Imaging Molecolare in Uro-Oncologia: quando e quale?

Rimini
18 Maggio 2013

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Quando?

- Diagnosi
- Stadiazione
- Ristadiazione
- Piano di trattamento RT
- Terapia sistemica

- Prospettive future

Quale?

Molecular imaging of prostate cancer

Josef J. Fox, Heiko Schöder, and Steven M. Larson

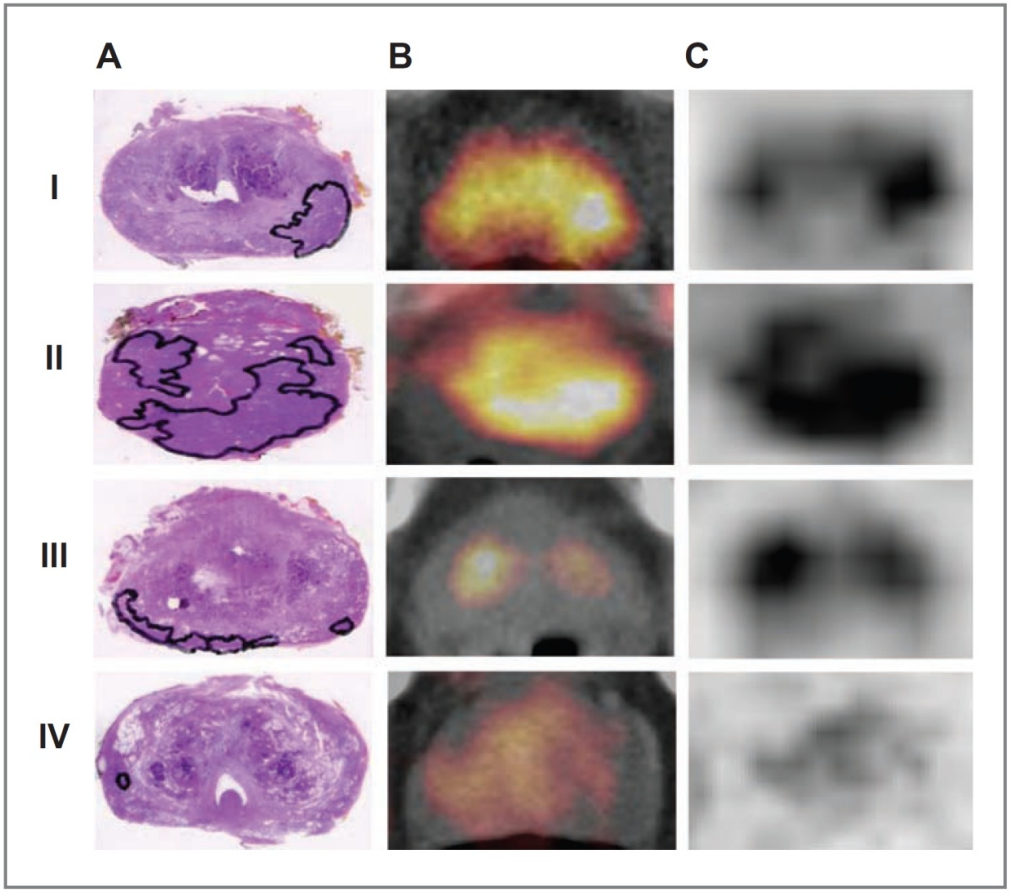
Tracer	Isotope half-life	Mechanism
F18-FDG	110 min	Analog of glucose; reflects the increased glycolytic activity of tumors (Warburg effect); FDG is trapped in cells via GLUT transport and irreversible HK phosphorylation
C11-Choline	20 min	Substrate for phospholipid synthesis in cell membranes, transmembrane signaling, lipid and cholesterol transport and metabolism; choline kinase is upregulated in tumors
F18-Choline	110 min	Same as for C11-choline
C11-Methionine	20 min	Naturally occurring amino acid; reflects increased amino acid transport, to a lesser degree also protein synthesis related to tumor cell proliferation and turnover
C11-Acetate	20 min	Naturally occurring metabolite; converted to acetyl-CoA and incorporated into cholesterol and fatty acids; fatty acid synthetase and acetyl-CoA carboxylase are oncogenic enzymes upregulated in prostate cancer
F18-FACBC	110 min	Synthetic l-leucine analog; reflects increased amino acid transport as prerequisite for protein synthesis
Sodium F18-Fluoride	110 min	Reflects increased osteoblastic activity by slow exchange of fluoride ions with hydroxyapatite crystals, forming fluoroapatite
F18-FDHT	110 min	Androgen receptor expression and binding capacity; AR is upregulated in castrate resistant disease
Zr89-DFO-huJ591	78.4 h	Monoclonal antibody to epitope on external domain of PSMA

Diagnosi

Author	Tracer	Pts (n)	Sensitivity (%)	Specificity (%)
Kotzerke (2000)	11C-Chol	23	100	-
De Jong (2002)	11C-Chol	25	100	-
Sutinen (2004)	11C-Chol	14	100	-
Yamaguchi (2005)	11C-Chol	20	100	-
Kwee (2005)	18F-Chol	17	100	-
Schmid (2005)	18F-Chol	19	100	-
Yoshida (2005)	11C-Chol	13	-	-
Farsad (2005)*	11C-Chol	36	66	81
Kwee (2006)	18F-Chol	26	100	-
Reske (2006)*	11C-Chol	26	100	-
Martorana (2006)*	11C-Chol	43	66	84
Scher (2007)	11C-Chol	58	86	70
Husarik (2008)	18F-Chol	43	98	-
Giovacchini (2008)*	11C-Chol	19	72	43
Li (2008)*	11C-Chol	49	90	86
Watanabe (2010)	11C-Chol	43	73	59
Souvatzoglou (2011)*	11C-Chol	43	79	-

