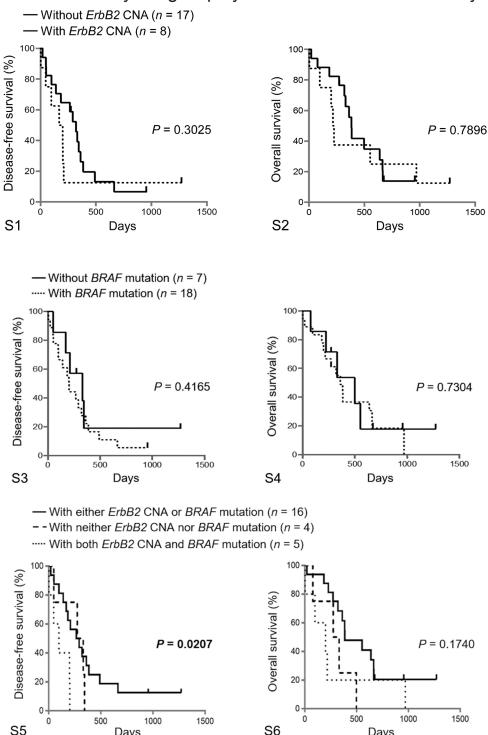
Veterinary Pathology: Supplemental Materials.

Sakai et al. ErbB2 copy number aberration in canine urothelial carcinoma detected by a digital polymerase chain reaction assay.



Supplemental Figures S1-S6. Kaplan-Meier curves of disease-free survival and overall survival in dogs with urothelial carcinoma (UC) based on ErbB2 copy number aberration (CNA) (Figs. S1 and S2), BRAF mutation (Figs. S3 and S4), and combination of ErbB2 CNA with BRAF mutation (Figs. S5 and S6). For the survival analyses, 25 UC cases with total cystectomy were used. These cases included 5 cases with both ErbB2 CNA and BRAF mutation, 3 cases with only ErbB2 CNA, 13 cases with only BRAF mutation, and 4 cases with neither ErbB2 CNA nor BRAF mutation. Black symbols indicate censored cases.

ase	Age	Sex	Neutered status	Breed	BRAF mutation	ErbB2:CFA8 ratio	ErbB2 CNA	IHC for ErbB2	т	N	м	Operative procedure	Living status	Cause of death	DFS	os	Therapy before surgery	Therapy after surgery
IC 1	12y5m	Female	Spayed	Miniature Dachshund	+	0.64	-	+	1	1	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	490	666	No treatment	Piroxicam
IC 2	12y1m	Male	Intact	French Bulldog	-	0.48	-	Unknown	2	0	0	Partial cystectomy	Dead	Progression of tumor	322	322	No treatment	Piroxicam
IC 3	10y3m	Female	Spayed	Shih Tzu	-	0.73	-	Unknown	2	0	0	Partial cystectomy	Alive	-	545	545	Piroxicam	Piroxicam
IC 4	10y2m	Female	Spayed	Mixed	-	0.51	-	Unknown	2	0	0	Biopsy only	Alive	-	-	456	Firocoxib	Piroxicam
C 5	9y4m	Female	Intact	Scottish Terrier	+	0.78	-	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Alive	-	139	272	Piroxicam	Piroxicam
C 6	10y2m	Female	Spayed	Papillon	+	0.47	-	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	665	665	Firocoxib	Firocoxib
C 7	7y1m	Female	Intact	Miniature Dachshund	+	0.93	-	+	3	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	184	184	No treatment	Cyclophosphamide, Carprofe
8 3	10y1m	Female	Intact	Border Collie	-	0.60	-	Unknown	2	0	0	Biopsy only	Dead	Progression of tumor	-	48	Piroxicam	Piroxicam
C 9	13y6m	Female	Spayed	Miniature Dachshund	+	0.91	-	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	320	320	No treatment	No treatment
C 10	8y9m	Female	Intact	French Bulldog	+	0.95	-	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	20	20	No treatment	Carprofen
C 11	13y5m	Male	Intact	Pembroke Welsh Corgi	-	0.67	-	+	3	1	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	274	274	Piroxicam	No treatment
C 12	12y2m	Female	Intact	Wire Fox Terrier	-	0.72	-	-	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	331	331	Piroxicam	Chlorambucil, Piroxicam
13	12y5m	Female	Spayed	Miniature Dachshund	+	0.62	-	Unknown	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	265	272	Piroxicam	Piroxicam
14	11y4m	Female	Spayed	Toy Poodle	-	0.91	-	Unknown	2	1	0	Biopsy only	Unknown	-	-	Unknown	Piroxicam	Piroxicam
15	11y0m	Female	Intact	Papillon	-	0.99	-	-	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	344	498	Cyclophosphamide, Carprofen	Cyclophosphamide, Carpro
