

Corrigendum on the article entitled, 'Thyroid Imaging Reporting and Data System (TIRADS) in Stratifying Risk of Thyroid Malignancy at The Medical City,' by Dy et al., published in JAFES Vol. 32. No. 2.

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Description of error and impact

After the publication of this article, an internal database tracking review revealed that raw data spreadsheet columns had been cross-linked non-synchronously across multiple tracking matrices. This compilation oversight led to an inaccurate initial division of benign versus malignant historical groups. The overall study size remains fixed at 149 adult patients.

The corrected distribution confirms 68 malignant cases (45.64%) and 81 benign cases (54.36%), rather than the previously reported 50 malignant (33.56%) and 99 benign (66.44%) cases. These baseline tracking shifts alter corresponding numerical risks, crude and adjusted odds ratios, diagnostic performance metric percentages, and matching 95% confidence intervals across the text, figures, and tables.

The core clinical conclusions are updated to reflect that TIRADS categories 3–5 did not reach independent statistical significance in multivariable logistic regression analyses. These adjustments do not affect the clinical utility of ultrasound monitoring protocols, nor do they alter the academic validity of the study.

Corrections to the abstract

- **Results:** "Among the 149 nodules examined, 50 (33.56%) were confirmed to be malignant via histopathology, while 99 (66.44%) were benign... solid composition adjusted OR 4.912... Risk of malignancy for TIRADS categories 3, 4a, 4b, 4c and 5 were 12.50%, 12.82%, 26.19%, 53.70% and 66.67%, respectively... Crude OR for 4a, 4b, 4c, 5 were 1.03, 2.48, 8.12, 14.0... Sensitivity 98.00%, Specificity 7.07%, PPV 34.75%, NPV 87.50%, Accuracy 53%" is corrected to **"Among the 149 nodules examined, 68 (45.64%) were malignant and 81 (54.36%) were benign. Solid composition was significantly associated with malignancy. The overall diagnostic indices were as follows: sensitivity 95.59% (95% CI**

87.64–99.08), specificity 7.41% (95% CI 2.77–15.43), PPV 46.43% (95% CI 37.97–55.05), NPV 66.67% (95% CI 29.93–92.51), positive LR 1.03 (95% CI 0.95–1.12), negative LR 0.60 (95% CI 0.15–2.29), and overall accuracy 47.65% (95% CI 39.41–55.98)."

- **Conclusion:** "Higher TIRADS classification is associated with higher risk of thyroid malignancy. TIRADS is a sensitive classification in recognizing patients with thyroid cancer." is corrected to **"TIRADS categories 3–5 were not significantly associated with malignancy on logistic regression analysis. While TIRADS demonstrated high sensitivity (96%), its very low specificity (7%) limits its ability to reliably distinguish malignant from benign nodules, indicating that it should be used cautiously and in conjunction with other diagnostic tools."**

Corrections to the main text

- **Study Population and Clinico-Demographic Characteristics:** "Among these, 50 (33.56%) had histopathologically confirmed malignant nodules, while 99 (66.44%) had benign lesions" is corrected to **"Among these, 68 (45.64%) had histopathologically confirmed malignant nodules, while 81 (54.36%) had benign lesions (Figure 1)."**
- **Factors associated with malignancy and risk by TIRADS category:** "Malignancy risks for TIRADS categories 3, 4a, 4b, 4c, and 5 were 12.50%, 12.82%, 26.19%, 53.70%, and 66.67%, respectively... Crude OR for 4a, 4b, 4c, 5 were: 1.03, 2.48, 8.12, 14.0..." is corrected to **"Malignancy risks for TIRADS categories 3, 4a, 4b, 4c, and 5 were 33.33%, 36.84%, 38.10%, 57.41%, and 66.67%, respectively (Table 3). The cORs comparing TIRADS categories 4a, 4b, 4c, and 5 to category 3 were 1.17 (95% CI 0.26–6.21), 1.23 (95% CI 0.28–6.48), 2.70 (95% CI 0.64–13.85), and 4.00 (95% CI 0.48–44.25), respectively. Despite this apparent increase in risk, the differences in TIRADS grading distribution between malignant and benign nodules were not statistically significant (all $p > 0.05$)."**
- **Diagnostic performance of TIRADS:** "On comparing TIRADS results and histopathology, we found that TIRADS 4a to 5 classes had approximately 98% sensitivity, 7.07% specificity, LR+ of 1.05, LR- of 0.28, PPV of 34.75%, NPV of 87.5%, and accuracy of 53%" is corrected to **"TIRADS categories 4a to 5 classified 93.96% of nodules, identifying 95.59% of malignant nodules but also labeling 92.59% of benign nodules**

