

Expression of SRY-related HMG Box Transcription Factors (Sox) 2 and 9 in Craniopharyngioma Subtypes and Surrounding Brain Tissue

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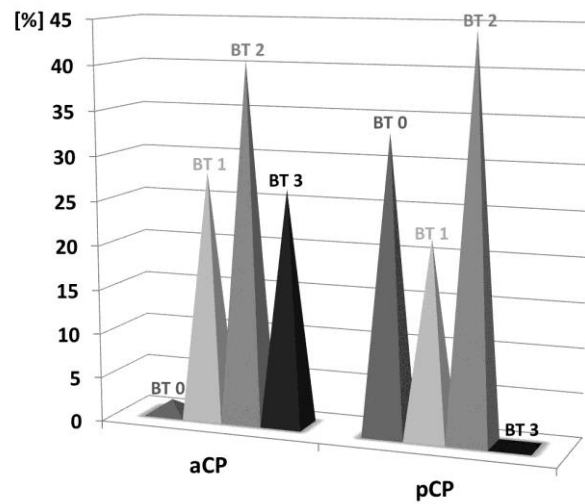
Patient	Sex	Age	Age Group	Invasive-ness	Sox2			Sox9					
					Tumor	BT	Rel. mRNA	PS (0-4)	IS (0-3)	TIS	Scoring Group (S1-S3)	BT (0-3)	Rel. mRNA
pCP													
pCP1	m	52	a	no	-	-	3.1879	1	1	1	S2	0	3.0061
pCP2	m	19	a	no	-	-	0.9873	1	1	1	S2	2	1.6222
pCP3	f	49	a	no	-	-	1.0036	2	1	2	S2	2	1.0002
pCP4	m	57	a	-	-	-	7.0425	2	2	4	S2	2	1.7275
pCP5	f	46	a	no	-	-	0.7921	2	1	2	S2	1	0.4205
pCP6	m	40	a	yes	-	-	16.2004	2	1	2	S2	1	17.3091
pCP7	f	56	a	-	-	-	-	2	1	2	S2	2	-
pCP8	m	31	a	no	-	-	-	1	1	1	S2	0	-
pCP9	m	62	a	yes	-	-	2.1143	2	2	4	S2	0	46.1707
aCP													
aCP1	m	48	a	no	-	-	-	3	3	9	S3	1	-
aCP2	m	9	p	-	-	-	-	2	3	6	S3	3	-
aCP3	m	50	a	no	-	-	1.0756	3	1	3	S2	1	28.9128
aCP4	f	3	p	-	-	-	-	3	2	6	S3	2	-
aCP5	f	29	a	yes	-	+	-	4	3	12	S3	2	-
aCP6	f	33	a	-	-	-	15.9290	2	3	6	S3	2	5.8463
aCP7	f	14	p	-	-	-	-	3	1	3	S2	1	-
aCP8	m	8	p	-	-	-	17.6287	3	3	9	S3	2	7.8862
aCP9	m	58	a	-	-	-	-	3	3	9	S3	2	-
aCP10	f	2	p	-	-	-	-	2	1	2	S2	2	-
aCP11	f	9	p	no	-	-	-	3	2	6	S3	1	-
aCP12	m	32	a	no	-	-	-	2	2	4	S2	1	-
aCP13	m	28	a	no	-	+	-	3	2	6	S3	2	-
aCP14	m	19	a	no	-	-	-	3	3	9	S3	2	-
aCP15	m	22	a	no	-	-	-	4	3	12	S3	3	-
aCP16	f	60	a	-	-	-	-	4	3	12	S3	2	-
aCP17	m	56	a	no	-	-	0.2786	3	2	6	S3	1	2.6231
aCP18	m	70	a	no	-	-	1.1968	4	3	12	S3	3	1.8866
aCP19	m	35	a	no	-	+	23.7424	3	3	9	S3	3	6.8355
