

Case	Sex	WS diagnostic confidence	Age tumor diagnosis	Post-mortem diagnosis?	Spectrum tumor code	ICD-10 (if malignant)	Histopathologic diagnosis	Tumor site	Notes	Reference for case report in Goto et al. 1996	Reference for neoplasm in Table 1 of Goto et al. 1996	Notes/Discrepancies from Goto et al. 1996	Ref1	Ref2	Ref3	Ref4	Ref5	Ref6	
Cases residing in Japan																			
1	M	definite	36		1	C47-C49	undifferentiated pleomorphic sarcoma	L olecranon		19	19		[1]						
2	M	possible	26		1	C47-C49	leiomyosarcoma	R forearm		19	19		[1]						
3	F	probable	32		1	C47-C49	undifferentiated pleomorphic sarcoma	L elbow		19	19		[1]						
4	M	probable	45		2	C40-41	osteosarcoma	L tibia	unconfirmed tumor in the cerebellum, likely metastasis from gastric cancer; also voice changes observed at 6y	23, 17	23		[2]	[3]					
4	M	probable	45		31	C43	malignant melanoma	L foot, plantar surface	unconfirmed tumor in the cerebellum, likely metastasis from gastric cancer; also voice changes observed at 6y	23, 17	23		[2]	[3]					
4	M	probable	45		8	C16	gastric adenocarcinoma	stomach	unconfirmed tumor in the cerebellum, likely metastasis from gastric cancer; also voice changes observed at 6y	23, 17	23		[2]	[3]					
4	M	probable	45		1	C33-34	leiomyosarcoma	R lung	unconfirmed tumor in the cerebellum, likely metastasis from gastric cancer; also voice changes observed at 6y	23, 17	23		[2]	[3]					
4	M	probable	45	Y	72	C73	papillary carcinoma	thyroid	unconfirmed tumor in the cerebellum, likely metastasis from gastric cancer; also voice changes observed at 6y	23, 17	23		[2]	[3]					
5	M	definite	33		4		meningioma	(meningioma)		66	66		[4]	[5]					
6	M	possible	34*		4		meningioma	(meningioma)		68	68		[6]						
6	M	possible	41		5		myelofibrosis	(hematological)	report indicates myelofibrosis may be due to diphenylhydantoin therapy for seizure	68	68		[6]						
6	M	possible	41	Y	71		follicular adenomas	thyroid		68			[6]						
7	M	probable	39	Y	4		meningioma	R occipital dura mater		69	69		[7]	[8]					
8	M	possible	40		33	C15	malignant melanoma	esophagus		50	50		[9]						
9	M	probable	28		4		meningioma	L parasagittal region		70	70		[10]	[11]	[12]				
10	M	probable	42		140	C67	papillary transitional cell carcinoma	bladder		138	138		[13]						
12	F	definite	49		71	C73	follicular carcinoma	thyroid		6, 103	103		[14]	[15]					
13	M	definite	33		1	C47-C49	pleomorphic rhabdomyosarcoma	R lower leg	some discrepancies, but case in Sato et al. 1988 seems likely to be a repeat report	6, 15	15		[14]	[16]					
14	F	probable	33		71	C73	follicular carcinoma	thyroid, R lobe		6	6		[14]						
15	M	probable	67		73	C73	anaplastic carcinoma	thyroid		6, 103	103		[14]	[15]					
17	M	possible	40		31	C43	malignant melanoma	R foot, 5th toe		56	56		[17]						
18	F	definite	49		2	C40-41	osteosarcoma	R tibia		36	36		[18]						
19	M	definite	40		1	C47-C49	leiomyosarcoma	L bicep (cubital)	patient also had a subtotal thyroidectomy at age 26, but thyroid lesion not described	24	24		[19]						
19	M	definite	40*	Y	71		follicular adenoma	thyroid	patient also had a subtotal thyroidectomy at age 26, but thyroid lesion not described	24			[19]						
20	F	definite	38		140	C67	transitional cell carcinoma	bladder		46	46		[20]	[21]	[14]				
20	F	definite	45		32	C30-31	malignant melanoma	L nasal cavity		46	46		[20]	[21]	[14]				
21	F	probable	43		1	C47-C49	myxofibrosarcoma	R foot		18	18		[22]						
22	F	probable	40		2	C47-C49	osteosarcoma (extraskeletal)	R thigh		42	42		[23]						
23	F	probable	47*		72	C73	papillary carcinoma	thyroid		37	37		[24]						
23	F	probable	49*		2	C40-41	osteosarcoma	R lower leg		37	37		[24]						
24	M	definite	53		1	C47-C49	synovial sarcoma	L hand		27	27		[25]	[26]					
25	F	probable	34		200	C53 / C54	uterine cancer NOS	uterus		38	38		[27]						
25	F	probable	36		71	C73	follicular carcinoma	thyroid, R lobe		38	38		[27]						
25	F	probable	37*		2	C40-41	osteosarcoma	L knee		38	38		[27]						
26	M	definite	47		2	C40-41	osteosarcoma	R radius		39	39		[28]						
27	F	probable	45*		32	C30-31	malignant melanoma	L nasal cavity		49	49		[29]						
27	F	probable	46		31	C43	malignant melanoma	R foot, 5th toe		49	49		[29]						
28	F	probable	32		130	C30-31	squamous cell carcinoma	L nasal cavity		131	131		[30]						
30	F	uk	44*		33	C51-52, C55, C57.7-9, C58	malignant melanoma	R large pudental lip					[31]						