Farsad et al. Q J Nucl Med Mol Imaging 2012

Diagnosi



PET/CT Colina dipende dalla configurazione del tumore

I: monofocale

II: multifocale

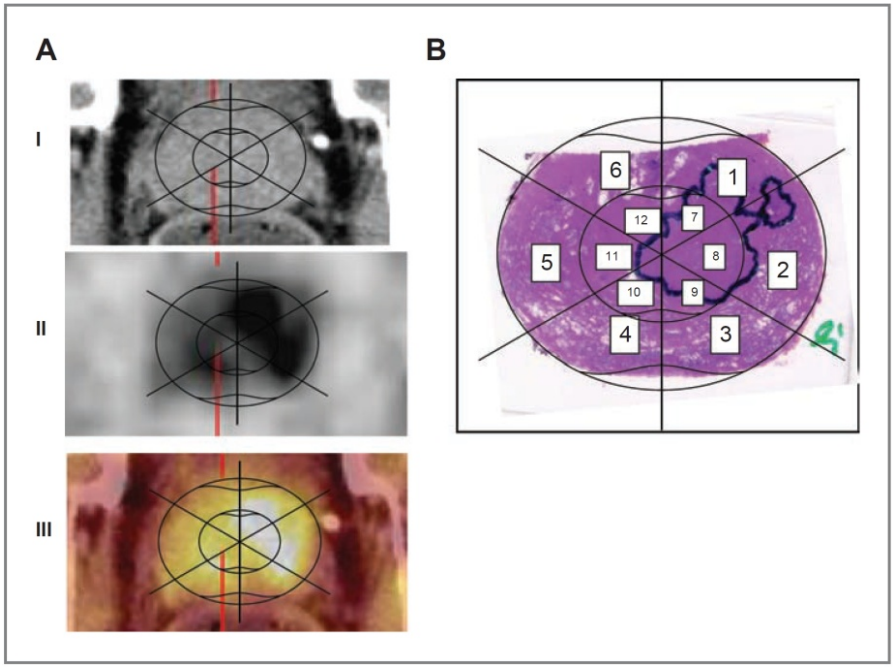
III: ad anello

IV: <5mm

Sensibilità 79%

Souvaloutzoglou et al. CCR, 2011

Diagnosi



	n	$SUV_{max} \pm SD$	SUV_{max} (median)
Normal	454	4.4 ± 1.5	4.2
PCa	86	5.7 ± 3.3	4.9
BPH	1,004	4.6 ± 1.5	4.5
Prostatitis	95	4.1 ± 1.3	3.9
HGPIN	2	–	–

Comparison of SUV_{max}	P^a
PCa vs. normal	0.012
PCa vs. prostatitis	0.054
PCa vs. BPH	0.102
BPH vs. normal	0.042
BPH vs. prostatitis	>0.99
Prostatitis vs. normal	>0.99

[a]Bonferroni corrected.

43 pz
2526 segmenti analizzati

Souvaloutzoglou et al. CCR, 2011

Stadiazione

- T
  - Cho-PET/CT
- N
  - Cho-PET/CT
  - Acetate-PET/CT
- M
  - Scintigrafia ossea
  - Fluoride PET/CT
  - Cho-PET/CT

Stadiazione – T N

Urologic Oncology: Seminars and Original Investigations xx (2011) xxx

Imaging of prostate cancer with PET/CT and radioactively labeled choline derivates

Bernd Joachim Krause, M.D.[a], Michael Souvatzoglou, M.D.[a], Uwe Treiber, M.D.[b,*]

Diagnostic efficacy of ^{18}F- and ^{11}C-choline PET and PET/CT in patients with primary prostate cancer

Tracer	Ref.	Author	Year	Modus	Pts. (*n*)	Local tumor		Lymph nodes	
						Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)
^{18}F-FCH	[26]	Kwee	2005	PET	17	100	—	—	—
	[31]	Schmid	2005	PET/CT	19	100	—	—	—
	[27]	Kwee	2006	PET	26	100	—	—	—
	[54]	Husarik	2008	PET/CT	43	98	—	33	100
^{11}C-Cho	[6]	Kotzerke	2000	PET	23	100	—	50	90
	[23]	de Jong	2002	PET	25	100	—	80	95
	[35]	de Jong	2003	PET	67	—	—	80	96
	[32]	Sutinen	2004	PET	14	100	—	—	—
	[33]	Yamaguchi	2005	PET	20	100	—	—	—
	[34]	Yoshida	2005	PET	13	—	—	—	—
	[24]	Farsad*	2005	PET/CT	36	66	81	—	—
	[29]	Reske*	2006	PET/CT	26	100	—	—	—
	[30]	Scher	2007	PET/CT	58	86	70	—	—
	[28]	Martorana*	2006	PET/CT	43	66	84	—	—
	[25]	Giovacchini*	2008	PET/CT	19	72	43	—	—
	[36]	Schiavina	2008	PET/CT	57	—	—	60	98
	[66]	Li†	2008	PET/CT	49	90	86	—	—
Sum					555				
Mean						91	73	61	96
Median						100	81	60	96

FCH = fluoromethylcholine; Cho = choline.

* Sextant-based comparison with histology.

† Uptake ratio of lesion to muscle is compared with histology.

Stadiazione – N

^{11}C-Choline Positron Emission Tomography/Computerized Tomography for Preoperative Lymph-Node Staging in Intermediate-Risk and High-Risk Prostate Cancer: Comparison with Clinical Staging Nomograms

Schiavina

EUROPEAN UROLOGY 54 (2008) 392–401

Table 4 – Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and number of correctly recognized cases with positron emission tomography/computerized tomography (PET/CT) in the detection of lymph node metastases (LNMs)

	Sensitivity	Specificity	PPV	NPV	No. correctly recognized cases
Patient analysis ($n = 57$)	60.0% (9 of 15)	97.6% (41 of 42)	90.0% (9 of 10)	87.2% (42 of 48)	87.7% (50 of 57)
Node analysis ($n = 892$)	41.4% (17 of 41)	99.8% (850 of 851)	94.4% (17 of 18)	97.2% (851 of 875)	97.1% (867 of 892)

Diameter of metastatic deposit (mm) (No. of LNs)	Detection rate of PET/CT
0.1–1.9 ($n = 6$)	0 (0%)
2–4.9 ($n = 10$)	3 (30%)
5–9.9 ($n = 16$)	7 (43%)
>10 ($n = 9$)	7 (77%)
Total ($n = 41$)	17 (41%)

Stadiazione – N

^{18}F Choline PET/CT in the Preoperative Staging of Prostate Cancer in Patients with Intermediate or High Risk of Extracapsular Disease: A Prospective Study of 130 Patients[1]

Mohsen Beheshti, MD

Radiology: Volume 254: Number 3—March 2010

Performance of FCH PET/CT in the Detection of Malignant LNs

LN Diameter	Total No. of Findings	No. of True-Positive Findings	No. of True-Negative Findings	No. of False-Negative Findings	No. of False-Positive Findings	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)	Negative Predictive Value (%)
≥5.0 mm	130	18	99	9	4	66	96	82	92
Overall	130	18	86	22	4	45	96	82	83

22/130 pts (38 LNs) PET was **FN** (16.9%):
10 micrometastasis (≤2mm)
3 tumour size 2-5mm
9 tumour size >5mm

4/130 pts PET was **FP** (3%):
1 sinus histiocytosis
3 reactive LNs

TP LNs diameter 15.6mm; **FN** LNs diameter 4.0mm (*p .0001*)

