Figure S1 Patient with prostate cancer, 59 years old, with TPSA at 17.9 ng/mL, ALP at 115.8 U/L, and pathological Gleason score 4+3 =7 points. (A) TR-CEUS showed diffuse low enhancement of the prostate. (B) Analysis using the QLAB software in the prostate showed RT of 2.75 s, PI of 7.41 dB, MTT of 11.57 s, AUC of 229.25 dBs, HT of 17.96 s, WIS of 2.41 dB/s, and TTP of 14.94 s. The bone metastasis model had a score of 48 points, a bone metastasis risk of 46%, and a low risk of bone metastases. (C) A whole-bone scan was performed 3 h after intravenous injection of 99mTc-MDP. The scan included front and rear image acquisition. The whole bone scan image was clear and symmetrical, and no suspicion of metastasis was observed. TPSA, total prostate-specific antigen; ALP, alkaline phosphatase; TR-CEUS, Transrectal contrast-enhanced ultrasound; RT, rise time; PI, peak intensity; MTT, mean transit time; AUC, area under the curve; HT, intensity from peak to one-half time; WIS, wash-in slope; TTP, time to peak.
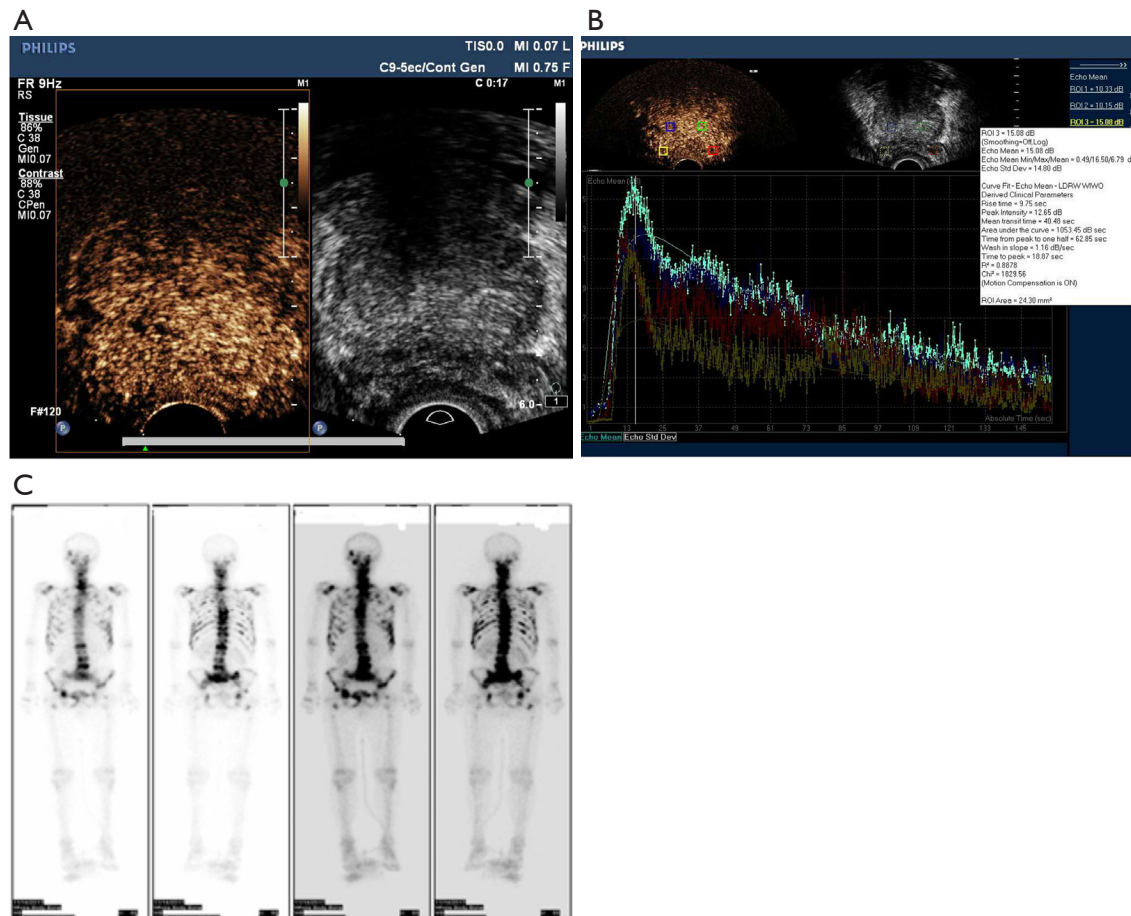
Figure S2 Patient with prostate cancer, 67 years old, with TPSA of 44.74 ng/mL, ALP of 121.7 U/L, and pathological Gleason score 5+5 =10 points. (A) TR-CEUS showed diffuse high enhancement of the prostate. (B) Analysis using the QLAB software in the prostate showed RT of 9.75 s, PI of 12.65 dB, MTT of 40.48 s, AUC of 1,053.45 dBs, HT of 62.85 s, WIS of 1.16 dB/s, and TTP of 18.87 s. The bone metastasis model had a score of 110 points and a bone metastasis risk of >90%. The risk of bone metastasis was high. (C) A whole-bone scan was performed 3 h after intravenous injection of 99mTc-MDP. The scan included front and rear image acquisition. The whole bone scan image was clear, bilaterally symmetrical. There were multiple radioactive abnormalities in the skull base, sternum, bilateral ribs, spine, pelvis, and proximal femur. TPSA, total prostate-specific antigen; ALP, alkaline phosphatase; TR-CEUS, Transrectal contrast-enhanced ultrasound; RT, rise time; PI, peak intensity; MTT, mean transit time; AUC, area under the curve; HT, intensity from peak to one-half time; WIS, wash-in slope; TTP, time to peak.