30	F	uk	44*		31	C43	malignant melanoma	L foot, plantar surface, near toe and near heel					[31]						
31	M	definite	38*		9	C22 / C23-24	cholangiocarcinoma	liver, L lobe and hilum		121	121		[32]						
32	M	definite	37		2	C40-41	osteosarcoma	L forearm, dorsal aspect					[33]						
33	F	probable	32*		72	C73	papillary carcinoma	thyroid		similar to 88	similar to 88	citation appears to be correct citation for reference no. 88; also, seems to have been mis-specified as reference no. 85 in Table 1	[34]	[35]					
33	F	probable	40		50	C91-95	acute myelogenous leukemia (FAB M4, after RAEB-II-NDS)	(hematological)	report indicates leukemia may be related to 7-year course of radioactive iodine for the treatment of thyroid cancer	similar to 88	similar to 88	citation appears to be correct citation for reference no. 88; also, seems to have been mis-specified as reference no. 85 in Table 1	[34]	[35]					
34	F	uk	45		1	C47-C49	undifferentiated pleomorphic sarcoma	R knee		17	17		[3]						
36	M	uk	65		120	C44	squamous cell carcinoma	L hand		17	17		[3]						
37	F	uk	46		9	C22 / C23-24	cholangiocarcinoma	biliary tract		123	123		[36]						
38	M	possible	58		9	C22 / C23-25	cholangiocarcinoma	common bile duct		122	122		[37]						
39	F	probable	48		31	C43	malignant melanoma	R heel		54	54		[38]						
41	M	definite	41		33	C30-31	mucosal malignant melanoma	upper lip		51	51		[39]						
43	F	definite	43		31	C43	malignant melanoma	inner L malleolar area		60	60		[40]						
44	M	possible	36		31	C43	malignant melanoma	L sole		53	53		[42]						
46	F	uk	uk		130	C30-31	nasal cancer NOS	paranasal cavity		133	133		[43]						
46	F	uk	uk		200	C53/C54	uterine cancer NOS	uterus		133	133		[43]						
47	M	probable	59		31	C43	acral lentiginous melanoma	R thumb					[44]						
48	M	possible	36		72	C73	papillary carcinoma/follicular adenomas	thyroid		105	105		[45]						
49	M	definite	27		74		thyroid neoplasm NOS	thyroid, R lobe		73	73		[46]						
49	M	definite	46		72	C73	papillary carcinoma	thyroid, L lobe		73	73		[46]						
49	M	definite	46		4		meningioma	posterior falx to tentorium cerebelli		73	73		[46]						
51	M	uk	53		140	C67	transitional cell carcinoma	bladder		139	139		[47]						
52	M	definite	43		130	C30-31	undifferentiated carcinoma NOS	R nasal cavity		132	132		[48]						
53	F	uk	38		110	C50	intraductal carcinoma	R breast	malignancy shows cribriform, papillary patterns; reported as solid tubular histology	124	124		[49]						
54	M	possible	42		51	C88, C80	plasmacytoma	paranasal cavity, R ethmoid		93	93		[50]						
55	M	definite	36		50	C91-95	acute myelogenous leukemia	(hematological)	voice changes observed at age 10	86, 87	86, 87	Goto et al. 1996 counts each as separate reports, but due to the same death date, we count only one malignancy	[51]	[52]					
56	F	possible	48		9	C22 / C23-24	liver cancer NOS	hepatic portal region		118	118		[53]						
57	M	definite	47		8	C16	gastric adenocarcinoma	pyloric antrum		112	112		[54]						
58	M	uk	44		5		myelodysplasia/myelofibrosis	(hematological)		91	91		[55]						
60	M	uk	40		9	C22 / C23-24	hepatocellular carcinoma	liver		99	99		[56]						
61	F	definite	46		32	C30-31	malignant melanoma	R nasal cavity		48	48		[57]						
64	M	possible	62		4		meningioma	R brain		67, 82	67	Goto et al. 1996 labels the age at diagnosis as 69y	[58]	[59]					
64	M	possible	62		5		myelodysplasia	(hematological)		67, 82	67	Goto et al. 1996 labels the age at diagnosis as 69y	[58]	[59]					
65	F	definite	32		71	C73	follicular carcinoma	thyroid, L lobe		101	101		[60]						
68	F	uk	47		1	C47-C49	leiomyosarcoma	R knee		22	22		[61]						
69	F	uk	44		71	C73	follicular carcinoma	thyroid, L lobe	additional thyroid adenoma NOS of the R lobe diagnosed at age 44	22	22		[61]						
70	M	definite	43		74		thyroid neoplasm NOS	thyroid		14	14		[62]	[63]	[64]				
70	M	definite	47*		61	C47-C49	malignant peripheral nerve sheath tumor	R knee, posteromedial popliteal region		14	14		[62]	[63]	[64]				
70	M	definite	50		1	C47-C49	undifferentiated pleomorphic sarcoma	R thigh, proximal/lateral region		14	14		[62]	[63]	[64]				
70	M	definite	57		2	C40-41	osteosarcoma	R calcaneal region		14	14		[62]	[63]	[64]				
71	M	probable	53		8	C16	gastric adenocarcinoma	pyloric antrum, greater curvature		110	110		[65]						