Stadiazione – N

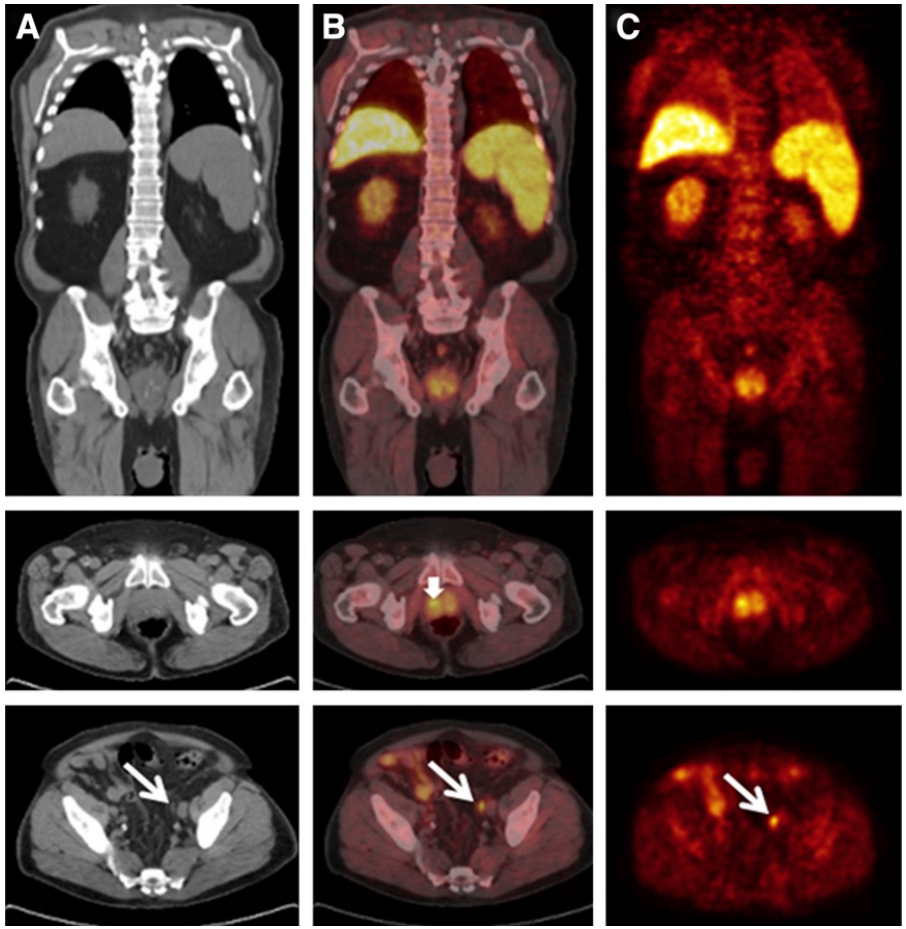
Nucl Med 2013; 54:699–706

^{11}C-Acetate PET/CT Before Radical Prostatectomy Nodal Staging and Treatment Failure Prediction

Mohammed Haseebuddin

107 pts with intermediate- or high-risk localized prostate cancer

Sensitivity	68.0%
Specificity	78.1%
PPV	48.6%
NPV	88.9%



Stadiazione – M

EUROPEAN UROLOGY 59 (2011) 61–71

Guidelines

EAU Guidelines on Prostate Cancer. Part 1: Screening, Diagnosis, and Treatment of Clinically Localised Disease

Axel Heidenreich

Table 3 – Guidelines for staging of prostate cancer

		GR
1	Local staging (T staging) of PCa is based on findings from DRE and possibly MRI. Further information is provided by the number and sites of positive prostate biopsies, the tumour grade, and the level of serum PSA.	C
	Despite its high specificity in the evaluation of ECE and SVI, TRUS is limited by poor contrast resolution, resulting in low sensitivity and the tendency to understage PCa. Even with the advent of colour and power Doppler to assist in identifying tumour vascularity, the accuracy of TRUS in local staging remains inadequate. In comparison with DRE, TRUS, and CT, MRI demonstrates higher accuracy for the assessment of uni- or bilobar disease (T2), ECE and SVI (T3), as well as the invasion of adjacent structures (T4). However, the literature shows a wide range in the accuracy of T staging by MRI, from 50% to 92%. The addition of DCE-MRI can be helpful in equivocal cases. The addition of MRSI to MRI also increases accuracy and decreases interobserver variability in the evaluation of ECE [33,34].	C
2	Lymph node status (N staging) is only important when potentially curative treatment is planned. Patients with stage T2 or less, PSA < 10 ng/ml, a Gleason score ≤6, and <50% positive biopsy cores have <10% likelihood of having node metastases and can be spared nodal evaluation.	
	Given the significant limitations of preoperative imaging in the detection of small metastases (<5 mm), pelvic lymph node dissection remains the only reliable staging method in clinically localised PCa.	B
	Currently, it seems that only methods of histologic detection of lymph node metastases with high sensitivity, such as sentinel lymph node dissection or extended pelvic lymph node dissection, are suitable for lymph node staging in PCa.	C
3	Skeletal metastasis (M staging) is best assessed by bone scan. This may not be indicated in asymptomatic patients if the serum PSA level is <20 ng/ml in the presence of well-differentiated or moderately differentiated tumours.	B
	In equivocal cases, 18F-fluorodeoxyglucose-PET or PET/CT could be of value, especially to differentiate active metastases and healing bones.	C

CT = computed tomography; DCE-MRI = dynamic contrast-enhanced MRI; DRE = digital rectal examination; ECE = extracapsular extension; GR = grade of recommendation; MRI = magnetic resonance imaging; MRSI = magnetic resonance spectroscopic imaging; PCa = prostate cancer; PET = positron emission tomography; PSA = prostate-specific antigen; SVI = seminal vesicle invasion; TRUS = transrectal ultrasound.

Stadiazione – M

^{18}F Choline PET/CT in the Preoperative Staging of Prostate Cancer in Patients with Intermediate or High Risk of Extracapsular Disease: A Prospective Study of 130 Patients[1]

Mohsen Beheshti, MD

Radiology: Volume 254: Number 3—March 2010

- 43 metastatic bone lesions in 13 of 130 patients:
  - 1 intermediate-risk
  - 12 high-risk patients

- As a result of early bone marrow infiltration in 2/13 patients, only FCH PET was positive

