TNM　　　　　 (TNM 97)

:　　　　　　　　　　　　　　　　　　　　　　[1]

.　　　.　　　.　　　.

:　　　　　　　TNM　　　　　　　　　　　　　　　　　　 (computed tomography, CT)　　　　　 T 　　　　　　　　　　　　　　　　　　 T 　　　　　　　　　　　.

: 1991　　　 1997　　　　　　　　　　　　　　 112 　　　 CT 　　　　　　　.　 3　　　　　　　　　　 70 　　　

T　　　　　　　　　 .

:　 TNM　　　　　 CT　　　　　 T1= 5(4%), T2= 73(65%), T3a= 21 (19%), T3b= 9(8%), T3c= 0(0%), T4= 4(4%)　　 ,　　　　 TNM　 T1= 54(48%), T2= 24(21%)　 .　　　 TNM　　　　 CT　 79%(88/112)　　　　　　 17 ,　　　　　　 7　　　　　　　 CT　　　 T1: 84%, 91%; T2: 71%, 95%; T3a: 69%, 88%; T3b: 78%, 98%; T4: 75%, 99%　　　　 .　　 TNM　　　　 CT 77%(86/112)　　　　　　　 T1: 44%, 99%; T2: 82%, 71%　　 . CT T　　　　　　　 T1　　　　　 T1　　　　 T2 0%(0/4), 8%(3/39), 29%(4/14)　　　　　　　　　　 T3a, T3b 67%(6/9), 75%(6/8)　　 T1　　　　　　　　　 .

: TNM　　　　 CT　 T1　　　　　　　 T1 .　　　　 T1　　　　 2.5 cm　 7 cm T1　　　　 T1　　　　　　　　　　 .

Joint Committee on Cancer (AJCC)　　 1997 .　　　　　　　　 T1　 T2 (Computed tomography, CT)　　　　　　 2.5 cm　 7 cm (6, 7) (Table (1, 2).　 1).

CT　　　　　　　　　 TNM CT　　　　　 T T (3, 4).　　　　　　　　.

1997　 TNM (5).　　　　 TNM　 (TNM 92) Union International Contre le Cancer (UICC)　 American　 1991　　 1997　　　　　 112

21　 CT

91　 CT　　　.　　 71:41

:   TNM   (TNM 97)

,   24   77   T
55 .   . T1   T2

CT   Somatom 2   Somatom Plus-   chi- squared test
S (Simens, Erlangen, Germany)   . Somatom 2   ,   0.05
(Ultravist, Schering   Statistical Package for Social Science (SPSS) program
Pharmaceuticals, Berlin, Germany   Optiray, Mallinckrodt   .
Medical Inc., Pittsburgh, U.S.A.) 50 ml
100 ml
, Somatom Plus- S   140 ml
3 ml   CT   T1   T2
.   10 mm,   2.5 cm   7 cm
10 mm   .   T1   5   54   73
CT   TNM   TNM (TNM92)   T2   24
TNM(TNM97)   T3a, T3b, T3c, T4   21 , 9
, 0 , 4   (Table 2) (Fig. 1, 2, 3).
CT   T1   9 , T2   77
T1   58 , T2   28
CT   , T3a, T3b, T4   13 , 9 , 4   .
.   TNM   CT
3   70   79%   ,   17 ,
7   (Table 3).
T1   CT   T1

Table 1. TNM Classification of Renal Cell Carcinoma: Old (1992) and New (1997)

T - Primary Tumour(New)
TX Primary tumour cannot be assessed
T0 No evidence of primary tumour
T1 Tumour 7.0 cm or less in greatest dimension, limited to the kidney
T2 Tumour more than 7.0 cm in greatest dimension, limited to the kidney
T3 Tumour extends into major veins or invades adrenal gland or perinephric tissues but not beyond Gerota's fascia
T3a Tumour invades adrenal gland or perinephric tissues but not beyond Gerota's fascia
T3b Tumour grossly extends into renal vein(s) or vena cava below diaphragm
T3c Tumour grossly extends into vena cava above diaphragm
T4 Tumour invades beyond Gerota's fascia
T - Primary Tumour(Old)
T1 Tumour 2.5 cm or less in greatest dimension, limited to the kidney
T2 Tumour more than 2.5 cm in greatest dimension, limited to the kidney
T3 & T4 Same as above the new criteria
N - Regional Lymph Nodes(New)
NX Regional lymph nodes cannot be assessed
N0 No regional lymph node metastasis
N1 Metastasis in a single regional lymph node
N2 Metastasis in more than one regional lymph node
N- Regional Lymph Nodes(Old)
N1 Metastasis in a single lymph node,   2 cm in greatest dimension
N2 Metastasis in a single lymph node, >2 cm but not > 5 cm in greatest dimension: or multiple lymph nodes, none > 5 cm in greatest dimension
N3 Metastasis in lymph node > 5 cm in greastest dimension
M- Distant Metastasis
MX Distant metastasis cannot be assessed
M0 No distant metastasis
M1 Distant metastasis