aCP20	f	35	a	no	-	+	7.9801	2	2	4	S2	2	0.4827
aCP21	m	24	a	no	-	-	-	2	1	2	S2	1	-
aCP22	m	15	p	no	-	+	0.0993	3	2	6	S3	1	6.1443
aCP23	f	54	a	yes	-	-	0.2121	2	2	4	S2	1	37.0092
aCP24	m	49	a	-	-	-	-	3	3	9	S3	2	-
aCP25	m	13	p	no	-	+	-	3	3	9	S3	2	-
aCP26	f	4	p	yes	-	-	1.1695	3	3	9	S3	3	2.6062
aCP27	f	47	a	-	+	+	0.2955	4	3	12	S3	1	6.9234
aCP28	m	35	a	yes	-	+	-	3	1	3	S2	3	-
aCP29	f	4	p	yes	-	-	-	3	1	3	S2	2	-
aCP30	f	11	p	yes	+	-	0.5013	3	3	9	S3	1	7.0292
aCP31	m	39	a	no	-	-	-	3	2	6	S3	1	-
aCP32	m	7	p	yes	-	-	0.5865	3	2	6	S3	1	14.7976
aCP33	m	50	a	yes	-	+	5.6807	3	3	9	S3	2	12.3450
aCP34	f	6	p	-	-	-	-	1	1	1	S2	2	-
aCP35	m	37	a	yes	-	-	-	3	2	6	S3	2	-
aCP36	f	58	a	no	-	-	-	2	2	4	S2	1	-
aCP37	f	63	a	no	-	-	-	2	3	6	S3	2	-
aCP38	m	32	a	yes	-	-	4.1506	3	3	9	S3	1	21.5289
aCP39	m	8	p	yes	-	-	0.3211	2	2	4	S2	0	44.1824
aCP40	m	47	a	yes	-	-	1.6104	4	3	12	S3	1	155.0342
aCP41	m	17	p	yes	-	+	-	3	2	6	S3	3	-
aCP42	f	31	a	-	-	-	-	2	1	2	S2	2	-
aCP43	f	47	a	yes	-	+	0.8097	3	2	6	S3	2	5.5244
aCP44	m	3	p	no	-	-	-	4	3	12	S3	1	-
aCP45	f	5	p	no	-	+	0.1632	3	3	9	S3	3	3.2313
aCP46	f	60	a	-	-	+	-	3	3	9	S3	3	-
aCP47	m	72	a	no	-	+	0.7583	3	3	9	S3	2	76.8999
aCP48	f	16	p	no	+	+	2.5441	3	3	9	S3	3	78.7769
aCP49	f	38	a	yes	-	+	10.4515	4	3	12	S3	3	9.3488
aCP50	m	39	a	yes	-	+	1.8435	3	2	6	S3	2	23.5158
aCP51	m	1	p	-	-	-	-	3	3	9	S3	2	-
aCP52	m	58	a	no	-	+	0.8689	3	3	9	S3	2	33.8493
aCP53	m	48	a	no	-	-	0.3118	3	3	9	S3	2	34.3797
aCP54	m	28	a	yes	-	-	-	3	3	9	S3	2	-
aCP55	f	7	p	-	-	+	-	3	2	6	S3	3	-

