

Abbreviations: BACC: Balanced accuracy; BIO: Biochemical (urinary C-terminal cross-linked telopeptides of type II collagen, crosslinked N-telopeptide of type I collagen serum, and Hyaluronic Acid serum) parameters; CLIN: clinical (age, sex, body mass index) covariates; JSNM: Joint space narrowing score in the medial tibial plateau; KL: Kellgren-Lawrence score; NPV: Negative predictive value; PPV: Positive predictive value; TBT: Trabecular bone texture; TBTC: Trabecular bone texture parameters extracted from the central compartment; TBTL: Trabecular bone texture parameters extracted from the lateral compartment; TBTM: Trabecular bone texture parameters extracted from the medial compartment.

Table S1: Primary analysis: Prediction of radio-symptomatic progression using TBT descriptors adjusted for a set of clinical, radiographic and/or biochemical parameters.

Model	BACC	PPV	NPV	AUC (95%CI)	p-value
TBT \leftarrow CLIN+KL+JSNM*	0.55	0.50	0.70	0.613 (0.565 - 0.662)	-
Δ TBT \leftarrow CLIN+KL+JSNM	0.53	0.45	0.70	0.606 (0.558 - 0.653)	0.777
TBT+ Δ TBT \leftarrow CLIN+KL+JSNM	0.59	0.52	0.73	0.650 (0.603 - 0.697)	0.044
TBT	0.55	0.53	0.70	0.609 (0.561 - 0.657)	0.697
TBT \leftarrow BIO	0.55	0.50	0.70	0.617 (0.569 - 0.665)	0.630
TBT \leftarrow BIO+CLIN	0.55	0.49	0.70	0.609 (0.561 - 0.658)	0.574
TBT \leftarrow BIO+KL	0.55	0.51	0.70	0.615 (0.566 - 0.663)	0.859
TBT \leftarrow BIO+JSNM	0.56	0.52	0.71	0.622 (0.574 - 0.671)	0.022
TBT \leftarrow BIO+CLIN+KL	0.55	0.49	0.70	0.607 (0.558 - 0.656)	0.856
TBT \leftarrow BIO+CLIN+JSNM	0.55	0.50	0.71	0.614 (0.566 - 0.663)	0.320
