On-line Table: Studies published to date evaluating the performance of DWIMRI for the detection of rHNSCC[a]

	Vandecaveye et al[6]	Abdel Razek et al[7]	Gouhar et al[13]	Tshering Vogel et al[5]	Hwang et al[8]	Desouky et al[12]	Vaid et al[11,b]	Current Study
No. of rHNSCCs/total No. of patients	24/26[c]	19/30[d]	13/21	18/46	23/33	31/50[c]	44/80[d]	38/100
Prevalence of rHNSCC	92.30%	63.33%	61.90%	39.13%	69.69%	62.00%	55%	38.00%
No. of patients receiving various treatments	RX = 26	RTH = 12	RTH = 21	RX = 46	RX = 24	RTH = 1	RTH = 14	RTH = 52
		RX = 15			R0 = 9	RX = 40	RX = 51	RX = 48
		R0 = 3				R0 = 9	R0 = 15	
Reference standard and No. of patients/lesions	H = 26	H = 30	H = 21	H = 26	H = 19	H = 41	H = 58	H = 50
				F(12) = 28	F(22) = 14	F(12) = 9	F(18) = 22	F(25*) = 71
Comparison of DWI with morphologic MRI	Yes[e]	No	No	Yes[e]	No	No	No	Yes
Comparison of qualitative vs quantitative DWI	No	No	No	Yes	No	No	Yes	Yes
ADC threshold $\times 10^{-3}$ mm^2	1.30	1.30	1.16	1.30	1.46	0.96	1.20	1.22
Sensitivity (%)	94.6	84.0	85.0	67.0	89.5	100.0	90.13	92.1
Specificity (%)	95.9	90.0	88.0	86.0	84.8	74.0	82.5	95.4
Accuracy (%)	95.5	87.0	86.0	78.0	84.6	84.0	86.4	94.1
PPV (%)	90.9	94.0	92.0	75.0	89.5	70.4	84.4	92.1
NPV (%)	97.6	76.0	78.0	80.0	78.6	100	88.9	95.4
LR+	23.07[f]	8.4[f]	7.08[f]	4.7[f]	5.8[f]	3.84[f]	5.14[f]	19.9
LR−	0.05[f]	0.17[f]	0.17[f]	0.38[f]	0.125[f]	0[f]	1.2[f]	0.08

Note:—F indicates follow-up (mean/median* number of months in parentheses); H, histology; RTH, radiotherapy only; RX, radiotherapy ± chemotherapy + surgery; R0, no radiotherapy, surgery only; PPV, positive predictive value; NPV, negative predictive value.

[a] All studies used an EPI DWI technique with $b=0$ and $b=1000$.

[b] Study performed on a 3T MRI machine (all other studies on 1.5T MRI machines).

[c] Mix of local tumor recurrence and recurrent lymph nodes.

[d] Mix of rHNSCC and other histologic tumor types.

[e] Morphologic MRI and DWIMRI data provided, however no statistical comparison between the 2.