312	M	probable	<53		190		laryngeal neoplasm NOS	vocal cord		134	134	malignancy seems unclear from the article	[129]					
314	F	uk	uk		110	C50	breast carcinoma NOS	breast		60	60		[40]					
315	F	uk	uk		110	C50	breast carcinoma NOS	breast		60	60		[40]					
333	uk	uk	20		2	C40-41	osteosarcoma	uk				Goto et al. 1996	[130]					
335	F	definite	40		71	C73	follicular carcinoma	thyroid	this appears to be a follicular carcinoma in a patient mentioned in the Goto et al. 1981 publication (but tumor not referred to in that paper)	5, Goto et al. 1996	5	this carcinoma was likely in a patient reported in the referenced article (follicular carcinoma not mentioned in referenced article)	[131]	[80]	[130]			
336	F	definite	42		71	C73	follicular carcinoma	thyroid	PC from Dr. H. Matsuno				[131]					
342	F	uk	40*		32	C30-31	malignant melanoma	nasal cavity		46	46		[20]					
343	M	uk	37*		8	C16	gastric adenocarcinoma	stomach		23, 17	23		[2]	[3]				
345	F	definite	57		9	C22 / C23-25	cholangiocarcinoma	liver	case was found after formal search closed; it is included in spectrum counts, but not in risk estimation				[132]					
346	M	uk	43		50	C91-95	acute myelogenous leukemia NOS	(hematological)	Mita et al. 1996 (Table 3) cites other articles reporting this patient with a low WBC count but 3.6% blasts; low WBC count may reflect prior therapy	similar to 84	similar to 84	the referenced article was not found, but this abstract likely refers to same case	[133]					
347	M	probable	41		50	C91-95	acute myelogenous leukemia NOS	(hematological)		similar to 85	similar to 85	this appears to be the referenced article (the journal name was mis-specified in Goto et al. 1996)	[134]					
348	M	uk	39		50	C91-95	acute myelogenous leukemia (FAB M2)	(hematological)					[135]					
349	M	definite	34		71	C73	follicular/clear cell carcinoma	thyroid		89	89		[136]	[137]				
349	M	definite	34		50	C91-95	acute myelogenous leukemia (FAB M6) (erythroleukemia)	(hematological)		89	89	erythroleukemia is only described in the Maruyama et al. 1987 paper, but Goto et al. 1996 provides reference to the patient in Kaneko et al. 1986	[136]	[137]				
403	F	definite	29		71		follicular adenoma	thyroid					[138]					
403	F	definite	31		61		neuroma	spinal level T11/T12/L1					[138]					
Cases residing outside of Japan																		
153	M	definite	46		4		meningioma	L frontal cortex, parasagittal					[139]					
154	M	definite	43		160		pancreatic adenocarcinoma	pancreas					[140]					
155	F	definite	47		2		osteosarcoma	L knee	preceding aggressive osteoblastoma at site	43	43		[141]					
156	F	definite	30		4		meningioma	petrosal with cavernous sinus invasion					[142]					
157	F	definite	43*		4		meningioma	R tentorial					[143]					
158	M	definite	37		50		acute leukemia NOS	(hematological)					[144]					
159	F	definite	41		31		malignant melanoma	R heel					[145]					
160	M	possible	40		140		transitional cell carcinoma NOS	bladder					[146]					
161	M	probable	<44		31		malignant melanoma	finger	cutaneous melanoma reported to have been diagnosed "as a child"				[147]					
161	M	probable	44		50		acute myelogenous leukemia (M2)	(hematological)					[147]					
162	M	definite	23		2		osteochondroma	ilium					[148]					
163	M	definite	29		5		RAEB-t	(hematological)		95	95		[149]					
164	F	definite	33		151		vulvar carcinoma NOS	vulva					[150]					
165	F	possible	50		6		malignant brain neoplasm NOS	brain					[151]					
166	F	probable	27		200		leiomyoma	uterus					[152]					
167	F	probable	50		2		osteosarcoma	R malleolar area		44	44		[153]					
168	M	probable	52		120		basal cell carcinoma	R tip of nose		128	128		[154]					
168	M	probable	57		120		squamous cell carcinoma	scalp and L forearm		128			[154]					
171	uk	probable	uk		2		osteosarcoma	orbit		45	45	Goto et al. 1996 specifies patient is male; Kizukuri et al. 1980 specifies at age diagnosis is 51y.	[155]	[156]				
