Comparison between PET-CT and CT in the diagnosis of recurrence of adrenocortical carcinoma.

C. Massaglia[1], A. Ardito[1], B. Zaggia[1], V. Basile[1], F. Daffara[1], E. Pelosi[2], V. Arena[2], D. Penna[2], M. Terzolo[1]

[1] Internal Medicine I, San Luigi Gonzaga Hospital, University of Turin; [2] IRMET PET-CT Diagnostic Imaging Center, Turin; Italy.

BACKGROUND

Adrenocortical carcinoma (ACC) is a rare tumor characterized by a high rate of recurrence even after radical surgery. Surgery of recurrent ACC may increase survival; thus, it is mandatory a timely detection of recurrence and an accurate assessment of disease burden, either to increase the chance of radical extirpation or to avoid unnecessary surgery.

AIM OF THE STUDY

To assess the accuracy of FDG-PET/CT to diagnose ACC recurrence in a real world setting in the follow-up of patients radically operated on.

PATIENTS & METHODS

A retrospective evaluation from 1998 to 2012 at San Luigi Hospital of Orbassano, Italy.

- **57 patients** affected by ACC who have undergone radical surgery with a suspected recurrence based on CT findings, who did a FDG PET-CT scan[a].
- Recurrence **confirmed by pathology** (23), **fine-needle biopsy** (5), or detection of unequivocal tumor **progression** at follow-up (29).

[a] PET-CT tomography: Discovery ST – General Electric medical systems, Waukesha, Wisconsin, USA.
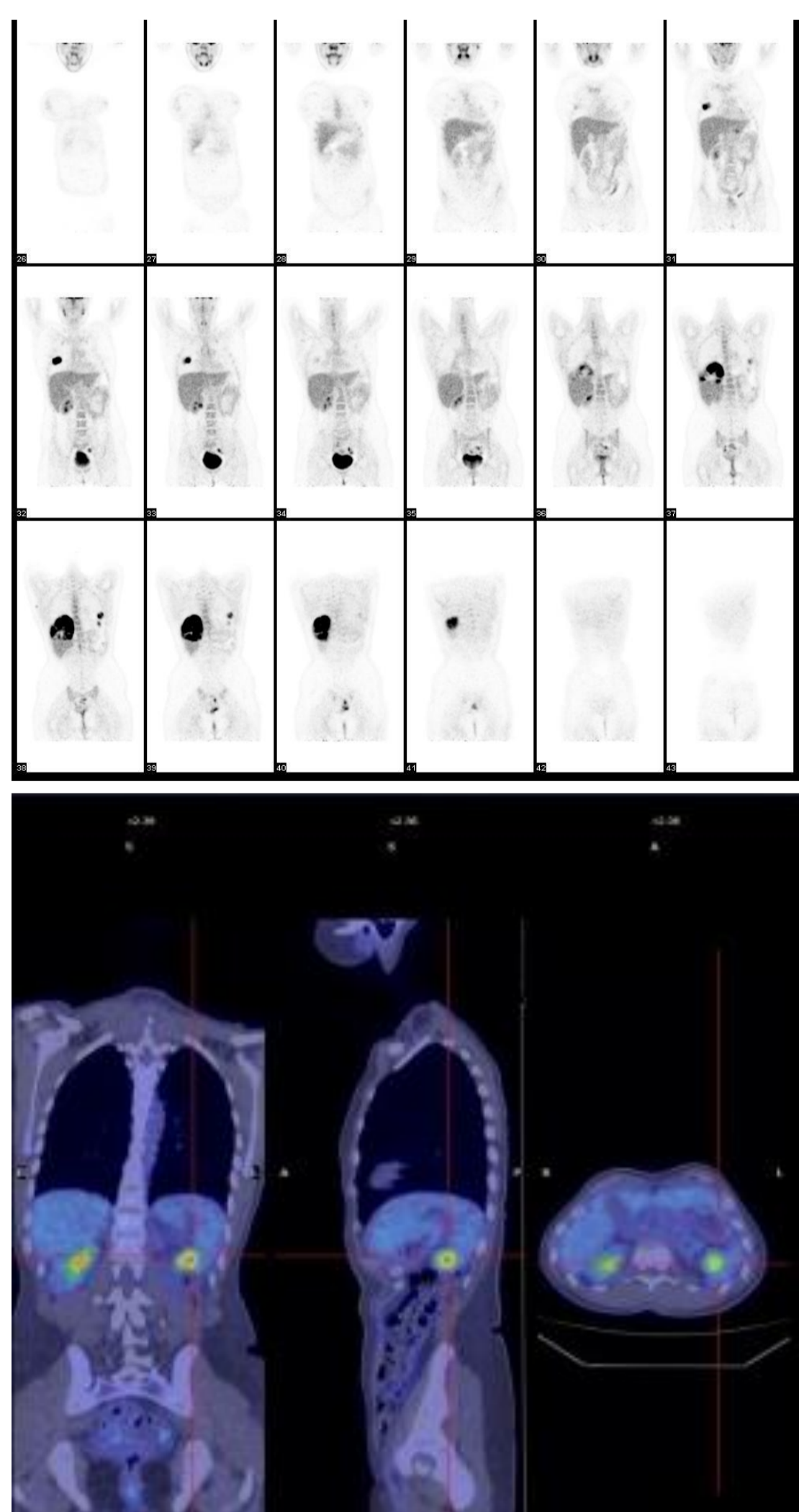
	CT				FDG PET-CT			
	TP	FP	TN	FN	TP	FP	TN	FN
Liver	16	4	33	4	10	0	37	10
Adrenal loggia	21	2	31	3	19	2	31	5
Abdomen	16	2	34	5	15	0	36	6
Thorax	13	4	38	2	8	2	40	7
Bones/other	6	1	49	1	6	1	49	1