[f] LR+ and LR− were not provided by any of the authors but were calculated by us on the basis of the reported sensitivity and specificity. A test with LR+ > 10 and LR− < 0.1 is considered a good diagnostic test to rule in and rule out disease.
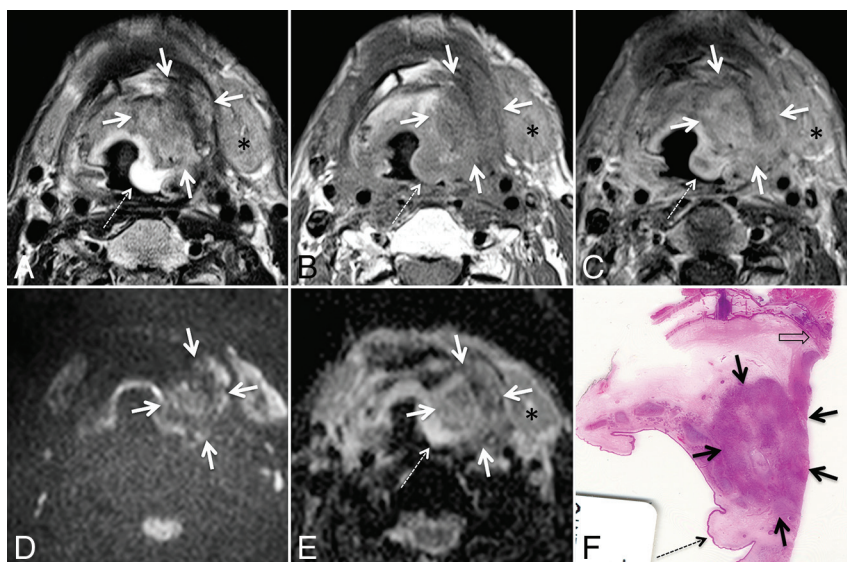
ON-LINE FIG 1. DWIMRI obtained 10 months after RTH for squamous cell carcinoma of the tonsil. The patient had increasing dysphagia. Axial T2 (A), T1 (B), and contrast-enhanced T1 (C) show an oval, poorly delineated mass (arrows) in the left pre-epiglottic and paraglottic space, with intermediate signal intensity on T2, low signal intensity on T1, and moderate contrast enhancement compatible with rHNSCC. Note invasion of the left hyoid bone, adjacent musculature, and absent cleavage plane between the tumor and the submandibular gland (asterisk). The dashed arrow indicates inflammatory edema with very high T2 signal, low T1 signal, and slightly stronger enhancement than the tumor. D, The $b=1000$ image shows moderately high signal intensity in the lesion (arrows). E, ADC map reveals low signal intensity (arrows), suggesting recurrence (ADCmean = 1.175×10^{-3} mm^2/s). Note that at visual analysis, the $b=1000$ signal intensity of this tumor is lower than the $b=1000$ signal intensity of the tumor shown in Fig 1. Endoscopic biopsy confirmed rHNSCC. F, Corresponding whole-organ histologic slice (H&E) shows rHNSCC (arrows) located beneath intact mucosa. The Dashed arrow indicates inflammatory edema. The block arrow indicates neoplastic invasion of the hyoid bone.
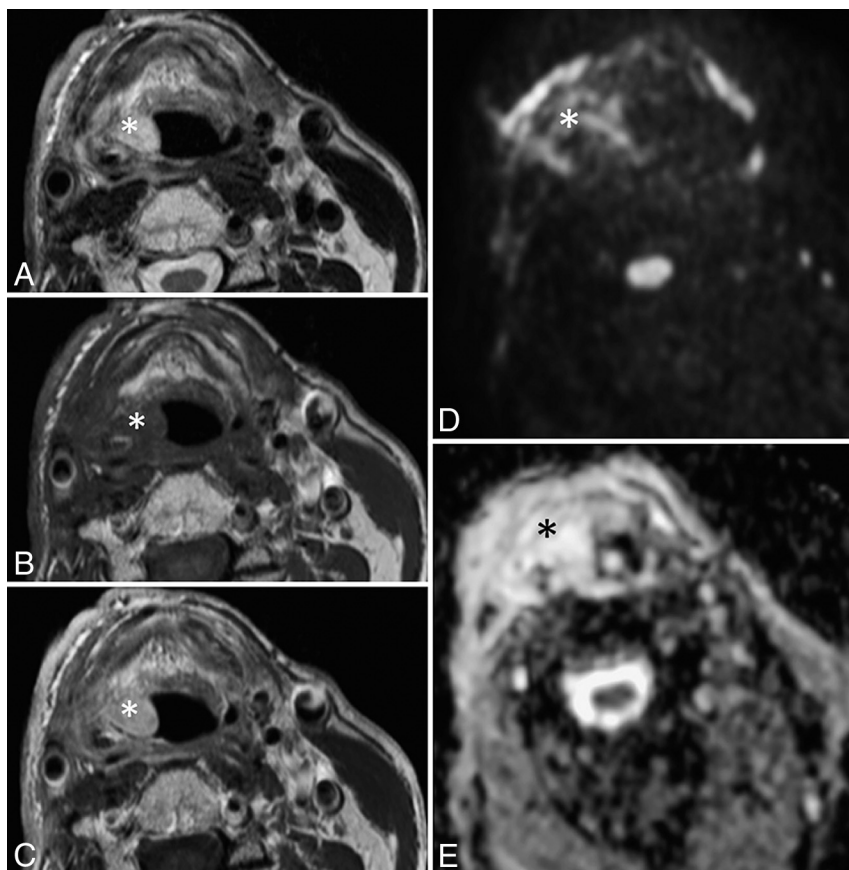