84%, 91%,   T2   71%, 95%   ,
T1   44%, 93%,   T2   82%, 71%,
T3a   69%, 88%

T1   T1

, T2

(Table 4).   46
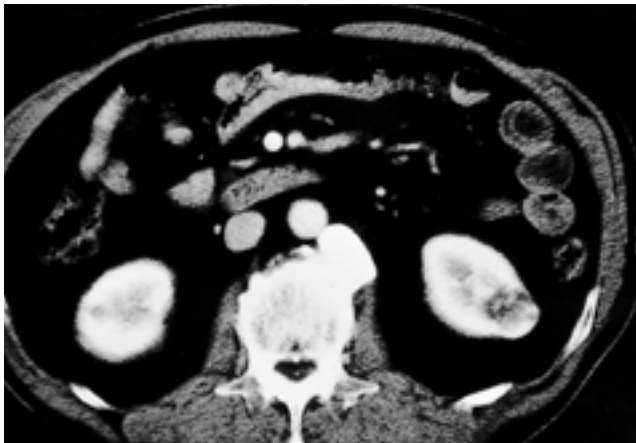CT   87%,
89%, 86%   .

3   70
T   CT   T
T
T1   T1
T2, T3a, T3b, T4
T1   . CT   T
T1   ,   T1
T2   , T3a,

T3b   T4   T1
(Table 5).

,

(8).

1958   Flocks   Kadesky
1963   Robson   (9)

Table 2. Distribution of Patients according to CT Stage T

T stage	Old classification (1992) patient No. (%)	New classification (1997) patient No. (%)
T1	5 (4)	54 (48)
T2	73 (65)	24 (21)
T3a	21 (19)	21 (19)
T3b	9 (8)	9 (8)
T3c	0 (0)	0 (0)
T4	4 (4)	4 (4)

Table 3. Correlation between CT and Pathologic Stage T (TNM 1997)

CT Staging	Pathologic Staging					Total
	1	2	3a	3b	4	
1	49	1	2	2	0	54
2	3	20	1	0	0	24
3a	6	5	9	0	1	21
3b	0	1	1	7	0	9
4	0	1	0	0	3	4
Total	58	28	13	9	4	112
Overall accuracy					79% (88/112)	

Fig. 1. Post-enhanced CT shows 2 cm sized, heterogeneously low density nodule in left kidney. CT stage was T1 by old and new TNM classification and this tumor was 2.3 cm sized, pathologic stage T1 renal cell carcinoma.
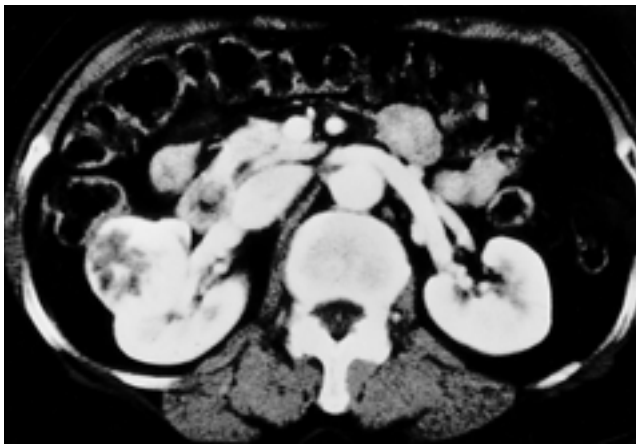

Fig. 2. CT shows 3 cm sized, heterogeneously well-enhancing mass in right kidney. CT stage was T2 by old classification but now T1 by new TNM classification.
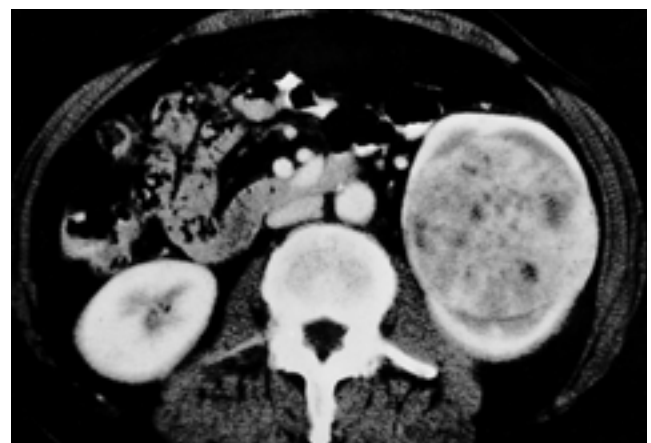

Fig. 3. CT shows 10 cm sized, heterogeneously high density mass in left kidney without evidence of extension to the per-inephric space. CT stage was T2 and this tumor was 9.5 cm sized, pathologic stage T2 renal cell carcinoma.
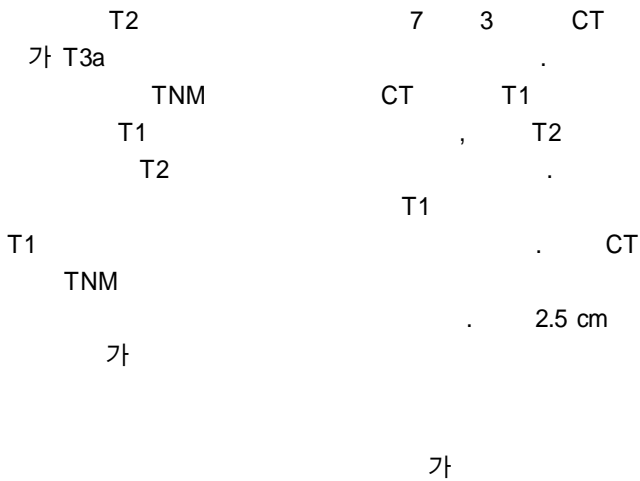
Table 4. Sensitivity and Specificity of CT Staging