Table 1 - Analysis *per patient* (n=57) with tumor lesions detected by CT and PET compared with the gold standard (histopathology or unequivocal evidence of progression) *(TP = True Positive, FP = False Positive, TN = True Negative, FN = False Negative)*

RESULTS

- For **liver lesions**, **PET-CT** showed a **significantly higher diagnostic accuracy** (sensitivity, CT 80% vs. PET 50%, p = 0.046; specificity, CT 89% vs. PET 99%, p = 0.057).
- In the **local abdominal** and **bone recurrences** the two tests have **similar diagnostic accuracy**.
- For **lung lesions,** PET-CT had **lower sensitivity but better specificity.**
- No significant correlation was observed between **SUV values** and the Ki 67 value, number of mitosis, presence of secretion, adiuvant therapy with mitotane.
- In 18 patients (33%), PET-CT findings changed the **therapeutic strategy** suggested by CT.

In 10 patients, PET ruled out the suspicion of recurrence (liver focal nodular hyperplasia, non-neoplastic pulmonary nodules); in 1 case with multiple possible tumor sites, PET showed that ACC recurrence was amenable of surgical removal (surgery with R0 resection); in 2 cases, PET showed additional lesions to CT that were amenable of surgical removal; in 4 cases PET showed inoperable disease, thus patients received systemic treatment.


	Liver		Adrenal loggia		Abdomen		Thorax		Bone & other sites	
	TC	PET-CT	TC	PET-CT	TC	PET-CT	TC	PET-CT	TC	PET-CT
Sensitivity*	0.80	0.50	0.87	0.79	0.76	0.70	0.86	0.53	0.86	0.86
Confidence Interval	0.58/0.92	0.30/0.70	0.69/0.96	0.60/0.91	0.55/0.89	0.50/0.85	0.62/0.96	0.30/0.75	0.49/0.97	0.49/0.97
Specificity**	0.89	0.99	0.94	0.94	0.94	0.99	0.90	0.95	0.98	0.98
Confidence Interval	0.75/0.96	0.89/1.0	0.80/0.98	0.80/0.98	0.82/0.99	0.88/ 1.0	0.78/0.96	0.84/0.99	0.90/1.0	0.90/1.0
Diagnostic Accuracy	0.86	0.82	0.93	0.89	0.88	0.89	0.89	0.84	0.96	0.96
PPV	0.80	0.95	0.91	0.91	0.89	0.97	0.76	0.80	0.86	0.86
Confidence Interval	0.58/0.92	0.68/1.0	0.73/0.98	0.71/0.97	0.67/ 0.97	0.76/ 1.0	0.53/0.90	0.49/0.94	0.49/0.97	0.49/0.97
NPV	0.89	0.78	0.91	0.86	0.87	0.85	0.95	0.85	0.98	0.98
Confidence Interval	0.75/0.96	0.65/0.88	0.77/0.97	0.71/0.94	0.73/0.94	0.71/ 0.93	0.84/0.99	0.72/0.93	0.90/ 1.0	0.90/ 1.0
LR+	7.40	38.0	14.44	13.06	13.71	52.14	9.10	11.2	42.86	42.86
Confidence Interval	2.9/19.2	2.3/616.5	3.7/55.8	3.4/50.8	3.5/53.9	3.3/828.9	3.5/23.6	2.7/46.9	6.0/0.9	6.0/0.9
LR-	0.22	0.51	0.13	0.22	0.25	0.30	0.15	0.49	0.15	0.15
Confidence Interval	0.09/0.54	0.33/0.78	0.05/0.39	0.10/0.49	0.12/0.54	0.16/0.57	0.04/ 0.54	0.28/0.85	0.03/0.90	0.03/0.90
*p-value (Fischer/*Chisquare)	p = 0.0467*		p = 0.3504		p = 0.5000		p = 0.0543		p = 0.7692	
**p-value(Fischer)	p = 0.0574		p = 0.6934		p = 0.2465		p = 0.3379		p = 0.7525	