16	14y7m	Female	Castrated	Papillon	+	0.96	-	+	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	99	638	Piroxicam	Piroxicam
17	10y10m	Male	Intact	Maltese	+	0.94	-	+	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Alive	-	955	955	No treatment	Piroxicam
18	6y11m	Female	Spayed	Pembroke Welsh Corgi	-	0.94	-	-	3	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	49	77	No treatment	Carprofen
19	11y4m	Female	Spayed	Chihuahua	+	0.88	-	-	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	361	361	No treatment	Cyclophosphamide, Carpro
20	12y11m	Female	Spayed	Papillon	+	0.97	-	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Alive	-	51	675	No treatment	Piroxicam
21	12y8m	Female	Intact	Miniature Dachshund	+	1.50	+	+	2	1	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	98	98	No treatment	Meloxicam
22	12y1m	Male	Intact	Yorkshire Terrier	-	1.51	+	-	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	209	552	Piroxicam	Piroxicam
23	12y0m	Female	Spayed	Yorkshire Terrier	+	1.01	+	Unknown	2	0	0	Biopsy only	Alive	-	-	237	Piroxicam	Piroxicam
24	10y11m	Female	Spayed	Beagle	+	0.94	-	+	3	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	291	384	No treatment	Piroxicam
25	11y6m	Female	Castrated	Pembroke Welsh Corgi	-	1.46	+	-	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Alive	-	1271	1271	Piroxicam	Piroxicam
26	11y4m	Female	Intact	Shetland Sheepdog	+	1.48	+	Unknown	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Perioperative death	3	3	Piroxicam	No treatment
27	13y1m	Female	Spayed	West Highland White terrier	+	1.24	+	-	1	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	202	970	Piroxicam	Mitoxantrone, Meroxicam
28	13y3m	Female	Intact	Shiba Inu	+	3.37	+	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	48	216	Piroxicam	Cisplatin, Piroxicam
29	11y7m	Female	Intact	Miniature Pinscher	+	0.84	-	-	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	386	386	No treatment	No treatment
30	11y8m	Female	Intact	Mixed	+	1.14	+	+	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Renal failure	200	200	Piroxicam	Piroxicam
31	13y8m	Female	Intact	Maltese	+	1.03	+	Unknown	2	0	0	Biopsy only	Alive	-	-	603	Piroxicam	Piroxicam
32	13y4m	Female	Spayed	Labrador Retriever	-	1.45	+	Unknown	2	0	0	Total cystectomy and subsequent urinary diversion to the prepuce or vagina	Dead	Progression of tumor	168	226	No treatment	Piroxicam
33	13y6m	Female	Intact	Shih Tzu	_	0.82		Unknown	2	0	0	Partial cystectomy	Dead	Renal failure	787	787	Piroxicam	Piroxicam
34	8y2m	Male	Intact	French Bulldog	+	1.00		Unknown	2	0	0	Partial cystectomy	Dead	Renal failure	1236	1236	Piroxicam	Piroxicam
35	14y2m	Male	Intact	Pembroke Welsh Corgi	+	1.45	+	Unknown	2	1	0	Partial cystectomy	Dead	Progression of tumor	80	312	No treatment	Piroxicam
C 36	6y5m	Female	Spayed	Mixed	_	1.22	+	Unknown	2	0	0	Partial cystectomy	Dead	Renal failure	1139	1139	Piroxicam	Piroxicam

Table 1. Continued on the next page.