TBT \leftarrow BIO+CLIN+KL+JSNM	0.55	0.49	0.70	0.613 (0.565 - 0.661)	0.287
Δ TBT	0.52	0.40	0.69	0.610 (0.562 - 0.658)	0.921
TBT+ Δ TBT	0.58	0.51	0.72	0.658 (0.612 - 0.705)	0.030
TBT+ Δ TBT \leftarrow BIO	0.59	0.52	0.73	0.658 (0.611 - 0.704)	0.022
TBT+ Δ TBT \leftarrow CLIN	0.58	0.51	0.72	0.656 (0.609 - 0.702)	0.038
TBT+ Δ TBT \leftarrow KL	0.58	0.51	0.72	0.658 (0.611 - 0.704)	0.029
TBT+ Δ TBT \leftarrow JSNM	0.58	0.51	0.72	0.658 (0.612 - 0.705)	0.024
TBT+ Δ TBT \leftarrow BIO+CLIN	0.59	0.52	0.73	0.653 (0.607 - 0.700)	0.036
TBT+ Δ TBT \leftarrow BIO+KL	0.59	0.52	0.72	0.656 (0.609 - 0.702)	0.026
TBT+ Δ TBT \leftarrow BIO+JSNM	0.59	0.52	0.73	0.656 (0.609 - 0.702)	0.021
TBT+ Δ TBT \leftarrow BIO+CLIN+ KL	0.59	0.52	0.73	0.653 (0.606 - 0.699)	0.036
TBT+ Δ TBT \leftarrow BIO+CLIN+JSNM	0.59	0.52	0.73	0.652 (0.605 - 0.699)	0.039
TBT+ Δ TBT \leftarrow BIO+CLIN+KL+JSNM	0.59	0.52	0.73	0.649 (0.601 - 0.696)	0.054
TBTM \leftarrow CLIN+KL+JSNM	0.51	0.42	0.68	0.571 (0.522 - 0.620)	0.062
Δ TBTM \leftarrow CLIN+KL+JSNM	0.51	0.54	0.68	0.563 (0.513 - 0.612)	0.075
TBTM+ Δ TBTM \leftarrow CLIN+KL+JSNM	0.53	0.52	0.69	0.594 (0.545 - 0.643)	0.456
TBTL \leftarrow CLIN+KL+JSNM	0.50	0.22	0.68	0.562 (0.514 - 0.610)	0.029
Δ TBTL \leftarrow CLIN+KL+JSNM	0.50	0.38	0.68	0.555 (0.505 - 0.605)	0.026
TBTL+ Δ TBTL \leftarrow CLIN+KL+JSNM	0.51	0.46	0.68	0.577 (0.527 - 0.627)	0.173
TBTC \leftarrow CLIN+KL+JSNM	0.50	NaN	0.68	0.511 (0.461 - 0.560)	0.000
Δ TBTC \leftarrow CLIN+KL+JSNM	0.51	0.47	0.68	0.572 (0.525 - 0.620)	0.134
TBTC+ Δ TBTC \leftarrow CLIN+KL+JSNM	0.51	0.46	0.68	0.572 (0.524 - 0.620)	0.131