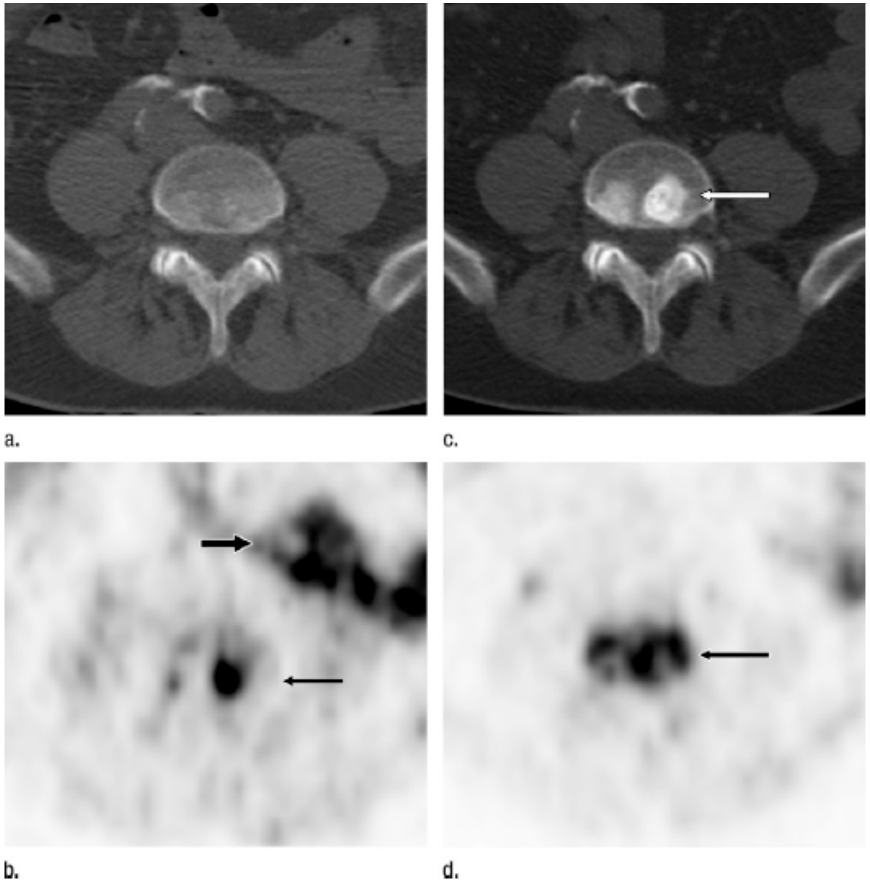


Figure 3: Images obtained in a 73-year-old patient with prostate cancer (Gleason score, seven; PSA level, 5.6 ng/mL [5.6 μg/L]) with clinical evidence of disease progression 4 months after radiation therapy and with an increase in PSA level from 0.25 ng/mL [0.25 μg/L] to 3.8 ng/mL [3.8 μg/L]. **(a)** The CT portion of an FCH PET/CT image obtained at the L4 vertebra level shows no substantial morphologic change concerning bone metastasis. **(b)** FCH PET image shows abnormal focal increased tracer uptake (long arrow) at the L4 vertebra level, probably because of bone marrow metastasis, as well as nonspecific bowel tracer uptake (short arrow). **(c)** The CT portion of an FCH PET/CT image obtained at 6-month follow-up enabled us to confirm the bone metastasis at the L4 vertebra level (arrow). **(d)** FCH PET image obtained at 6-month follow-up shows hyperactive metastatic bone lesions (arrow) at the L4 vertebra level.

Ristadiazione

Urologic Oncology: Seminars and Original Investigations xx (2011) xxx

Imaging of prostate cancer with PET/CT and radioactively labeled choline derivates

Bernd Joachim Krause, M.D.[a], Michael Souvatzoglou, M.D.[a], Uwe Treiber, M.D.[b,*]

Diagnostic efficacy of ^{18}F- and ^{11}C-choline PET and PET/CT in patients with recurrent prostate cancer

Tracer	Ref.	Author	Year	Pts. (*n*) All	Pts. (*n*) RP	Pts. (*n*) RT	Pts. (*n*) ADT	Time (Mo) Tx-PET/CT	PSA (ng/ml)	Sensitivity (%)	Specificity (%)	Localization
^{18}F-FCH	[53]	Heinisch	2006	34	31	3	4	—	17.1	41	—	LR, LNM, BM
	[31]	Schmid	2005	9	8	1	—	49	14.1	100	—	LR, LNM, BM
	[60]	Cimitan	2006	100	58	21	21	—	48.3	54	—	LR, LNM, BM
	[54]	Husarik	2007	68	68	—	13	—	10.8	87	—	LR, LNM, BM
	[67]	Vees	2007	20	20	—	—	35	0.4	50	—	LR
	[68]	Pelosi	2008	56	56	—	—	—	—	43	—	LR
	[69]	Steiner	2009	47	17	30	—	67	3.3	81	—	LR, LNM
^{11}C-Cho	[56]	Picchio*	2003	100	77	23	—	—	6.6	47	—	LR, LNM, BM
	[52]	de Jong*	2003	36	20	16	—	—	12	55	100	LR, LNM
	[70]	Ohlmann	2007	45	0	45	—	—	7.8	65	—	LR, LNM
	[59]	Scattoni	2007	25	25	—	—	—	4.0	100	66	LR, LNM
	[71]	Breeuwsma*	2010	80	0	70	—	—	12.3	81	100	LR, LNM, BM
	[55]	Krause	2008	63	42	21	17	47	5.9	56	—	LR, LNM
	[57]	Reske	2008	49	49	—	9	59	2.0	73	88	LR
	[51]	Castellucci	2009	190	190	—	—	46	4.2	39	—	LR, LNM, BM, LUM
	[74]	Giovacchini	2010	358	358	—	155	—	3.8	85	93	LR, LNM, BM, LUM

1280 pts

Ristadiazione

Eur J Nucl Med Mol Imaging (2008) 35:18–23

The detection rate of [^{11}C]Choline-PET/CT depends on the serum PSA-value in patients with biochemical recurrence of prostate cancer

B. J. Krause · M. Souvatzoglou · M. Tuncel · K. Herrmann · A. K. Buck · C. Praus · T. Schuster · H. Geinitz · U. Treiber · M. Schwaiger

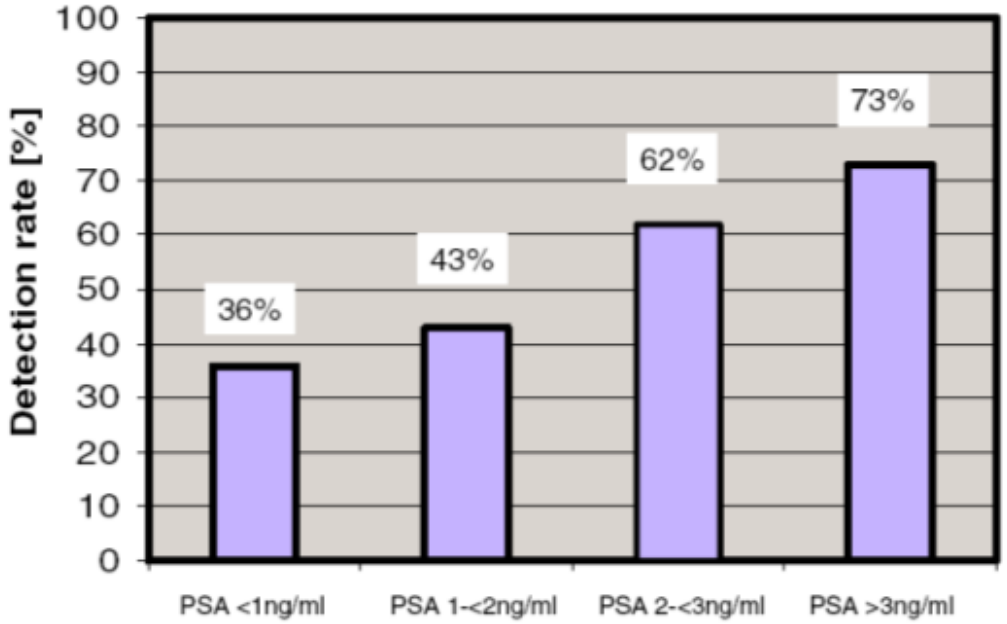


Fig. 1 Detection rate of [^{11}C]Choline-PET/CT plotted against the PSA-value for recurrent prostate cancer