Table 2 - Statistic analysis of the diagnostic performance of CT and FDG-PET CT
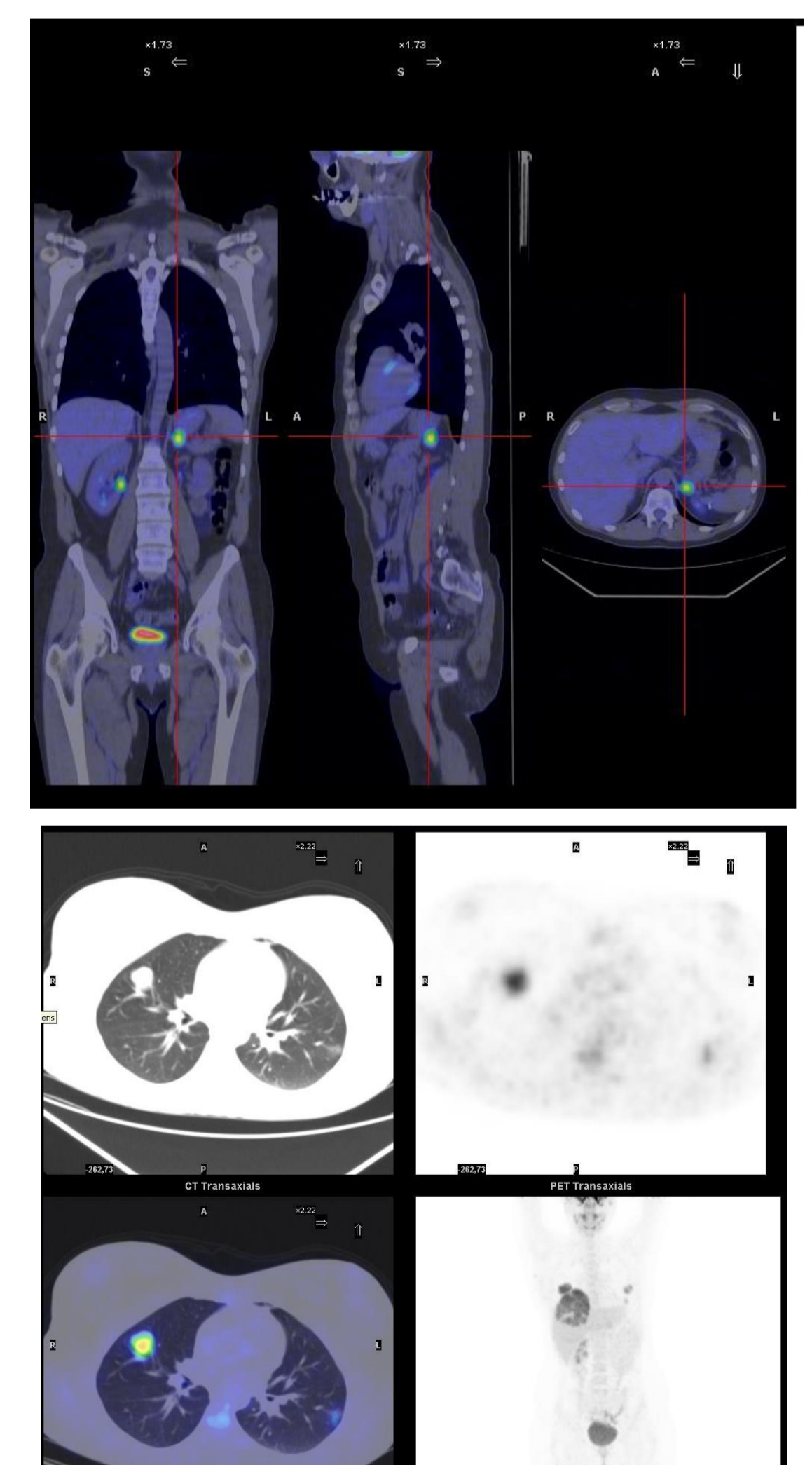
CONCLUSION

FDG PET-CT can be considered an useful adjunct to CT for the diagnosis of ACC recurrence, increasing the diagnostic accuracy for suspected liver or abdominal recurrences, and improving the identification of occult or multiple tumor lesions.

Use of PET-CT may have important clinical implications, allowing a better selection of patients for surgery with radical intent.

ECE 2015
16–20 May 2015
DUBLIN, IRELAND
17TH EUROPEAN CONGRESS OF ENDOCRINOLOGY

5-GP-02

Adrenal
MASSIMO TERZOLO

Poster presented at: ECE 2015 16–20 May 2015 DUBLIN, IRELAND

DOI: 10.3252/pso.eu.17ece.2015

PosterSessionOnline.com

17 ECE