* refers to the reference model. The model with the descriptor on the left of (\leftarrow) is adjusted for the descriptor(s) on the right of (\leftarrow). The highest BACC, PPV, NPV and AUC values obtained are in bold.

Table S2: Secondary analysis: Prediction of any progression using TBT descriptors adjusted for a set of clinical, radiographic and/or biochemical parameters.

Model	BACC	PPV	NPV	AUC (95%CI)	p-value
TBT \leftarrow CLIN+KL+JSNM*	0.55	0.69	0.46	0.628 (0.582 - 0.675)	-
Δ TBT \leftarrow CLIN+KL+JSNM	0.56	0.70	0.51	0.638 (0.592 - 0.685)	0.697
TBT+ Δ TBT \leftarrow CLIN+KL+JSNM	0.60	0.72	0.52	0.679 (0.634 - 0.724)	0.009
TBT	0.53	0.68	0.44	0.615 (0.568 - 0.662)	0.377
TBT \leftarrow BIO	0.54	0.69	0.48	0.624 (0.577 - 0.671)	0.734
TBT \leftarrow BIO+CLIN	0.54	0.69	0.48	0.617 (0.569 - 0.665)	0.303
TBT \leftarrow BIO+KL	0.54	0.69	0.48	0.620 (0.573 - 0.667)	0.505
TBT \leftarrow BIO+JSNM	0.54	0.68	0.46	0.626 (0.580 - 0.673)	0.904
TBT \leftarrow BIO+CLIN+KL	0.54	0.69	0.47	0.614 (0.566 - 0.661)	0.437
TBT \leftarrow BIO+CLIN+JSNM	0.55	0.69	0.48	0.622 (0.575 - 0.669)	0.173
TBT \leftarrow BIO+CLIN+KL+JSNM	0.55	0.69	0.46	0.629 (0.582 - 0.675)	0.025
Δ TBT	0.56	0.69	0.56	0.615 (0.568 - 0.662)	0.680
TBT+ Δ TBT	0.58	0.71	0.52	0.672 (0.627 - 0.717)	0.075
TBT+ Δ TBT \leftarrow BIO	0.59	0.72	0.53	0.676 (0.631 - 0.721)	0.033
TBT+ Δ TBT \leftarrow CLIN	0.59	0.72	0.52	0.672 (0.627 - 0.717)	0.062
TBT+ Δ TBT \leftarrow KL	0.58	0.71	0.52	0.669 (0.624 - 0.714)	0.100
TBT+ Δ TBT \leftarrow JSNM	0.58	0.71	0.52	0.675 (0.630 - 0.720)	0.051
TBT+ Δ TBT \leftarrow BIO+CLIN	0.59	0.72	0.52	0.674 (0.629 - 0.719)	0.030
TBT+ Δ TBT \leftarrow BIO+KL	0.59	0.71	0.52	0.673 (0.628 - 0.718)	0.046
TBT+ Δ TBT \leftarrow BIO+JSNM	0.59	0.72	0.53	0.676 (0.631 - 0.721)	0.026
TBT+ Δ TBT \leftarrow BIO+CLIN+ KL	0.59	0.72	0.52	0.671 (0.626 - 0.716)	0.023
TBT+ Δ TBT \leftarrow BIO+CLIN+JSNM	0.59	0.72	0.52	0.675 (0.630 - 0.720)	0.045
TBT+ Δ TBT \leftarrow BIO+CLIN+KL+JSNM	0.60	0.72	0.52	0.678 (0.633 - 0.723)	0.011
TBTM \leftarrow CLIN+KL+JSNM	0.51	0.67	0.40	0.589 (0.542 - 0.637)	0.057
Δ TBTM \leftarrow CLIN+KL+JSNM	0.51	0.67	0.50	0.567 (0.518 - 0.616)	0.025
TBTM+ Δ TBTM \leftarrow CLIN+KL+JSNM	0.52	0.68	0.44	0.614 (0.567 - 0.661)	0.537
TBTL \leftarrow CLIN+KL+JSNM	0.51	0.67	0.44	0.566 (0.518 - 0.615)	0.019
Δ TBTL \leftarrow CLIN+KL+JSNM	0.51	0.67	0.45	0.590 (0.542 - 0.639)	0.160
TBTL+ Δ TBTL \leftarrow CLIN+KL+JSNM	0.53	0.68	0.52	0.596 (0.547 - 0.645)	0.249
TBTC \leftarrow CLIN+KL+JSNM	0.51	0.67	0.44	0.570 (0.522 - 0.619)	0.022
Δ TBTC \leftarrow CLIN+KL+JSNM	0.51	0.67	0.50	0.572 (0.522 - 0.622)	0.045
TBTC+ Δ TBTC \leftarrow CLIN+KL+JSNM	0.52	0.67	0.52	0.580 (0.531 - 0.629)	0.062