Table S1 (continued). Profiles of the dogs from which formalin-fixed paraffin-embedded urinary bladder tissues were obtained.

Case	Age	Sex	Neutered status	Breed	BRAF mutation	ErbB2:CFA8 ratio	ErbB2 CNA	IHC for ErbB2
Polypoid cystitis 1	10y5m	Male	Intact	Toy Poodle	-	0.43	-	+
Polypoid cystitis 2	9y11m	Female	Spayed	Mixed	-	0.48	-	+
Polypoid cystitis 3	10y4m	Female	Intact	Mixed	-	0.97	-	+
Polypoid cystitis 4	10y3m	Male	Castrated	Beagle	-	0.95	-	-
Polypoid cystitis 5	7y1m	Male	Intact	Miniature Pinscher	-	0.92	-	-
Polypoid cystitis 6	11y4m	Female	Intact	Shih Tzu	-	0.98	-	-
Polypoid cystitis 7	8y5m	Male	Intact	Cavalier King Charles Spaniel	-	1.02	+	-
Polypoid cystitis 8	10y5m	Male	Intact	Shetland Sheepdog	-	1.21	+	-
Normal urinary bladder 1	11y0m	Male	Intact	Beagle	-	0.65	-	-
Normal urinary bladder 2	11y0m	Male	Intact	Beagle	-	0.68	-	-
Normal urinary bladder 3	11y0m	Male	Intact	Beagle	-	0.70	_	-
Normal urinary bladder 4	11y0m	Male	Intact	Beagle	-	0.70	_	-
Normal urinary bladder 5	10y0m	Male	Intact	Beagle	-	0.60	_	-
Normal urinary bladder 6	10y0m	Male	Intact	Beagle	-	0.52	-	-
Normal urinary bladder 7	10y0m	Male	Intact	Beagle	-	0.57	_	-
Normal urinary bladder 8	10y0m	Male	Intact	Beagle	_	0.57	_	_
Normal urinary bladder 9	11y0m	Male	Intact	Beagle	_	0.76	_	Unknown
Normal urinary bladder 10	10y0m	Male	Intact	Beagle	_	0.62	_	Unknown
Normal urinary bladder 11	10y0m	Male	Intact	Beagle	_	0.80	_	Unknown
Normal urinary bladder 12	•	Male	Intact	Beagle	_	0.64	_	Unknown
Normal urinary bladder 13	•	Female	Spayed	Golden retriever	_	0.62	_	Unknown
Normal urinary bladder 14	•	Male	Castrated	Papillon	_	0.66	_	Unknown
Normal urinary bladder 15	•	Male	Intact	Shetland Sheepdog		0.76	_	Unknown
•	•			• •	-		-	Unknown
Normal urinary bladder 16	•	Female	Spayed	Toy Poodle	-	0.65	-	
Normal urinary bladder 17	•	Female	Spayed	Mixed	-	0.76	-	Unknown
Normal urinary bladder 18	•	Male	Castrated	Mixed	-	0.63	-	Unknown
Normal urinary bladder 19	•	Male	Castrated	Beagle	-	0.79	-	Unknown
Normal urinary bladder 20	•	Female	Spayed	Miniature Dachshund	-	0.54	-	Unknown
Normal urinary bladder 21	•	Female	Spayed	Miniature Dachshund	-	0.73	-	Unknown
Normal urinary bladder 22	•	Male	Castrated	Flat-Coated Retriever	-	0.78	-	Unknown
Normal urinary bladder 23	•	Female	Spayed	Mixed	-	0.89	-	Unknown
Normal urinary bladder 24	•	Male	Castrated	Beagle	-	0.68	-	Unknown
Normal urinary bladder 25	4y0m	Male	Castrated	Pug	-	0.65	-	Unknown
Normal urinary bladder 26	•	Female	Intact	Shih Tzu	-	0.67	-	Unknown
Normal urinary bladder 27	12y0m	Female	Spayed	Pembroke Welsh Corgi	-	0.74	-	Unknown
Normal urinary bladder 28	7y11m	Female	Spayed	English springer spaniel	-	0.78	-	Unknown
Normal urinary bladder 29	15y5m	Male	Intact	Pomeranian	-	0.86	-	Unknown
Normal urinary bladder 30	1y0m	Male	Intact	Toy Poodle	-	0.85	-	Unknown