Ristadiazione

Eur J Nucl Med Mol Imaging (2010) 37:1106–1116

PSA doubling time for prediction of [^{11}C]choline PET/CT findings in prostate cancer patients with biochemical failure after radical prostatectomy

	Univariate analysis		Multivariate analysis	
	Odds ratio (95% CI)	*p*	Odds ratio (95% CI)	*p*
Age	1.03 (0.98-1.08)	0.23	1.03 (0.97-1.10)	0.31
PSA level at PET/CT	1.51 (1.25-1.83)	< 0.0001	1.43 (1.15-1.78)	0.001
PSADT		< 0.0001		0.002
PSADT<3	12.18 (4.18-35.51)	< 0.0001	5.72 (1.56-20.95)	0.008
3<PSADT<6	4.15 (1.97-8.76)	< 0.0001	3.70 (1.56-8.75)	0.003
Androgen deprivation therapy	2.58 (1.36-4.89)	0.004	1.49 (0.64-3.48)	0.36
Time to trigger PSA	1.00 (0.99-1.01)	0.56	1.00 (0.98-1.01)	0.62
Pathological stage		0.002		0.18
pT3 pN0 and pT4 pN0	1.92 (0.96-3.84)	0.066	2.01 (0.84-4.78)	0.12
Any T pN1	4.90 (1.99-12.06)	0.001	2.61 (0.78-8.74)	0.12
Gleason score>7	1.69 (0.87-3.21)	0.12	0.99 (0.42-2.32)	0.97

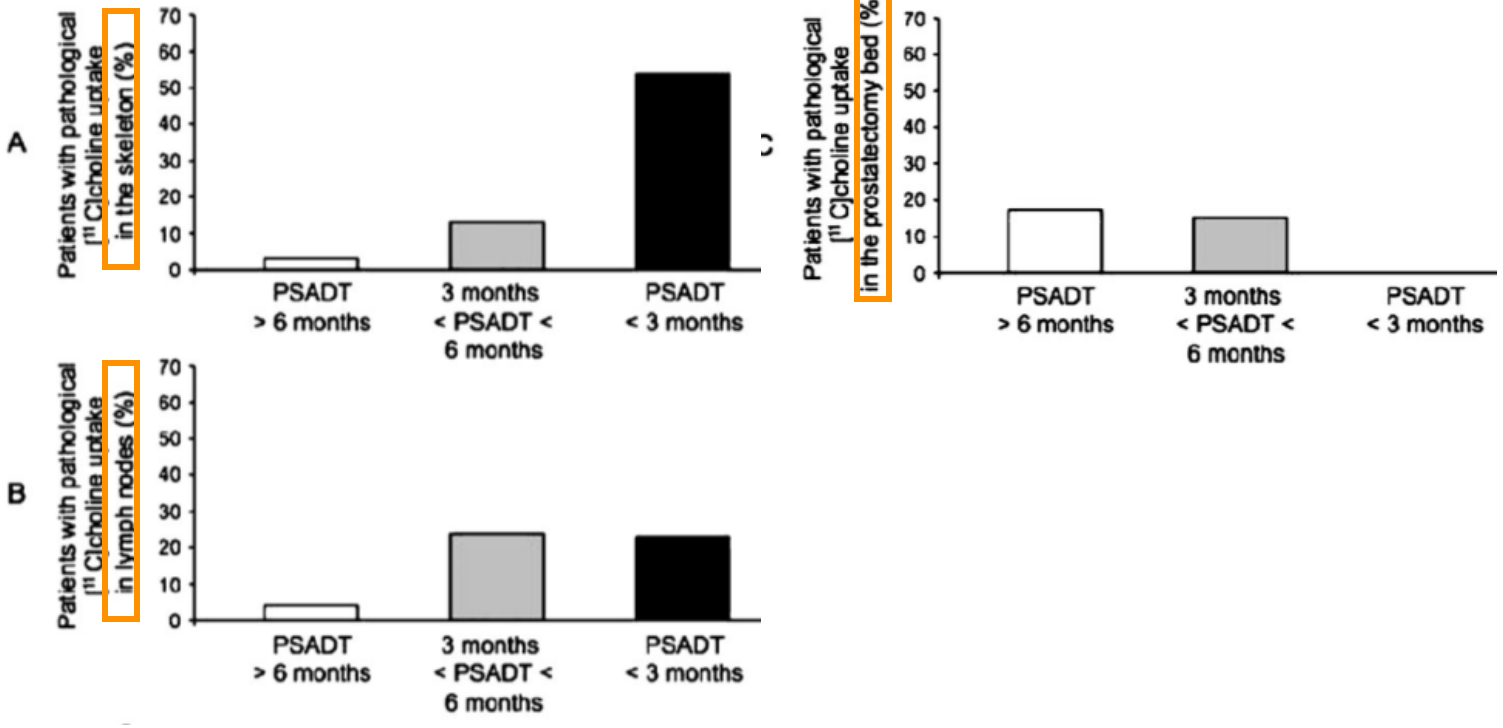
Ristadiazione

Eur J Nucl Med Mol Imaging (2010) 37:1106–1116

PSA doubling time for prediction of [^{11}C]choline PET/CT findings in prostate cancer patients with biochemical failure after radical prostatectomy

Eur J Nucl Med Mol Imaging (2010) 37:1106–1116

Fig. 4 Number of patients with pathological [^{11}C]choline PET/CT uptake in the skeleton (a), in lymph nodes (b) and in the prostatectomy bed (c) in the three subgroups of patients stratified on the basis of PSADT values