* refers to the reference model. The model with the descriptor on the left of (\leftarrow) is adjusted for the descriptor(s) on the right of (\leftarrow). The highest BACC, PPV, NPV and AUC values obtained are in bold.

Table S3: Secondary analysis: Prediction of all progression using TBT descriptors adjusted for a set of clinical, radiographic and/or biochemical parameters.

Model	BACC	PPV	NPV	AUC (95%CI)	p-value
TBT \leftarrow CLIN+KL+JSNM*	0.59	0.59	0.58	0.628 (0.574 - 0.682)	-
Δ TBT \leftarrow CLIN+KL+JSNM	0.58	0.58	0.57	0.628 (0.574 - 0.682)	0.996
TBT+ Δ TBT \leftarrow CLIN+KL+JSNM	0.63	0.64	0.63	0.684 (0.632 - 0.736)	0.022
TBT	0.58	0.59	0.57	0.621 (0.566 - 0.675)	0.668
TBT \leftarrow BIO	0.59	0.60	0.58	0.632 (0.578 - 0.686)	0.690
TBT \leftarrow BIO+CLIN	0.59	0.60	0.58	0.629 (0.575 - 0.684)	0.818
TBT \leftarrow BIO+KL	0.59	0.59	0.58	0.629 (0.575 - 0.683)	0.877
TBT \leftarrow BIO+JSNM	0.59	0.59	0.58	0.629 (0.575 - 0.683)	0.891
TBT \leftarrow BIO+CLIN+KL	0.59	0.59	0.58	0.628 (0.574 - 0.683)	0.755
TBT \leftarrow BIO+CLIN+JSNM	0.59	0.59	0.58	0.624 (0.570 - 0.678)	0.901
TBT \leftarrow BIO+CLIN+KL+JSNM	0.58	0.59	0.58	0.627 (0.574 - 0.681)	0.614
Δ TBT	0.59	0.59	0.58	0.628 (0.574 - 0.682)	0.988
TBT+ Δ TBT	0.64	0.64	0.63	0.685 (0.633 - 0.736)	0.047
TBT+ Δ TBT \leftarrow BIO	0.64	0.64	0.63	0.691 (0.639 - 0.742)	0.018
TBT+ Δ TBT \leftarrow CLIN	0.63	0.63	0.62	0.678 (0.626 - 0.730)	0.066
TBT+ Δ TBT \leftarrow KL	0.63	0.64	0.63	0.680 (0.628 - 0.732)	0.068
TBT+ Δ TBT \leftarrow JSNM	0.63	0.64	0.63	0.682 (0.631 - 0.734)	0.050
TBT+ Δ TBT \leftarrow BIO+CLIN	0.63	0.64	0.63	0.683 (0.631 - 0.734)	0.037
TBT+ Δ TBT \leftarrow BIO+KL	0.63	0.64	0.63	0.688 (0.637 - 0.740)	0.025
TBT+ Δ TBT \leftarrow BIO+JSNM	0.64	0.65	0.64	0.688 (0.637 - 0.740)	0.022
TBT+ Δ TBT \leftarrow BIO+CLIN+ KL	0.63	0.63	0.62	0.680 (0.628 - 0.732)	0.042
TBT+ Δ TBT \leftarrow BIO+CLIN+JSNM	0.63	0.64	0.63	0.681 (0.629 - 0.733)	0.046
TBT+ Δ TBT \leftarrow BIO+CLIN+KL+JSNM	0.63	0.64	0.62	0.684 (0.632 - 0.735)	0.023
TBTM \leftarrow CLIN+KL+JSNM	0.53	0.53	0.52	0.553 (0.497 - 0.609)	0.007
Δ TBTM \leftarrow CLIN+KL+JSNM	0.53	0.53	0.52	0.538 (0.482 - 0.594)	0.005
TBTM+ Δ TBTM \leftarrow CLIN+KL+JSNM	0.53	0.53	0.52	0.570 (0.514 - 0.625)	0.062
TBTL \leftarrow CLIN+KL+JSNM	0.55	0.55	0.55	0.566 (0.510 - 0.622)	0.035
Δ TBTL \leftarrow CLIN+KL+JSNM	0.55	0.55	0.54	0.570 (0.514 - 0.626)	0.060
TBTL+ Δ TBTL \leftarrow CLIN+KL+JSNM	0.55	0.55	0.55	0.588 (0.533 - 0.644)	0.191
TBTC \leftarrow CLIN+KL+JSNM	0.53	0.54	0.53	0.559 (0.504 - 0.615)	0.028
Δ TBTC \leftarrow CLIN+KL+JSNM	0.55	0.56	0.55	0.574 (0.518 - 0.630)	0.102
TBTC+ Δ TBTC \leftarrow CLIN+KL+JSNM	0.55	0.55	0.54	0.572 (0.517 - 0.628)	0.083

* refers to the reference model. The model with the descriptor on the left of (\leftarrow) is adjusted for the descriptor(s) on the right of (\leftarrow). The highest BACC, PPV, NPV and AUC values obtained are in bold.

Table S4: Secondary analysis: Prediction of radiographic progression using TBT descriptors adjusted for a set of clinical, radiographic and/or biochemical parameters.