171	uk	probable	uk		74		thyroid adenoma NOS	thyroid		45		Goto et al. 1996 specifies patient is male	[155]	[156]				
171	uk	probable	uk	Y	4		meningioma	(meningioma)		45	45	Goto et al. 1996 specifies patient is male	[155]	[156]				
172	M	possible	46		1		fibrosarcoma	mediastinum		32	32		[157]					
172	M	possible	57		120		basal cell carcinoma	nose (x2) and upper lip		32	32		[157]					
173	F	probable	42		6		hemangioblastoma	spine level D11/D12		33	33		[158]					
174	M	definite	39		61		malignant peripheral nerve sheath tumor	R thigh		29	29		[159]					
175	F	probable	49		2		osteosarcoma	R 1st metatarsal/cuneiform bones		29	29		[159]					
176	F	probable	24		50		acute myelogenous leukemia NOS	(hematological)		94	94		[160]					
177	M	possible	49		6		astrocytoma	L temporal lobe		99	99		[161]					
178	F	definite	34		5		myelofibrosis	(hematological)		96	96		[162]					
179	M	definite	40		8		gastric adenocarcinoma	stomach		114	114		[163]					
180	F	probable	40		1		undifferentiated pleomorphic sarcoma	L lateral thigh		31	31		[164]					
180	F	probable	41		150		cystadenocarcinoma	ovary		31			[164]					
181	M	probable	45		4		meningioma	(meningioma)	These case reports appear to be duplicate reports; the first reference is the most complete	81	81		[165]	[166]	[167]			
182	M	possible	48		2		bone neoplasm NOS	uk					[165]					
183	F	definite	52		120		squamous cell carcinoma	cheek		144, 114	114		[168]					
183	F	definite	52		120		basal cell carcinoma	face (x2)		144, 114			[168]					
185	F	definite	<47		110		breast carcinoma NOS	breast										
185	F	definite	<47		150		ovarian carcinoma NOS	ovary					INJH1010**					
185	F	definite	47		160		pancreatic adenocarcinoma	head of pancreas					INJH1010**					
185	F	definite	47	Y	170		carcinoid	lung, L upper lobe					INJH1010**					
186	M	definite	42		9		hepatocellular carcinoma	liver	onset of greying of the hair at 8y	117, 45	117		[169]	[170]	[171]	[172]	[155]	[156]
186	M	definite	42	Y	220		cortical adenoma	adrenal gland	onset of greying of the hair at 8y	117, 45			[169]	[170]	[171]	[172]	[155]	[156]
187	M	definite	38		1		fibrosarcoma	L forearm		117, 30, 45	30		[169]	[173]	[172]	[155]	[156]	
188	F	definite	42		9		cholangiocarcinoma	biliary tract		77	77		[174]					
188	F	definite	42		4		meningioma	(meningioma)		77	77		[174]					
188	F	definite	42	Y	220		cortical adenoma	adrenal gland		77			[174]					
189	F	uk	35		200		leiomyosarcoma	ilium		35	35		[175]					
190	F	possible	40*		31		malignant melanoma	R hip		64	64		[176]					
191	M	possible	56		31		acral lentiginous melanoma	L thumb	additional lentigo maligna melanoma under L ear diagnosed at age 56	63	63		[177]					
193	M	definite	39		72		papillary carcinoma	thyroid		109	109		[178]					
194	M	uk	38*		120		squamous cell carcinoma in situ	R temple		130	130		[179]					
195	F	probable	39		1		spindle cell sarcoma NOS	R forearm		34	34		[180]					
196	F	definite	38*		110		breast carcinoma NOS	R breast		125	125		[181]					
197	F	possible	50*		127		squamous cell carcinoma	L calf		127	127		[182]					
198	F	probable	42		120		squamous cell carcinoma	L malleolar area, Achilles tendon		129	129		[183]					
199	M	possible	56*		4		meningioma	L parietal		80	80		[184]					
200	F	probable	31*		4		meningioma	L parietal		78	78		[185]					
200	F	probable	49*		74		thyroid carcinoma NOS	thyroid		78	78		[185]					
201	F	definite	34		4		meningioma	L fronto-parietal		79	79		[186]					
202	M	possible	48		260		prostate carcinoma	prostate		142	142		[187]					
203	F	definite	51		4		meningioma	(meningioma)	patient seems to be Case 1 in Epstein et al. 1966 (vs. Case 2, which is claimed)	4	4		[188]					
204	M	uk	32*		50		acute leukemia NOS	(hematological)		31	31		[164]					
205	F	uk	54*		74		thyroid carcinoma NOS	thyroid					[139]					
206	M	uk	29*		120		basal cell carcinoma	uk		114, 144	114		[163]					