Stage	Old TNM (1992)			New TNM (1997)		
	% Sensitivity	% Specificity	p	% Sensitivity	% Specificity	p
T1	44 (4/9)	99 (102/103)	<0.05	84 (49/58)	91 (49/54)	<0.05
T2	82 (63/77)	71 (25/35)	>0.05	71 (20/28)	95 (80/84)	<0.05
T3a	69 (9/13)	88 (87/99)		69 (9/13)	88 (87/99)	
T3b	78 (7/9)	98 (101/103)		78 (7/9)	98 (101/103)	
T4	75 (3/4)	99 (107/108)		75 (3/4)	99 (107/108)	
N	89 (8/9)	86 (32/37)		89 (8/9)	86 (32/37)	

Table 5. Incidence of Metastasis according to Stage T

Stage	CT stage No. of mets./ No. of pts.	p	Pathologic stage No. of mets./No. of pts.	p
T1 (new)	3/39 (7.7%)		3/41 (7.3%)	
T1 (old)	0/4 (0.0%)	>0.05	0/8 (0.0%)	>0.05
T2 (new)	4/14 (28.6%)	>0.05	7/14 (50.0%)	0.02
T3a	6/9 (66.7%)	<0.001	5/9 (55.6%)	<0.001
T3b	6/8 (75.0%)	<0.001	4/6 (66.7%)	<0.001

TNM

1978 UICC
(10).
(11),
Robson
(12, 13).
CT

Dinney (14)
Robson TNM CT
68%, 62% . TNM
CT 79%
T1 44%
7 cm T1
84% . T1
CT 2.5 cm
9 7
CT
, 5 CT T2
.
CT
CT
Fein (15)
67%
CT .
T3a CT
43%
. T3a

11   17
,   1   CT

.

.

,

T3a
(16) CT
.
1997 AJCC UICC T1 T2
2.5 cm 7 cm
.

Bottiger(17) 7 cm 5
30% . 3 cm
13 42
5
,
2 (18). 10
T1 T2
2.5 cm
(10, 19). 97
TNM
(5,
20).

CT
T 7 cm
. CT
2.5 cm T1
, T1 3
CT 5 cm .
T2 T1
CT CT

T2   7   3   CT

T3a

       TNM   CT   T1

   T1   ,   T2

      T2

                T1

T1   .   CT

   TNM

                          2.5 cm

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CT Staging of Renal Cell Carcinoma Using the Revised 1997 TNM Staging Criteria: In Comparison with the Previous One[1]

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Purpose: To assess the accuracy of preoperative CT staging of RCC and to compare the relationship between T stage and the incidence of metastasis on the basis of the old (1992) and the new (1997) UICC & AJCC tumor classification system.

Materials and Methods: In 112 cases of surgically resected RCC, the stagings of preoperative CT scans were determined retrospectively by two radiologists and were compared with the results of pathologic examinations. In 70 cases which had been followed up over three years after surgery, the incidence of metastasis at initial diagnosis and during the follow-up period was assessed. All cases were reconsidered, and using the old and the new TNM classification, the incidence of metastasis was compared.

Results: According to the old TNM classification, 5 cases (4%) were staged at T1, 73(65%) at T2, 21(19%) at T3a, 9(8%) at T3b, 0 at T3c, and 4(4%) at T4. Using the new TNM classification, we also staged 54 cases (48%) at T1 and 24(21%) at T2. Overall, using this new classification, CT correctly staged 79% of patients (88/112) overstaged 15%(17/112) and understaged 6%(7/112) . CT had a sensitivity of 84% and specificity of 91% in new T1 tumors, 71% and 95%, respectively, in new T2 tumors, 69% and 88% in T3a tumors, 78% and 98% in T3b tumors, and 75% and 99% in T4 tumors. CT had a sensitivity of 44% and a specificity of 99% in old T1 tumors, and 82% and 71%, respectively, in old T2 tumors. The incidence of metastasis in CT-staged (cT) tumors was 0% (0/4) in old cT1, 8% (3/39) in new cT1, 29% (4/14) in new cT2, 67% (6/9) in cT3a, and 75% (6/8) in cT3b.

Conclusion: In the staging of T1 tumors, CT is more sensitive when the new TNM classification is used. Even though the cut off point between T1 and T2 tumors had been in creased from 2.5 to 7.0 cm, T1 tumors staged according to the new system did not show a significantly higher incidence of metastasis than those staged according to the old.

Index words : Kidney neoplasms, CT
Kidney neoplasms, staging

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