Model	BACC	PPV	NPV	AUC (95%CI)	p-value
TBT \leftarrow CLIN+KL+JSNM*	0.57	0.45	0.78	0.709 (0.653 - 0.765)	-
Δ TBT \leftarrow CLIN+KL+JSNM	0.60	0.50	0.79	0.742 (0.688 - 0.795)	0.332
TBT+ Δ TBT \leftarrow CLIN+KL+JSNM	0.65	0.51	0.82	0.779 (0.731 - 0.827)	0.012
TBT	0.56	0.50	0.77	0.652 (0.591 - 0.713)	0.005
TBT \leftarrow BIO	0.55	0.44	0.77	0.650 (0.590 - 0.711)	0.003
TBT \leftarrow BIO+CLIN	0.57	0.46	0.78	0.699 (0.641 - 0.757)	0.319
TBT \leftarrow BIO+KL	0.55	0.45	0.77	0.644 (0.583 - 0.705)	0.001
TBT \leftarrow BIO+JSNM	0.56	0.46	0.77	0.664 (0.605 - 0.723)	0.009
TBT \leftarrow BIO+CLIN+KL	0.57	0.46	0.78	0.694 (0.635 - 0.752)	0.352
TBT \leftarrow BIO+CLIN+JSNM	0.58	0.47	0.78	0.702 (0.645 - 0.759)	0.136
TBT \leftarrow BIO+CLIN+KL+JSNM	0.57	0.45	0.78	0.708 (0.652 - 0.764)	0.198
Δ TBT	0.56	0.52	0.77	0.671 (0.612 - 0.731)	0.374
TBT+ Δ TBT	0.63	0.49	0.81	0.752 (0.700 - 0.804)	0.191
TBT+ Δ TBT \leftarrow BIO	0.63	0.49	0.81	0.759 (0.707 - 0.810)	0.131
TBT+ Δ TBT \leftarrow CLIN	0.65	0.51	0.82	0.773 (0.724 - 0.822)	0.025
TBT+ Δ TBT \leftarrow KL	0.63	0.48	0.81	0.749 (0.697 - 0.801)	0.230
TBT+ Δ TBT \leftarrow JSNM	0.64	0.49	0.81	0.753 (0.702 - 0.805)	0.172
TBT+ Δ TBT \leftarrow BIO+CLIN	0.66	0.52	0.82	0.783 (0.736 - 0.831)	0.009
TBT+ Δ TBT \leftarrow BIO+KL	0.63	0.48	0.81	0.754 (0.703 - 0.806)	0.171
TBT+ Δ TBT \leftarrow BIO+JSNM	0.63	0.49	0.81	0.760 (0.709 - 0.811)	0.116
TBT+ Δ TBT \leftarrow BIO+CLIN+ KL	0.65	0.51	0.82	0.779 (0.731 - 0.828)	0.012
TBT+ Δ TBT \leftarrow BIO+CLIN+JSNM	0.65	0.51	0.82	0.781 (0.733 - 0.829)	0.014
TBT+ Δ TBT \leftarrow BIO+CLIN+KL+JSNM	0.65	0.51	0.82	0.779 (0.731 - 0.828)	0.011
TBTM \leftarrow CLIN+KL+JSNM	0.52	0.39	0.76	0.654 (0.594 - 0.713)	0.038
Δ TBTM \leftarrow CLIN+KL+JSNM	0.53	0.44	0.76	0.678 (0.616 - 0.739)	0.368
TBTM+ Δ TBTM \leftarrow CLIN+KL+JSNM	0.56	0.52	0.77	0.683 (0.623 - 0.742)	0.423
TBTL \leftarrow CLIN+KL+JSNM	0.52	0.43	0.76	0.653 (0.589 - 0.716)	0.022
Δ TBTL \leftarrow CLIN+KL+JSNM	0.53	0.42	0.76	0.678 (0.618 - 0.738)	0.325
TBTL+ Δ TBTL \leftarrow CLIN+KL+JSNM	0.55	0.50	0.77	0.676 (0.615 - 0.736)	0.256
TBTC \leftarrow CLIN+KL+JSNM	0.51	0.35	0.75	0.652 (0.590 - 0.713)	0.032
Δ TBTC \leftarrow CLIN+KL+JSNM	0.52	0.46	0.75	0.647 (0.588 - 0.706)	0.041
TBTC+ Δ TBTC \leftarrow CLIN+KL+JSNM	0.52	0.38	0.76	0.653 (0.595 - 0.712)	0.034

* refers to the reference model. The model with the descriptor on the left of (\leftarrow) is adjusted for the descriptor(s) on the right of (\leftarrow). The highest BACC, PPV, NPV and AUC values obtained are in bold.

Table S5: Secondary analysis: Prediction of symptomatic progression using TBT descriptors adjusted for a set of clinical, radiographic and/or biochemical parameters.