as high risk (Table 4). Sensitivity was high at 95.59% (95% CI 87.64–99.08); however, specificity was low at 7.41% (95% CI 2.77–15.43). The PPV, NPV, and overall accuracy were 46.43%, 66.67%, and 47.65%, respectively. The likelihood ratios indicated limited clinical utility (positive LR 1.03; negative LR 0.60), suggesting that TIRADS alone poorly distinguishes benign from malignant nodules despite its high sensitivity.”

Corrections to figures and tables

- **Figure 1 flowchart:** The flowchart originally showed a cohort distribution of 99 benign cases and 50 malignant cases. This is corrected to display the updated stratification frequencies: Benign Histopathology total is 81 patients (TIRADS 3 (6 patients), TIRADS 4a (24 patients), TIRADS 4b (26 patients), TIRADS 4c (23 patients), TIRADS 5 (2 patients)); Malignant Histopathology total is 68 patients (TIRADS 3 (3 patients), TIRADS 4a (14 patients), TIRADS 4b (16 patients), TIRADS 4c (31 patients), TIRADS 5 (4 patients)).

- Tables 1 and 3 were removed.
- **Table 2.** Association of patient characteristics with malignancy at surgical histopathology (n = 149) corrected to: **Table 1.** Clinico-demographic profile of the patients (n = 149).

Table 1. Clinico-demographic profile of the patients (n = 149)

	CORRECTED				ORIGINAL			
	All (n = 149)	Benign (n = 81, 54.36%)	Malignant (n = 68, 45.64%)	p	Benign (n = 99)	Malignant (n = 50)	p	
	Median (IQR); Frequency (%)							
Age (years)	47 (36-59)	49 (36-59)	44.50 (35.75-57.25)	0.304	47.13 ± 12.91	46.46 ± 14.93	0.775	
<30	17 (11.41)	8 (9.88)	9 (13.24)	0.795	8 (8.08)	9 (18)		
30-39	34 (22.82)	16 (19.75)	18 (26.47)		26 (26.26)	8 (16)	0.040	
40-49	33 (22.15)	18 (22.22)	15 (22.06)		22 (22.22)	11 (22)	0.184	
50-59	33 (22.15)	21 (25.93)	12 (17.65)		22 (22.22)	11 (22)	0.184	
60-69	29 (19.46)	16 (19.75)	13 (19.12)		19 (19.19)	10 (20)	0.223	
≥70	3 (2.01)	2 (2.47)	1 (1.47)		2 (2.02)	1 (2)	0.538	
Sex				0.432			0.883	
Male	20 (13.42)	13 (16.05)	7 (10.29)		13 (13.13)	7 (14)		
Female	129 (86.58)	68 (83.95)	61 (89.71)		86 (86.87)	43 (86)		
Composition				<0.001			<0.001	
Solid	93 (62.42)	40 (49.38)	53 (77.94)		49 (49.49)	44 (88)		
Mixed	56 (37.58)	41 (50.62)	15 (22.06)		50 (50.51)	6 (12)		
Echogenicity				0.041				
Hyperechoic or isoechoic	53 (35.57)	33 (40.74)	20 (29.41)		41 (41.41)	12 (24)		
Hypoechoic	56 (37.58)	33 (40.74)	23 (33.82)		38 (38.38)	18 (36)	0.269	
Markedly hypoechoic	40 (26.85)	15 (18.52)	25 (36.76)		20 (20.20)	20 (40)	0.007	
Margins				0.141				
Well-circumscribed	60 (40.27)	34 (41.98)	26 (38.24)		48 (48.48)	13 (26)		
Microlobulated	37 (24.83)	24 (29.63)	13 (19.12)		26 (26.26)	10 (20)	0.471	
Irregular	52 (34.90)	23 (28.40)	29 (42.65)		25 (25.25)	27 (54)	0.001	
Calcifications				0.011				
Microcalcifications	36 (24.16)	19 (23.46)	17 (25.00)		20 (20.20)	16 (32)		
Macrocalcifications	29 (19.46)	9 (11.11)	20 (29.41)		13 (13.13)	16 (32)	0.391	
None	84 (56.38)	53 (65.43)	31 (45.59)		66 (66.67)	18 (36)	0.012	
Shape				0.254				
Wider than tall	123 (82.55)	70 (86.42)	53 (77.94)		86 (86.87)	37 (74)		
Taller than wide	26 (17.45)	11 (13.58)	15 (22.06)		13 (13.13)	13 (26)	0.055	
TIRADS Category				0.150				
3	9 (6.04)	6 (7.41)	3 (4.41)					
4a	38 (25.50)	24 (29.63)	14 (20.59)					
4b	42 (28.19)	26 (32.10)	16 (23.53)					
4c	54 (36.24)	23 (28.40)	31 (45.59)					
5	6 (4.03)	2 (2.47)	4 (5.88)					
Bethesda classification				<0.001				
I	13 (8.72)	11 (13.58)	2 (2.94)		82 (82.83)	13 (26)		
II	82 (55.03)	56 (69.14)	26 (38.24)					
III	12 (8.05)	4 (4.94)	8 (11.76)		5 (5.05)	7 (14)	0.001	
IV	11 (7.38)	7 (8.64)	4 (5.88)		9 (9.09)	2 (4)	0.687	
V	27 (18.12)	3 (3.70)	24 (35.29)		3 (3.03)	24 (48)	<0.001	
VI	4 (2.68)	0	4 (5.88)		0	4 (8)		
Dimensions								
CC	2.67 (1.74-3.80)	3.09 (1.88-4.11)	2.14 (1.63-3.51)	0.008	3.06 ± 1.39	2.49 ± 1.20	0.016	
W	1.94 (1.34-2.98)	2.29 (1.51-3.20)	1.66 (1.16-2.33)	0.008	2.34 ± 1.20	1.88 ± 0.98	0.023	
AP	1.61 (1.06-2.46)	1.80 (1.19-2.69)	1.44 (1.00-2.01)	0.100	1.86 ± 0.95	1.66 ± 0.87	0.215	