aCP56	m	19	a	-	+	+	-	4	3	12	S3	3	-
aCP57	m	9	p	-	-	-	6.3787	4	3	12	S3	3	8.6119
aCP58	f	54	a	-	-	+	-	4	3	12	S3	1	-
aCP59	m	6	p	-	+	+	-	3	3	9	S3	3	-
aCP60	m	67	a	-	-	+	-	3	2	6	S3	3	-
aCP61	m	29	a	-	-	+	-	3	3	9	S3	2	-
aCP62	f	58	a	-	-	-	-	3	2	6	S3	*	-
aCP63	m	66	a	yes	-	+	-	4	3	12	S3	3	-
aCP64	m	7	p	yes	-	-	-	3	3	9	S3	*	-

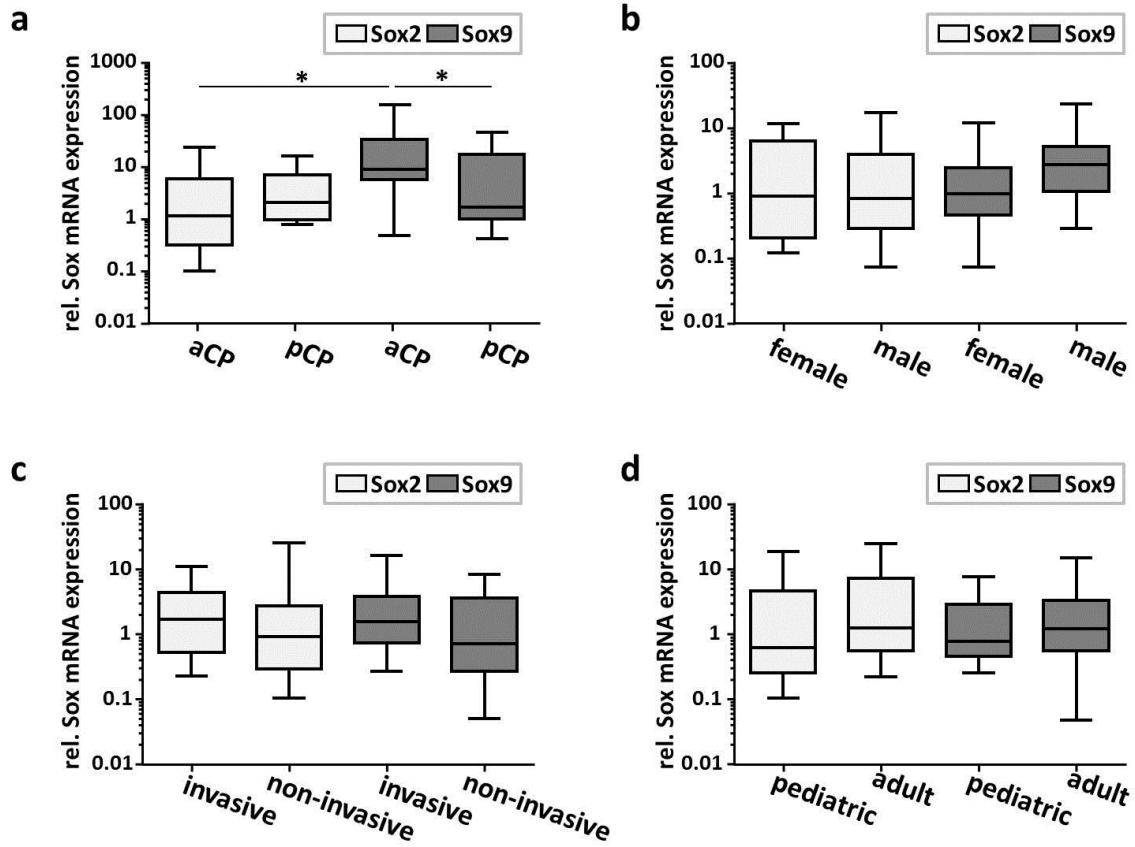
S-Tab.1: Detailed clinical data and results of immunohistochemical Sox2 and Sox9 stainings as well as mRNA expression. This overview includes patient gender, age, age group, tumor invasiveness, detailed immunohistochemical evaluation data (PS= proportion score; IS= intensity score; TIS= total immunostaining score; BT = brain tissue) and relative mRNA expression (pap3 served as calibrator and was set as 1) for all patients with aCP and pCP included in this study. (*) marks two cases of aCP for which an evaluation of the surrounding brain tissue was not possible as there were only very small areas of normal brain parenchyma in the histological section.

Gene Symbol	Forward primer 5' - 3'	Reverse Primer 3' - 5'	Fragment length (bp)	Species
GAPDH	caacgaccactttgtcaagc	tcttcaaggggtctacatgg	237	human
SOX2	ttacgcgcacatgaacggct	tgcgagtaggacatgctgta	209	human
SOX9	atgaacgccttcatggtgt	tctcgctctcgttcagaagt	126	human

S-Tab. 2: Sequences of mRNA-specific primer employed in quantitative real time PCR analyses.



S-Fig.1: Percentage shares of the scoring results of Sox9+ cells in the tumor surrounding brain tissue. Sox9+ cells could be detected in the tumor-surrounding brain tissue of both CP subtypes with a stronger representation in aCP specimens. Exact aCP scoring data: BT 0 1.6%; BT 1 28.1%; BT 2 40.6%; BT 3 26.6%; 3.1% not available. Exact pCP scoring data: BT 0 33%; BT 1 22%; BT 2 45%; BT 3 0%. BT 0 = no immunopositivity; BT 1 = individual Sox9+ cells (<10%); BT 2 = moderate fraction of Sox9+ cells (10-50%); BT 3 = high fraction of Sox9+ cells (> 50%).



S-Fig. 2: Relative SOX2 and SOX9 gene expression in CP subtypes and analysis regarding clinical parameters in aCP .

(a) In contrast to SOX2 ($p > 0.05$), SOX9 gene expression were significantly increased in aCP ($n=26$) in relation to pCP ($n=7$) ($p=0.0484$). Comparing gene expression of both transcription factors in aCP, SOX9 expression was also identified to be significantly increased in relation to SOX2 ($p < 0.0001$). However, neither SOX2 nor SOX9 gene expression showed significant differences in aCP ($p > 0.05$) in matters of gender (b) (female: $n=10$, male: $n=16$), invasiveness (c) (invasive: $n=11$, non-invasive: $n=11$) and age group (d) (pediatric: $n=9$, adult: $n=17$). All statistical analyses were performed using the two sided Mann-Whitney test. Error bars are used to indicate the distribution range of single values.