Model	BACC	PPV	NPV	AUC (95%CI)	p-value
TBT \leftarrow CLIN+KL+JSNM*	0.53	0.40	0.76	0.643 (0.583 - 0.703)	-
Δ TBT \leftarrow CLIN+KL+JSNM	0.53	0.39	0.76	0.661 (0.602 - 0.720)	0.615
TBT+ Δ TBT \leftarrow CLIN+KL+JSNM	0.60	0.49	0.79	0.710 (0.654 - 0.766)	0.027
TBT	0.51	0.31	0.75	0.620 (0.560 - 0.679)	0.276
TBT \leftarrow BIO	0.52	0.35	0.75	0.629 (0.568 - 0.690)	0.454
TBT \leftarrow BIO+CLIN	0.53	0.42	0.76	0.651 (0.591 - 0.711)	0.110
TBT \leftarrow BIO+KL	0.52	0.35	0.75	0.636 (0.576 - 0.696)	0.670
TBT \leftarrow BIO+JSNM	0.52	0.36	0.75	0.631 (0.571 - 0.692)	0.487
TBT \leftarrow BIO+CLIN+KL	0.53	0.41	0.76	0.649 (0.589 - 0.708)	0.475
TBT \leftarrow BIO+CLIN+JSNM	0.53	0.42	0.76	0.646 (0.587 - 0.706)	0.030
TBT \leftarrow BIO+CLIN+KL+JSNM	0.53	0.40	0.76	0.645 (0.586 - 0.705)	0.027
Δ TBT	0.51	0.33	0.75	0.626 (0.567 - 0.686)	0.701
TBT+ Δ TBT	0.59	0.50	0.78	0.698 (0.641 - 0.756)	0.132
TBT+ Δ TBT \leftarrow BIO	0.60	0.52	0.79	0.699 (0.641 - 0.758)	0.106
TBT+ Δ TBT \leftarrow CLIN	0.59	0.49	0.79	0.711 (0.655 - 0.766)	0.044
TBT+ Δ TBT \leftarrow KL	0.59	0.49	0.78	0.696 (0.638 - 0.754)	0.144
TBT+ Δ TBT \leftarrow JSNM	0.59	0.49	0.78	0.697 (0.639 - 0.754)	0.142
TBT+ Δ TBT \leftarrow BIO+CLIN	0.61	0.51	0.79	0.718 (0.662 - 0.774)	0.013
TBT+ Δ TBT \leftarrow BIO+KL	0.60	0.51	0.79	0.700 (0.642 - 0.758)	0.094
TBT+ Δ TBT \leftarrow BIO+JSNM	0.59	0.50	0.79	0.700 (0.642 - 0.758)	0.095
TBT+ Δ TBT \leftarrow BIO+CLIN+ KL	0.60	0.50	0.79	0.713 (0.657 - 0.769)	0.016
TBT+ Δ TBT \leftarrow BIO+CLIN+JSNM	0.60	0.50	0.79	0.715 (0.660 - 0.771)	0.019
TBT+ Δ TBT \leftarrow BIO+CLIN+KL+JSNM	0.60	0.49	0.79	0.710 (0.654 - 0.766)	0.027
TBTM \leftarrow CLIN+KL+JSNM	0.50	0.07	0.75	0.566 (0.503 - 0.630)	0.018
Δ TBTM \leftarrow CLIN+KL+JSNM	0.50	0.13	0.74	0.601 (0.538 - 0.664)	0.230
TBTM+ Δ TBTM \leftarrow CLIN+KL+JSNM	0.50	0.31	0.75	0.618 (0.557 - 0.679)	0.463
TBTL \leftarrow CLIN+KL+JSNM	0.51	0.37	0.75	0.594 (0.533 - 0.655)	0.088
Δ TBTL \leftarrow CLIN+KL+JSNM	0.50	0.01	0.74	0.584 (0.519 - 0.649)	0.096
TBTL+ Δ TBTL \leftarrow CLIN+KL+JSNM	0.50	0.27	0.75	0.618 (0.558 - 0.678)	0.427
TBTC \leftarrow CLIN+KL+JSNM	0.51	0.54	0.75	0.570 (0.505 - 0.634)	0.006
Δ TBTC \leftarrow CLIN+KL+JSNM	0.50	0.22	0.75	0.571 (0.509 - 0.633)	0.041
TBTC+ Δ TBTC \leftarrow CLIN+KL+JSNM	0.52	0.49	0.75	0.588 (0.526 - 0.650)	0.055

* refers to the reference model. The model with the descriptor on the left of (\leftarrow) is adjusted for the descriptor(s) on the right of (\leftarrow). The highest BACC, PPV, NPV and AUC values obtained are in bold.