Table S1 Analysis of bone metastasis in the training and validation sets

Indicators	Training set (n=82)			Validation dataset (n=81)		
	Non-bone metastasis	Bone metastasis	P	Non-bone metastasis	Bone metastasis	P
Age (years)	72.5±7.9	71.7±8.7	0.643	70.4±6.5	73.7±6.7	0.035
Volume (mL)	39.4 (33.2)	51.6 (28.4)	0.077	55.6 (34.5)	47.2 (44.6)	0.084
TPSA (ng/mL)			0.007			0.384
<20	13 (28.3)	1 (2.8)		17 (32.7)	7 (24.1)	
20–30	7 (15.2)	5 (13.9)		11 (21.2)	4 (13.8)	
>30	26 (56.5)	30 (83.3)		24 (46.2)	18 (62.1)	
ALP (U/L)			<0.001			<0.001
<100	38 (82.6)	22 (61.1)		46 (88.5)	10 (34.5)	
100–150	8 (17.4)	3 (8.3)		6 (11.5)	8 (27.6)	
>150	0 (0.0)	11 (30.6)		0 (0.0)	8 (27.6)	
Gleason			0.458			0.130
≤6	8 (17.4)	5 (13.9)		16 (30.8)	3 (10.3)	
3+4	7 (15.2)	5 (13.9)		5 (9.6)	3 (10.3)	
4+3	17 (37.0)	8 (22.2)		14 (26.9)	6 (20.7)	
8	9 (19.6)	11 (30.6)		8 (15.4)	10 (34.5)	
9–10	5 (10.9)	7 (19.4)		9 (17.3)	7 (24.1)	
PI	6.61 (3.59)	7.98 (5.15)	0.024	7.63 (2.59)	7.88 (3.52)	0.347
MTT	25.25 (14.52)	28.15 (10.44)	0.230	25.34 (9.73)	26.06 (17.00)	0.961
HT	37.08 (19.94)	40.99 (16.5)	0.372	36.52 (11.33)	38.37 (23.29)	0.902
WIS	1.3 (0.87)	1.13 (1.18)	0.644	1.46 (0.82)	0.87 (0.73)	0.009
TTP	25.48 (8.91)	24.57 (7.74)	0.667	23.84 (9.32)	25.1 (10.23)	0.879
RT	6.84 (3.27)	6.84 (3.54)	0.837	6.29 (3.13)	7.27 (4.53)	0.157
AUC	390.74 (232.04)	485.61 (423.64)	0.010	404.66 (190.00)	410.67 (285.4)	0.146

Continuous data are presented as mean ± standard deviation or median (interquartile range). Categorical data are shown as n (%). PI, peak intensity; MTT, mean transit time; AUC, area under the curve; HT, intensity from peak to one-half time; WIS, wash-in slope; TTP, time to peak; RT, rise time; TPSA, total prostate-specific antigen; ALP, alkaline phosphatase.

Table S2 ROC curve analysis of individual indicators in the training and validation sets

Variable	Training set (n=115)				Validation dataset (n=48)				All (n=163)				P*
	AUC (95% CI)	Sensitivity	Specificity	Youden	AUC (95% CI)	Sensitivity	Specificity	Youden	AUC (95% CI)	Sensitivity	Specificity	Youden	
PI	0.647 (0.553–0.734)	65.31	60.61	0.259	0.502 (0.354–0.650)	62.50	18.75	0.188	0.606 (0.527–0.682)	26.2	95.9	0.221	<0.001
AUC	0.680 (0.587–0.764)	42.86	98.48	0.413	0.510 (0.361–0.657)	56.25	25.00	0.188	0.636 (0.557–0.710)	36.9	98.0	0.349	<0.001
Gleason	0.609 (0.514–0.699)	51.02	71.21	0.222	0.632 (0.480–0.766)	62.60	62.50	0.250	0.612 (0.533–0.687)	53.9	68.4	0.222	<0.001
ALP	0.672 (0.578–0.757)	30.61	100.00	0.306	0.809 (0.669–0.908)	68.75	87.50	0.563	0.707 (0.630–0.775)	50.8	85.7	0.365	0.006
TPSA	0.620 (0.524–0.709)	75.51	45.45	0.21	0.613 (0.705–0.930)	68.75	56.25	0.250	0.624 (0.545–0.699)	73.9	49.0	0.228	<0.001

*, compared with model. AUC, area under the curve; CI, confidence interval; PI, peak intensity; AUC, area under the curve; ALP, alkaline phosphatase; TPSA, total prostate-specific antigen.