ON-LINE FIG 2. MRI obtained 60 months after RTH and radical neck dissection for squamous cell carcinoma of the tonsil. The patient has right reflex otalgia. Axial T2 (*A*), T1 (*B*), and contrast-enhanced T1 show an enlarged right aryepiglottic fold (*asterisks*) with high signal intensity on T2, low signal intensity on T1, and strong contrast enhancement, suggesting post-RTH edema. The *b*=1000 image (*C*) and ADC map (*D*) reveal no restriction of diffusion (*asterisks*), further supporting the diagnosis of inflammatory edema (ADCmean = 1.968×10^{-3} mm²/s). Follow-up at 28 months (not shown) showed no recurrence.
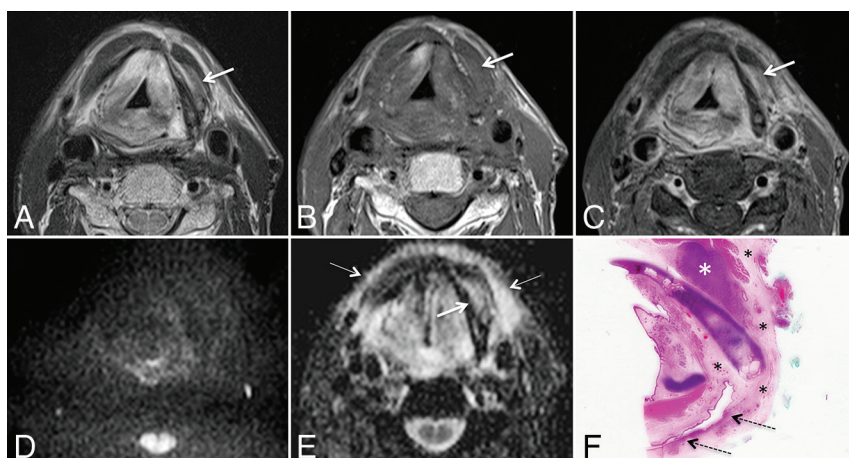
ON-LINE FIG 3. DWIMRI obtained 11 months after RTH for hypopharyngeal squamous cell carcinoma. The patient had left reflex otalgia and odynophagia. Axial T2 (*A*), T1 (*B*), and fat-saturated contrast-enhanced T1 (*C*) show a lenticular mass (*arrows*) in the left strap muscles with intermediate signal intensity on T2, low signal intensity on T1, and moderate enhancement, suggesting rHNSCC. The *b*=1000 image (*D*) shows no abnormal signal intensity. ADC map (*E*) reveals increased signal intensity in the left strap muscles (*arrow*) and in the anterior subcutaneous tissues (*thin arrows*). DWI was interpreted as indicating inflammatory edema (ADCmean strap muscles = 1.688×10^{-3} mm²/s). *F*, Corresponding whole-organ histologic slice (H&E) shows rHNSCC (*white asterisk*) in the left strap muscles detected by morphologic MRI but misinterpreted as inflammatory edema on DWI. *Dashed arrows* indicate an additional pT1 rHNSCC of the posterior hypopharyngeal wall missed by both MRI and DWI. *Black asterisks* indicate inflammatory edema at histology.