Normal urinary bladder 31	7y9m	Male	Castrated	Miniature Schnauzer	-	0.60	-	Unknown
Normal urinary bladder 32	11y0m	Male	Castrated	Cavalier King Charles Spaniel	-	0.83	-	Unknown
Normal urinary bladder 33	7y4m	Female	Intact	Mixed	-	0.75	-	Unknown
Normal urinary bladder 34	1y8m	Female	Spayed	Pomeranian	-	0.61	-	Unknown
Normal urinary bladder 35	2y11m	Female	Intact	French Bulldog	-	0.85	-	Unknown
Normal urinary bladder 36	3y2m	Male	Intact	French Bulldog	-	0.78	-	Unknown
Normal urinary bladder 37	7y2m	Female	Spayed	Pembroke Welsh Corgi	-	0.86	-	Unknown
Normal urinary bladder 38	6y10m	Male	Castrated	Papillon	-	0.57	-	Unknown
Normal urinary bladder 39	•	Male	Castrated	Cavalier King Charles Spaniel	-	0.60	_	Unknown

Abbreviations: CFA8, canine chromosome 8; CNA, copy number aberration; DFS, disease-free survival; OS, overall survival; UC, urothelial carcinoma.

ase	Age	Sex	Neutered	Breed	Diagnosis	BRAF mutation	ErbB2:CFA8 ratio	ErbB2 C
C 1	7y7m	Female	Intact	Miniature Dachshund	UC	+	0.88	-
C 2	8y3m	Female	Spayed	Shetland Sheepdog	UC	+	1.13	+
C 3	12y9m	Female	Spayed	Toy Poodle	UC	+	0.88	-
C 4	12y3m	Female	Intact	Papillon	UC	-	1.27	+
C 5	10y11m	Male	Intact	Yorkshire Terrier	UC	+	0.78	-
C 6	13y1m	Female	Spayed	Papillon	UC	+	1.16	+
C 7	11y10m	Female	Spayed	Miniature Dachshund	UC	+	0.99	-
C 8	10y2m	Female	Intact	Border Collie	UC	-	0.84	-
C 9	15y6m	Female	Spayed	Miniature Dachshund	UC	+	0.98	+
C 10 C 11	14y2m	Female Female	Spayed Intact	Miniature Dachshund	UC UC	+	1.12 0.92	+
C 12	8y9m 13y4m	Male	Intact	French Bulldog Pembroke Welsh Corgi	UC	-	0.92	_
C 13	11y2m	Female	Spayed	Shiba Inu	UC UC	+	0.95	_
C 14	14y10m	Male	Intact	Miniature Dachshund	UC	+	1.15	+
C 15	10y9m	Female	Spayed	Pembroke Welsh Corgi	UC	+	0.92	-
C 16	10y2m	Female	Spayed	Shih Tzu	UC	-	1.04	-
C 17	9y1m	Male	Intact	Chihuahua	UC	-	0.98	-
C 18	11y11m	Female	Spayed	Mixed	UC	+	1.32	+
19	9y1m	Female	Spayed	Shetland Sheepdog	UC	+	0.95	-
20	10y2m	Female	Spayed	Mixed	UC	-	0.83	-
21	11y7m	Male	Castrated	Miniature Dachshund	UC	+	2.29	+
22	13y6m	Female	Intact	Beagle	UC	+	1.80	+
23	9y6m	Female	Intact	Maltese	UC	+	4.61	+
24	16y2m	Female	Spayed	Pomeranian	UC	+	1.16	+
25	14y5m	Female	Spayed	Labrador Retriever	UC	+	1.39	+
26	12y11m	Female	Spayed	Shiba Inu	UC	+	1.88	+
27	14y4m	Female	Spayed	Miniature Dachshund	UC	+	0.95	-
28	8y8m	Male	Castrated	Cavalier King Charles Spaniel	UC	+	0.95	-
29	9y10m	Male	Intact	Pomeranian	UC	-	0.93	-
30	14y11m	Male	Intact	Toy Poodle	UC	-	0.89	-
31	13y8m	Female	Intact	Yorkshire Terrier	UC	+	1.01	-
32	14y2m	Male	Intact	Whippet English Setter	UC	+	1.03	-
33	10y7m	Female Male	Spayed Castrated	English Setter Miniature Pinscher	UC UC	+	1.27 0.71	-
34	11y6m 9y9m	Male Female	Castrated Spayed	Miniature Pinscher Miniature Dachshund	UC	+	0.71	-
36	9y9m 12y9m	Female	Spayed Spayed	Toy Poodle	UC	+	1.35	-
37	12y9m	Female		Mixed	UC		1.86	
: 38	13y5m	Male	Spayed Castrated	Chihuahua	UC		0.91	-