- Table 4. Clinical features associated with malignant thyroid nodules at surgical pathology (n = 149) corrected to: **Table 2.**
- Table 5. TIRADS categories and risk of malignancy of patients who underwent thyroidectomy (n = 149) corrected to: **Table 3.**

Table 2. Clinical features associated with malignant thyroid nodules at surgical pathology (n = 149)

	CORRECTED				ORIGINAL		
	cOR (95% CI)	p	aOR (95% CI)	p	aOR	95% CI	p-value
Age (years)	0.99 (0.96-1.01)	0.311					
<30	reference	-	reference	-	(reference)	-	-
30-39	1.00 (0.31-3.23)	>0.999	1.60 (0.39-6.96)	0.516	0.2823	0.0402 to 1.9818	0.203
40-49	0.74 (0.22-2.40)	0.616	0.86 (0.20-3.82)	0.845	0.4061	0.0612 to 2.6961	0.351
50-59	0.51 (0.15-1.66)	0.264	0.53 (0.11-2.54)	0.419	0.4125	0.0606 to 2.8058	0.365
60-69	0.72 (0.21-2.40)	0.595	0.40 (0.08-1.91)	0.253	0.1135	0.0146 to 0.8849	0.038
≥70	0.44 (0.02-5.53)	0.538	0.23 (0.00-5.34)	0.413	0.1076	0.0009 to 12.5138	0.358
Sex							
Female	reference	-	reference	-			
Male	0.60 (0.21-1.56)	0.308	0.29 (0.07-1.05)	0.059	0.6446	0.1113 to 3.7339	0.624
Composition							
Mixed	reference	-	reference	-			
Solid	3.62 (1.79-7.61)	<0.001	2.14 (0.90-5.26)	0.084	4.9122	1.3257 to 18.2011	0.017
Echogenicity							
Hyperechoic or isoechoic	reference	-	reference	-	reference	-	-
Hypoechoic	1.15 (0.53-2.50)	0.722	1.21 (0.49-3.08)	0.676	1.9757	0.6069 to 6.4319	0.258
Markedly hypoechoic	2.75 (1.19-6.54)	0.019	3.48 (1.16-11.47)	0.026	3.6708	0.8463 to 15.9214	0.082
Margins							
Well-circumscribed	reference	-	reference	-	reference	-	-
Microlobulated	0.71 (0.30-1.64)	0.425	0.77 (0.29-1.96)	0.582	2.0423	0.5823 to 7.1637	0.265
Irregular	1.65 (0.78- 3.51)	0.190	0.63 (0.23-1.67)	0.361	1.6792	0.4940 to 5.7073	0.406
Calcifications							
None	reference	-					
Microcalcifications	2.48 (0.91-7.14)	0.081					
Macrocalcifications	0.65 (0.30-1.45)	0.292					
Shape							
Wider than tall	reference	-					
Taller than wide	1.80 (0.77-4.33)	0.178					
Bethesda classification							
I or II	reference	-	reference	-	reference	-	-
III	4.47 (1.36-16.64)	0.013	4.04 (1.07-17.68)	0.039	7.4988	1.5572 to 36.1108	0.012
IV	1.42 (0.38-4.84)	0.586	1.78 (0.44-6.88)	0.405	1.9548	0.3329 to 11.4788	0.458
V	16.58 (5.56-65.78)	<0.001	13.95 (4.11-63.61)	<0.001	36.7881	8.1908 to 165.2305	<0.0001
VI	21.32 (2.17-2859.90)	0.006	17.42 (1.31-2510.29)	0.028	-	-	-
Dimensions							
CC	0.69 (0.53-0.89)	0.005					
W	0.65 (0.47-0.88)	0.007					
AP	0.72 (0.49-1.02)	0.071					