Color code and abbreviations

uk unknown
 patient with multiple neoplasms (listed 1 neoplasm/row)
 * age at tumor diagnosis is approximate
 y years of age

R/L right/left
NOS not otherwise specified
RAEB (-) refractory anemia with an excess of blasts (-in transformation)
MDS myelodysplasia
PO personal observation
PC personal communication
INU1010** unpublished case #INU1010 from the International Registry of Werner Syndrome
(personal communication from G. M. Martin and J. Oshima)

Note on non-melanoma skin carcinomas in cases residing outside of Japan: our counts exceed those listed in Goto et al. 1996, so we cannot discern which were counted. Here, each patient cited in that article is assigned only 1 non-melanoma skin carcinoma.

Note ICD-10 codes: ICD-10 codes are specified only for malignancies in Japan-resident cases

Spectrum Tumor Codes*

Non-epithelial tumors

Code	Code	Type
1		soft tissue sarcoma
	11	soft tissue sarcoma - site unspecified
2		bone (including extra-skeletal osteosarcoma)
3		na
	31	melanoma of skin
	32	melanoma, intranasal
	33	melanoma - other or site unspecified
4		meningioma
5		other hematologic & lymphoid
	50	leukemia
	51	multiple myeloma
6		other CNS
	61	peripheral nerve sheath tumor (grouped with soft tissue sarcomas)

Epithelial tumors (and some non-epithelial with site specified)

Code	Code	Type
7		na
	71	thyroid--follicular
	72	thyroid--papillary
	73	thyroid--anaplastic
	74	thyroid--other and unknown
8		gastric
9		liver & biliary
110		breast
120		skin (non-melanoma)
130		nasal cavity
140		bladder
150		ovary
151		vulva
160		pancreas
170		lung
180		lip and mouth
190		larynx
200		uterine
210		ureter
220		adrenal
230		esophagus
240		kidney
250		eye
260		prostate / testis
270		pharynx
280		unknown
290		retroperitoneum
300		colon

*codes indicate classifications used for the spectrum of neoplasia analyses

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