39	13y2m	Female	Spayed	Pomeranian	UC		1.03	_
40	11y0m	Female	Spayed	Miniature Dachshund	UC	-	1.03	_
41	12y7m	Female	Spayed	Miniature Dachshund	UC	+	1.08	_
42	8y2m	Female	Spayed	Miniature Schnauzer	UC	-	1.41	+
43	10y9m	Female	Spayed	Pomeranian	UC	+	0.91	_
44	13y7m	Male	Castrated	Miniature Pinscher	UC	+	1.00	_
45	12y9m	Female	Intact	Miniature Dachshund	UC	_	1.02	_
46	14y5m	Female	Spayed	Pembroke Welsh Corgi	UC	+	0.90	_
47	11y0m	Male	Castrated	Pomeranian	UC	+	0.92	_
48	15y10m	Female	Intact	West Highland White Terrier	UC	-	1.15	+
49	11y0m	Female	Spayed	Miniature Schnauzer	UC	-	0.87	-
50	12y3m	Female	Intact	French Bulldog	UC	+	1.46	+
51	11y10m	Female	Spayed	Mixed	UC	+	1.01	-
52	10y7m	Male	Castrated	Papillon	UC	-	0.97	-
53	9y7m	Female	Spayed	Miniature Dachshund	UC	-	1.14	+
54	13y9m	Male	Castrated	Miniature Dachshund	UC	+	0.89	-
sease control 1	10y10m	Female	Spayed	Jack Russell Terrier	Cystitis	-	1.00	-
ease control 2	4y9m	Female	Spayed	Miniature Schnauzer	Cystitis	-	0.98	-
ease control 5	10y7m	Male	Castrated	Yorkshire Terrier	Cystitis	-	0.90	-
ease control 9	16y1m	Male	Castrated	Shih Tzu	Cystitis	-	0.77	-
ease control 10	10y11m	Male	Intact	Miniature Dachshund	Cystitis	-	0.90	-
ease control 12	14y8m	Female	Intact	Miniature Dachshund	Cystitis	-	0.90	-
ease control 13	12y0m	Male	Castrated	Shih Tzu	Cystitis	-	0.96	-
ease control 15	11y0m	Female	Intact	Norfolk Terrier	Cystitis	-	0.84	-
ease control 16	7y5m	Female	Spayed	Yorkshire Terrier	Cystitis	-	0.93	-
ease control 20	13y11m	Male	Intact	Chihuahua	Cystitis	-	1.00	-
ease control 21	5y10m	Male	Castrated	Boston Terrier	Cystitis	-	0.99	-
ease control 23	10y11m	Male	Intact	American Cocker Spaniel	Cystitis	-	1.01	-
ease control 26	16y8m	Male	Intact	Miniature Dachshund	Cystitis	-	1.04	-
ease control 28	15y2m	Female	Spayed	Miniature Dachshund	Cystitis	-	1.00	-
ease control 29	13y1m	Female	Spayed	Miniature Dachshund	Cystitis	-	0.98	-
ease control 30	12y3m	Male	Intact	Pembroke Welsh Corgi	Cystitis	-	0.92	-
ease control 3	13y1m	Female	Spayed	Yorkshire Terrier	Polypoid cystitis	-	0.96	-
ease control 4	9y8m	Female	Spayed	Mixed	Polypoid cystitis	-	0.77	-
ease control 6	10y11m	Female	Spayed	Caim Terrier	Polypoid cystitis	-	0.93	-
0000 0	9y5m	Male	Castrated	Toy Poodle	Polypoid cystitis	-	0.87	-
	13y11m	Female	Spayed	Shih Tzu	Polypoid cystitis	-	1.09	-
ease control 18		Female	Spayed	Mixed Shih Tzu	Polypoid cystitis	-	0.79 0.86	-
ease control 18 ease control 19	11y9m				Polypoid cystitis Polypoid cystitis	_		-
ease control 18 ease control 19 ease control 22	11y9m 13y4m	Female	Spayed	look Bussell Tarrian			0.87	-
ease control 18 ease control 19 ease control 22 ease control 24	11y9m 13y4m 11y9m	Female Male	Intact	Jack Russell Terrier Miniature Dachehund			1.01	_
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25	11y9m 13y4m 11y9m 16y4m	Female Male Male	Intact Castrated	Miniature Dachshund	Polypoid cystitis	-	1.01	-