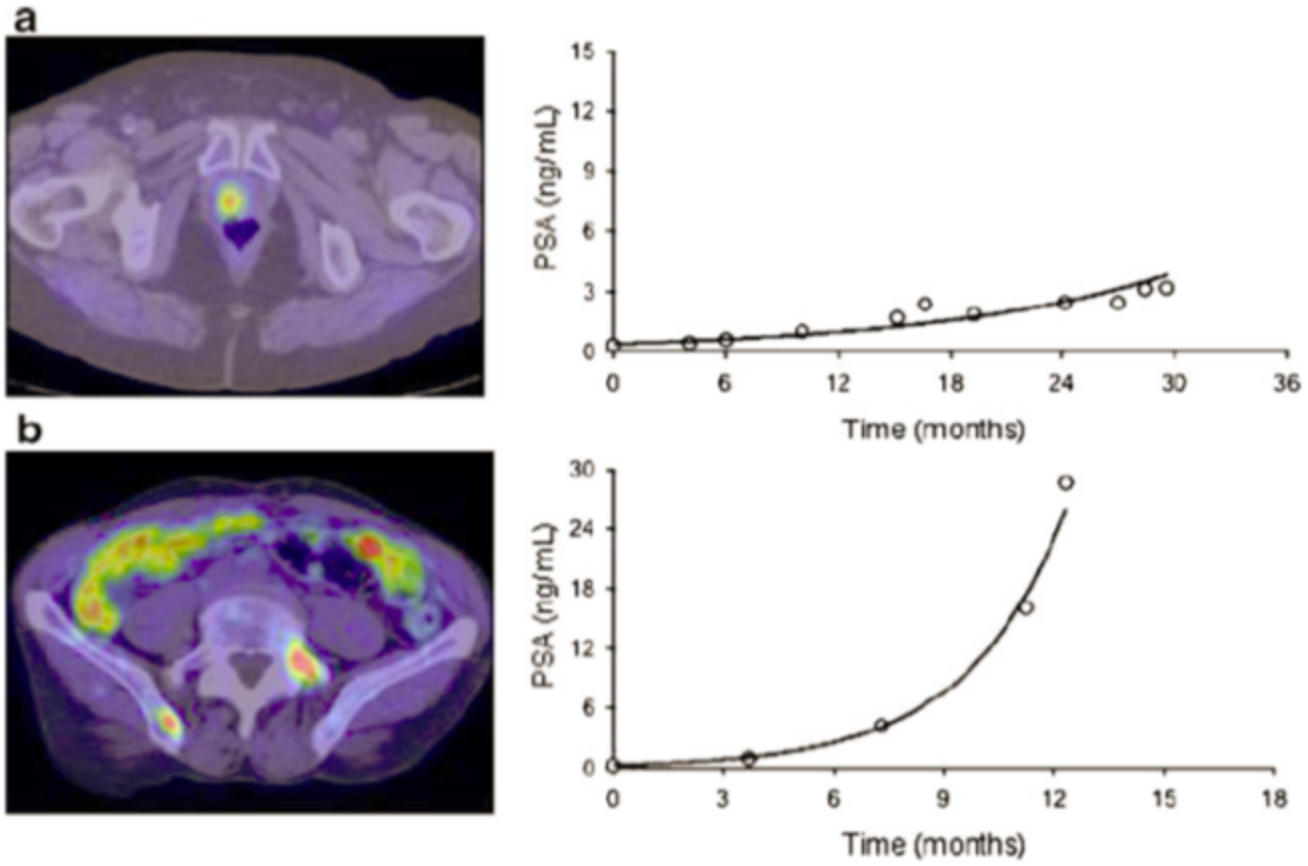


Ristadiazione

Eur J Nucl Med Mol Imaging (2010) 37:1106–1116

PSA doubling time for prediction of [^{11}C]choline PET/CT findings in prostate cancer patients with biochemical failure after radical prostatectomy

Fig. 1 a Patient with pathological [^{11}C]choline uptake in the prostatectomy bed. There were no other sites of pathological [^{11}C]choline uptake. The equation of the exponential curve is: $Y=0.38 * e^{0.078X}$, $r^2=0.91$. PSADT was 8.9 months. Histological confirmation of local recurrence was obtained with vesicourethral anastomosis biopsy. b Patient with pathological [^{11}C]choline uptake in the left transverse process of L5 and in the right iliac bone. Pathological [^{11}C]choline uptake was also evident in the left ischiopubic bone (not shown). The equation of the exponential curve is: $Y=0.27 * e^{0.369X}$, $r^2=0.99$. PSADT was 1.9 months



Ristadiazione

Q J NUCL MED MOL IMAGING 2011;55:1-2

Fluorocholine (^{18}F) and sodium fluoride (^{18}F) PET/CT in the detection of prostate cancer: prospective comparison of diagnostic performance determined by masked reading

W. LANGSTEGER

TABLE II.—*Patient-based diagnostic performance and comparison, according to the status of the patient: initial staging or search for recurrence.*

Per patient	Sensitivity initial	Sensitivity recurrence	Specificity initial	Specificity recurrence	Accuracy initial	Accuracy recurrence
FCH	7/8=88%	13/14=93%	8/9=89%	8/9=89%	15/17=88%	21/23=91%
F Na	7/8=88%	13/14= 93%	7/9=78%	8/9=89%	14/17=82%	21/23=91%
Mc Nemar's test	FCH=0 F Na=0 NA	FCH=1 F Na=1 P>0.9	FCH=1 F Na=0 P>0.9	FCH=0 F Na=0 NA	FCH=1 F Na=0 P>0.9	FCH=1 F Na=1 P>0.9

In patients referred for suspicion of recurrence, FCH was significantly more specific than FNa (96% vs. 91%, P=0.02) while sensitivity was the same, 89%.

If FCH is available, it should be preferred

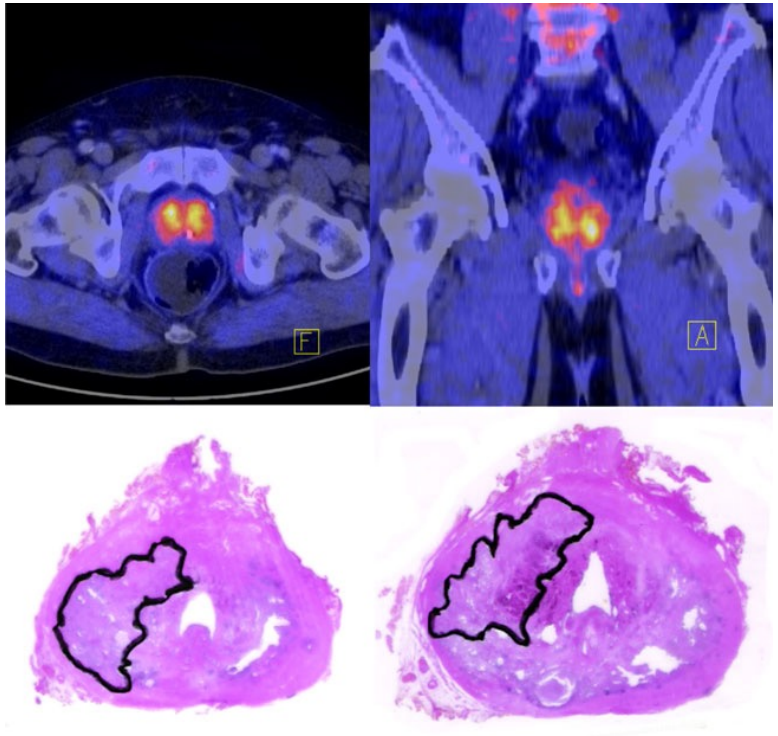
Piano RT

Eur J Nucl Med Mol Imaging (2013) 40:824–831

Tumour volume delineation in prostate cancer assessed by [^{11}C]choline PET/CT: validation with surgical specimens

Ralph A. Bundschuh

- 20 patients
- Histopathological tumour location and size compared with the choline PET/CT
- Different segmentation algorithms
- Only 13/28 (46 %) of lesions had corresponding focal choline uptake
- No suitable SUV threshold (absolute/ relative) was found for GTV segmentation to fit the volume to the histological tumour volume



Patient with increased choline uptake in the whole prostate on the PET/CT (top) with no additional focal uptake corresponding to the pathological findings (bottom)

Piano RT

Radiation Oncology 2011, 6:44 doi:10.1186/1748-717X-6-44

[18F]fluoroethylcholine-PET/CT imaging for radiation treatment planning of recurrent and primary prostate cancer with dose escalation to PET/CT-positive lymph nodes.

