS) scores in 41 patients as evaluated preoperatively, postoperatively, and at the last follow-up (FU).



Temporal evolution of American Spinal Injury Association grades in 41 patients as evaluated preoperatively, postoperatively, and at the last follow-up (FU).



Kaplan-Meier survival curve after the first surgery for spinal metastases (median survival 50 months). (A) Improved survival for patients treated with complex surgery. (B) Shortened survival for patients treated with palliative surgery. OS, overall survival.