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25 ease control 27	11y9m 13y4m 11y9m 16y4m 10y5m	Female Male Male Male	Intact Castrated Castrated	Miniature Dachshund Yorkshire Terrier	Polypoid cystitis Polypoid cystitis	-	0.97	-
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25 ease control 27 ease control 7	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m	Female Male Male Male Male	Intact Castrated Castrated Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier	Polypoid cystitis Polypoid cystitis Cystolithiasis	-	0.97 1.08	-
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25 ease control 27 ease control 7 ease control 11	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m	Female Male Male Male Male Female	Intact Castrated Castrated Castrated Spayed	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis	- - -	0.97 1.08 1.10	-
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25 ease control 27 ease control 7 ease control 11 ease control 14	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y6m	Female Male Male Male Male Female Female	Intact Castrated Castrated Castrated Spayed Spayed	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis	- - -	0.97 1.08 1.10 0.96	-
ease control 18 ease control 19 ease control 22 ease control 24 ease control 25 ease control 27 ease control 7 ease control 11 ease control 14 ease control 14 ease control 17	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y6m 9y11m	Female Male Male Male Male Female Female Male	Intact Castrated Castrated Castrated Spayed Spayed Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier Chihuahua	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis Cystolithiasis	- - -	0.97 1.08 1.10 0.96 0.85	-
ease control 18 ease control 29 ease control 24 ease control 25 ease control 25 ease control 27 ease control 77 ease control 11 ease control 14 ease control 17 eathy control 1	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y6m 9y11m 8y5m	Female Male Male Male Male Female Female Male	Intact Castrated Castrated Castrated Spayed Spayed Castrated Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier Chihuahua Labrador Retriver	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis Cystolithiasis Normal urinary bladder	-	0.97 1.08 1.10 0.96 0.85	-
ease control 18 ease control 29 ease control 24 ease control 25 ease control 27 ease control 27 ease control 7 ease control 17 ease control 11 ease control 14 ease control 17	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y6m 9y11m 8y5m 11y11m	Female Male Male Male Male Female Female Male Male	Intact Castrated Castrated Castrated Spayed Spayed Castrated Castrated Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier Chihuahua Labrador Retriver Beagle	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis Cystolithiasis Normal urinary bladder Normal urinary bladder	-	0.97 1.08 1.10 0.96 0.85 0.98 0.92	-