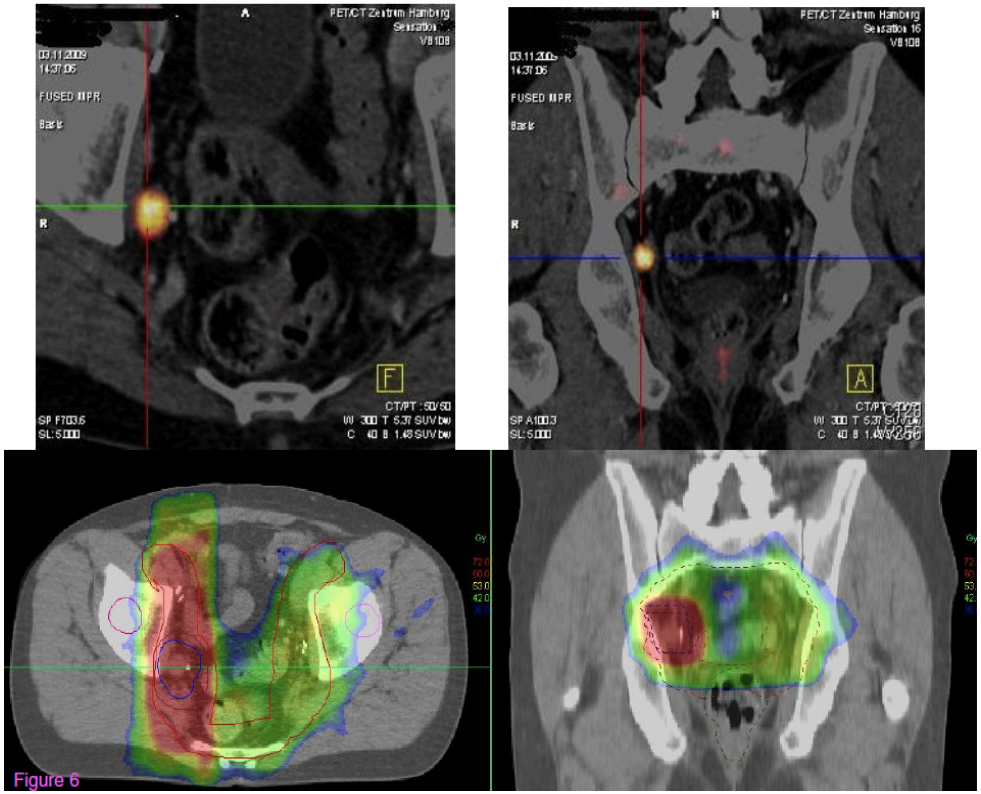


Figure 6

F18-fluoroethylcholine-PET/CT could be helpful in dose escalation in prostate cancer allowing boost doses > 60 Gy to metastatic lymph nodal regions if PET/CT-planned intensity modulated and image guided radiotherapy is used. Thus, there might be still a curative chance for selected patients with metastatic lymph nodes or recurrent disease.

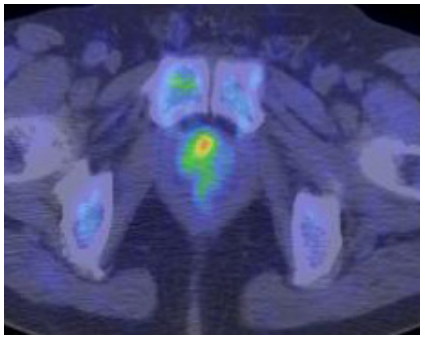
Terapia ormonale

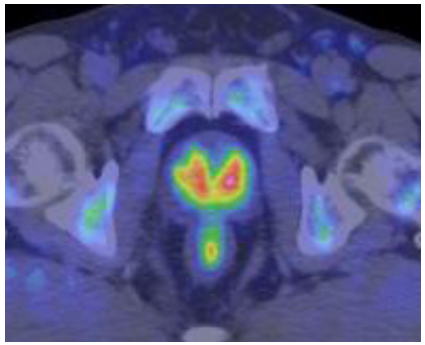
Author	Pts	Pre e post tp
DeGrado et al.	1	After 2 mths uptake decreased by more than 60%
De Waele et al.	1	After 6 mths uptake was no longer visible
Giovacchini et al. 2008	6	After 3-12 mths 45 ± 32% uptake decrease in all pts
Fuccio et al. 2011	14	After 6 mnths in 9/14 pts uptake was no longer visible

Giovacchini et al. EJNMMI 2008

Pre ADT

SUVmax = 4.5

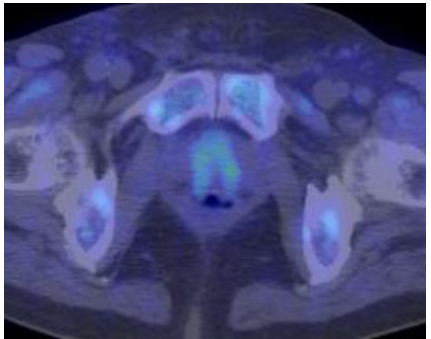


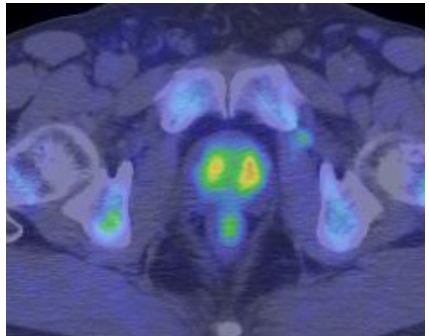


SUVmax = 11.9

Post ADT

SUVmax = 1.8





SUVmax = 4.1

Terapia ormonale

		Patients				Positive detection rate			
Author	Tracer	Tot	PSA	ADT resistant	No ADT	Tot	ADT resistant		No ADT
Cimitan et al. 2006	18F-Chol	58	0.12-511	48%	52%	54%	50%	>	27%
Krause et al. 2008	11C-Chol	63	0.2-39	27%	73%	56%	65%	>	52%
Husarik et al. 2008	18F-Chol	68	0.36–100	22%	78%	86%	85%	=	85%
Garcia et al. 2009	11C-Chol	38	0.8-9.5	26%	74%	68%	70%	>	68%
Giovacchini et al. 2010	11C-Chol	356	0.23-45	43%	57%	45%	56%	>	36%
Giovacchini et al. 2010	11C-Chol	170	0.23-48.6	37%	63%	45%	59%	>	36%
Richter et al. 2010	11C-Chol	73	1.1-5.4	21%	79%	59%	71%	>	56%
Castelucci et al. 2011	11C-Chol	102	<1.5	16%	84%	28%	P>0.05	=	
Henninger et al. 2012	18F-Chol	35	<4	37%	63%	60%	80%	>	50%
Ceci et al. 2013	11C-Chol	157	0.2 – 60.6	100%	-	66%	66%		-
Beheshti et al. 2013	18F-Chol	250	0.2–4,692	55%	45%	74%	85%	>	60%
Chondrogiannis et al. 2013	18F-Chol	46	1-49	50%	50%	80%	82%	=	-