Table 3. TIRADS categories and risk of malignancy of patients who underwent thyroidectomy (n = 149)

TIRADS Category	CORRECTED					ORIGINAL				
	Histopathology		Risk of Malignancy (%)	cOR (95% CI)	p	Histopathology		Risk of Malignancy (%)	cOR (95% CI)	p
	Benign (n = 81)	Malignant (n = 68)				Benign (n = 99)	Malignant (n = 50)			
3	6/9	3/9	33.33%	reference	-	7/8	1/8	12.50%	reference	-
4a	24/38	14/38	36.84%	1.17 (0.26-6.21)	0.844	34/39	5/39	12.82%	1.03 (0.10 to 10.23)	0.980
4b	26/42	16/42	38.10%	1.23 (0.28-6.48)	0.789	31/42	11/42	38.10%	2.48 (0.27 to 22.54)	0.419
4c	23/54	31/54	57.41%	2.70 (0.64-13.85)	0.191	25/54	29/54	57.41%	8.12 (0.93 to 70.59)	0.059
5	2/6	4/6	66.67%	4.00 (0.48-44.25)	0.215	2/6	4/6	66.67%	14 (0.94 to 207.60)	0.055

Table 4. Accuracy of TIRADS in predicting a malignant thyroid nodule (n = 149)

TIRADS	CORRECTED			TIRADS	ORIGINAL		
	Malignant (n = 68)	Benign (n = 81)	Total		Malignant (n = 50)	Benign (n = 99)	Total
	Frequency (%)						
TIRADS 4 to 5	65 (95.59)	75 (92.59)	140 (93.96)	TIRADS 4 to 5	49 (98)	92 (92.93)	141 (94.63)
TIRADS 3	3 (4.41)	6 (7.41)	9 (6.04)	TIRADS 3	1 (2)	7 (7.07)	8 (5.37)
Total	68 (100)	81 (100)		Total	50 (100)	99 (100)	149 (100)
Sensitivity	95.59	Positive LR	1.03	Sensitivity	98	Positive LR	1.05
(%, 95% CI)	(87.64, 99.08)	(LR, 95% CI)	(0.95, 1.12)		(89.35-99.95)		(0.99 to 1.13)
Specificity	7.41	Negative LR	0.60	Specificity	7.07	Negative LR	0.28
(%, 95% CI)	(2.77, 15.43)	(LR, 95% CI)	(0.15, 2.29)		(2.89 to 14.03)		(0.04 to 2.24)
PPV (%, 95% CI)	46.43	Accuracy	47.65	PPV	34.75	Accuracy	53%
	(37.97, 55.05)	(%, 95% CI)	(39.41, 55.98)		(33.24 to 36.29)		
NPV (%, 95% CI)	66.67			NPV	87.5		
	(29.93, 92.51)				(46.96 to 98.23)		

- Table 6. Accuracy of TIRADS in predicting a malignant thyroid nodule (n = 149) corrected to: **Table 4.**

Corrections to the References

The reference list is corrected from 26 to 18 entries. The following eight references were removed:

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