ease control 18 ease control 29 ease control 22 ease control 25 ease control 27 ease control 27 ease control 7 ease control 7 ease control 11 ease control 14 ease control 17 ease control 17 ease control 14 ease control 17	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y11m 8y5m 11y11m 8y10m	Female Male Male Male Male Female Female Male Male Male Male Male Male	Intact Castrated Castrated Castrated Spayed Spayed Castrated Castrated Castrated Castrated Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier Chihuahua Labrador Retriver Beagle Beagle	Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis Cystolithiasis Normal urinary bladder Normal urinary bladder	- - - - - -	0.97 1.08 1.10 0.96 0.85 0.98 0.92 0.99	-
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ease control 8 ease control 78 ease control 78 ease control 79 ease control 22 ease control 24 ease control 25 ease control 25 ease control 72 ease control 71 ease control 61 ease control 61 ease control 61 eathy control 71 eathy contro	11y9m 13y4m 11y9m 16y4m 10y5m 2y0m 2y6m 9y11m 8y5m 11y11m 8y10m 9y4m 8y1m 9y3m 9y9m	Female Male Male Male Male Female Male Male Male Male Male Male Male M	Intact Castrated Castrated Castrated Spayed Spayed Castrated	Miniature Dachshund Yorkshire Terrier Scottish Terrier Mixed Scottish terrier Chihuahua Labrador Retriver Beagle Beagle Beagle Beagle Beagle Beagle Beagle	Polypoid cystitis Polypoid cystitis Polypoid cystitis Cystolithiasis Cystolithiasis Cystolithiasis Normal urinary bladder	- - - - - - - - - - - - - - - - - - -	0.97 1.08 1.10 0.96 0.85 0.98 0.92 0.99 0.95 0.97 0.99	-
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Table S3. Association of *ErbB2* copy number aberration (CNA) with *BRAF* mutation in dogs with urothelial carcinoma.

Sample	BRAF mutation	ErbB2 CNA	D	
Sample	BRAF IIIulalion	Positive	Negative	— <i>г</i>
Urinary bladder tissue	Positive	8	14	0.7272
	Negative	4	10	
Urinary sediment	Positive	14	24	0.7639
	Negative	5	11	

Table 4. Association of ErbB2 copy number aberration (CNA) and clinical characteristics in dogs with urothelial carcinoma that underwent total cystectomy.

		ErbB2 CNA	ErbB2 CNA		
		Positive $(n = 8)$	Negative $(n = 17)$	_ P	
Age (months)	< 140	2	10	0.2016	
	≥ 140	6	7		
Sex	Male	1	3	1.0000	
	Female	7	14		
Neutered status	Yes	4	8	1.0000	
	No	4	9		
Tumor T stage	T1	3	4	0.6396	
	T2, T3	5	13		
Lymph node involvement	N0	7	15	1.0000	
	N+	1	2		
Distant metastasis	MO	8	17	1.0000	
	M+	0	0		
Preoperative NSAIDs	Yes	6	7	0.2016	
	No	2	10		
Preoperative chemotherapy	Yes	0	1	1.0000	
	No	8	16		
Postoperative NSAIDs	Yes	7	14	1.0000	
•	No	1	3		
Postoperative chemotherapy	Yes	2	4	1.0000	
,	No	6	13		

Abbreviation: NSAIDs, non-steroidal anti-inflammatory drugs.