Modified from Giovacchini et al. QJNMMI 2012

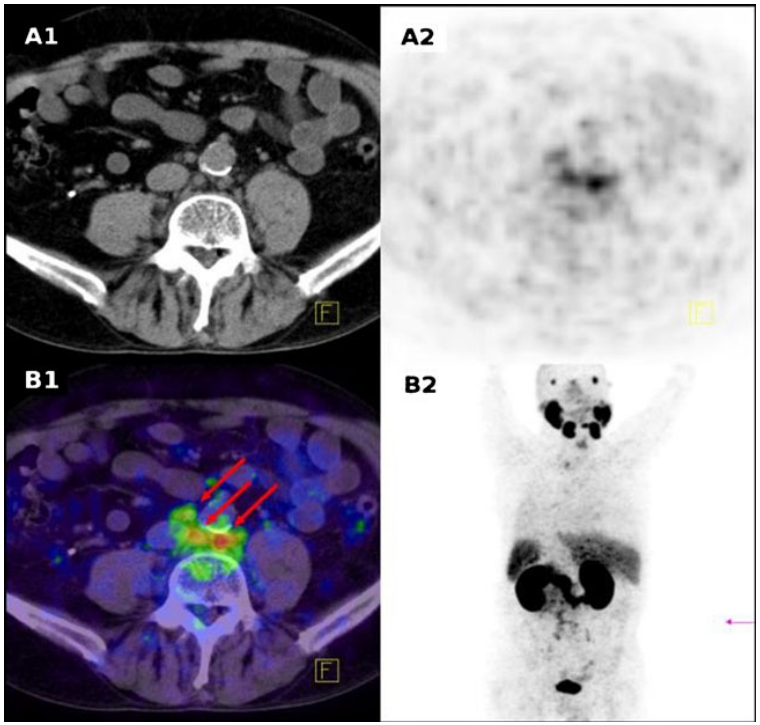
Prospettive

PET imaging with a [^{68}Ga]gallium-labelled PSMA ligand for the diagnosis of prostate cancer: biodistribution in humans and first evaluation of tumour lesions

Eur J Nucl Med Mol Imaging (2013) 40:486–495

A. Afshar-Oromieh · A. Malcher · M. Eder · M. Eisenhut ·

- 37 patients
- In 31/37 patients at least one lesion suspicious for cancer was detected determing a detection rate of 83.8%
- At PSA < 2.2 ng/ml, lesions suspicious for cancer were observed in 60% of the patients.
- At PSA > 2.2 ng/ml, lesions were detected in all patients.



Lymph nodes with clearly visible pathological tracer uptake

Prospettive

Am J Nucl Med Mol Imaging 2013;3(1):85-96

Characterization of primary prostate carcinoma by *anti*-1-amino-2-[^{18}F] -fluorocyclobutane-1-carboxylic acid (*anti*-3-[^{18}F] FACBC) uptake

David M Schuster

10 patients

Pre-radical prostatectomy *anti*-3-[18F] FACBC-PET/CT

Highest combined sensitivity and specificity were 81.3% and 50.0%, respectively.

SUVmax was significantly higher ($p<0.05$) for malignant sextants,
though there was overlap between malignant and non-malignant sextants.

Limited practical utility for diagnosis, staging and RT planning

Prospettive

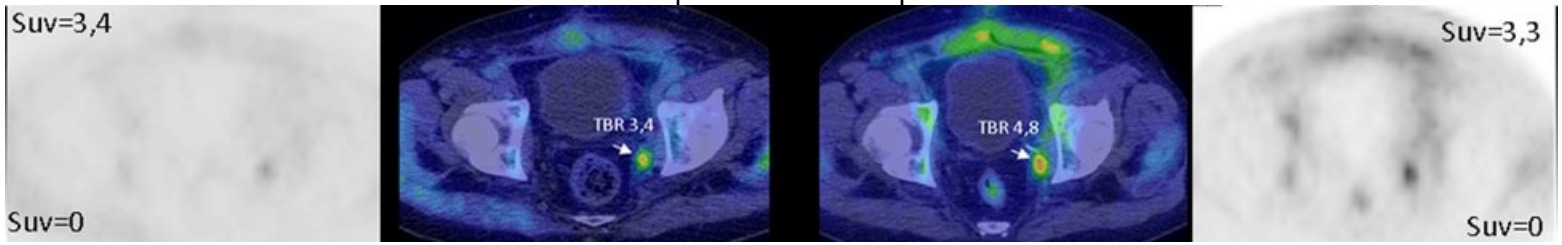
Eur J Nucl Med Mol Imaging

Comparison of ^{18}F-FACBC and ^{11}C-choline PET/CT in patients with radically treated prostate cancer and biochemical relapse: preliminary results

Cristina Nanni

15 patients with biochemical relapse PSA level 2.1± 2 ng/ml (range 0.2–8.48 ng/ml)

11C-choline PET/CT		Anti-3-18F-FACBC PET/CT
detection rate 3/15 pts (20 %)	p=0,25	detection rate 6/15 pts (40 %)
6 lesions	p=0,07	11 lesions



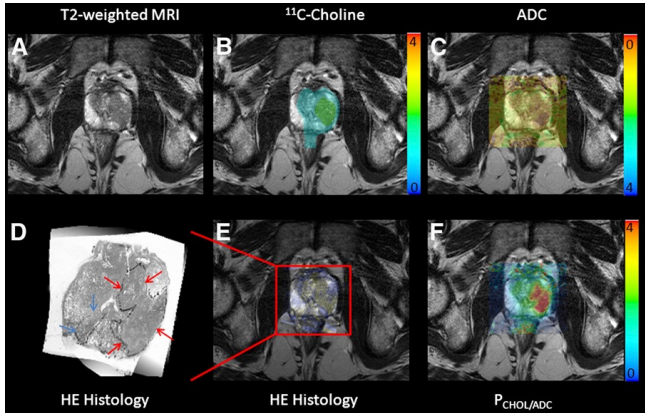
Conclusion
Better lesion detection with anti-3-18F-FACBC than with 11C-choline
Further studies with larger patient populations are required

Prospettive

J Nucl Med 2012; 53:546–551

Introducing Parametric Fusion PET/MRI of Primary Prostate Cancer

Hyunjin Park



At histology, Gleason 4 + 3 lesion is located in left lobe of prostate (red arrows) in peripheral and central zone, which is identified on registered imaging, whereas additional low-volume Gleason 3 + 3 lesion in right lobe is not identified (blue arrows).

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Improved detection of localized prostate cancer using co-registered MRI and ^{11}C-acetate PET/CT

Ivan Jambor[a,b,c,*], Ronald Borra[a,c,d,1], Jukka Kemppainen[c,e,2], Virva Lepomäki[c,3],

Hybrid PET/MRI may further improve identification and localization of primary PCa

Conclusioni

- Diagnosi - NO
- Stadiazione – Alto rischio
- Ristadiazione – SI
- Piano di trattamento RT – dopo Recidiva
- Terapia sistemica – Non sospendere