

Neerutuumorid

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Esinemissagedus ja elulemus Eestis

- 2019. a esmasjuhtude arv on Eestis 149
- Sageduselt 8. paige
- 57,3% juhtudest lokaalne haigus, 16,6% kauglevikuga
- Elulemus:
 - 5 aasta elulemus 69%
 - 10 aasta elulemus 62%

Neerutuumorite klassifikatsioon

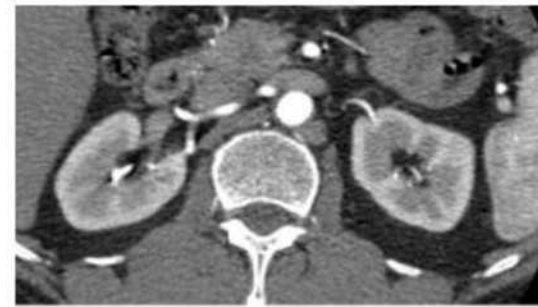
- **Tsüstjad vs soliidsed**
- **Beniigsed vs maliigsed**
- **Maliigsete tuumorite histoloogiline klassifikatsioon**
 - **Neerurakulised kartsinoomid (RCC) – tuubulite epiteelist lähtunud, 80-90% juhtudest**
 - **Helerakuline RCC (ccRCC) – 70-80 %**
 - **Papillaarne RCC**
 - **Kromofobne RCC**
 - Kogumistorukeste RCC
 - Neeru medullaarne kartsinoom
 - Sarkomatoidne RCC
 - Metanefrilised tuumorid
 - Segatüüpi epiteliaalsed ja stromaalsed tuumorid
 - Mesenhümaalsed tuumorid
 - Embrüonaalsed tuumorid
 - Neuroendokriinsed
 - Metastaasid

Kliiniline pilt

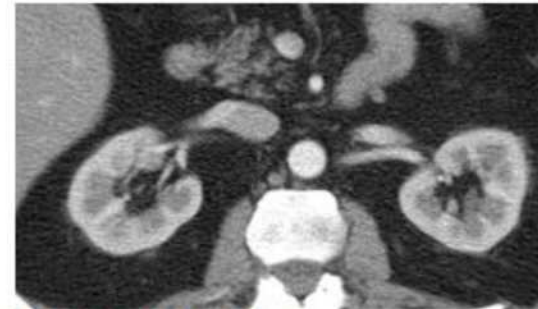
- Makroskoopiline hematuria (~60% juhtudest)
- Tuim valu
- Palpeeritav mass
- **Enamus neerutumoreid on juhuleid**
- Geneetiline predisponeeritus
 - Von Hippel Lindau sündroom
 - Tuberoosne skleroos
 - Birt-Hogg-Dube sündroom

KT-uuringu protokoll

- Natiiv
 - Rasv, kaltsifikaadid, hemorraagia, valgurohke vedelik
- Kortikomedullaarne faas – 25-40 sek
- Nefrogeenne faas – 100-120 sek
 - Tuumorid, tuumortrombid
- Hilisfaas – 7-8 min
 - Kui transitoorakuline kartsinoom on dif. diagnoosina võimalik
 - Kollektorsüsteemi haaratuse hindamine (enne operatsiooni/ablatsiooni)
- **Reaalsus: enamasti portovenosne faas**



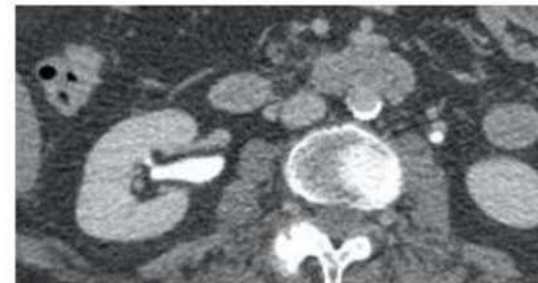
Arterial phase



Corticomedullary phase



Nephrographic phase



Excretory phase

Tsüstjad lesioonid – Bosniaki klassifikatsioon 2019

- **Uuendatud 2019. aastal**

- parandada kõrgema riski kategooriate spetsiifilisust
- vähendada subjektiivsust

- **Ametlikult väljatoodud ka MRT**

- Nodulaarsed/suured kaltsifikaadid
- Ühtlaselt kõrge tihedusega massid, mis on suuremad kui 3 cm
- Heterogeense struktuuriga, kuid KT alusel ei kontrasteeru

- **Millal kasutada?**

- Tsüstjad massid (sisaldab pehmekeelist komponenti <25% mahust)

- Viitan ka 03.11.2021 H.Vilt. [Neerutsüstid](#)

Tsüstjad lesioonid – Bosniaki klassifikatsioon 2019

- **Millal mitte kasutada?**

- Infektsioossed, põletikulised või vaskulaarsed lesioonid
- Pehmekoelise komponendi maht >25%
- Geneetilised sündroomid, mis predisponeerivad neerutuumoritele
- Tsüstid d alla 1 cm

- **Defineerib kasutatavad terminid**

- **Terminoloogia, mida ei soovitata kasutada**

- Komplitseeritud tsüst
- Komplekstsüst

Vana versioon

Table 1: Details of the Current Bosniak Classification of Cystic Renal Masses

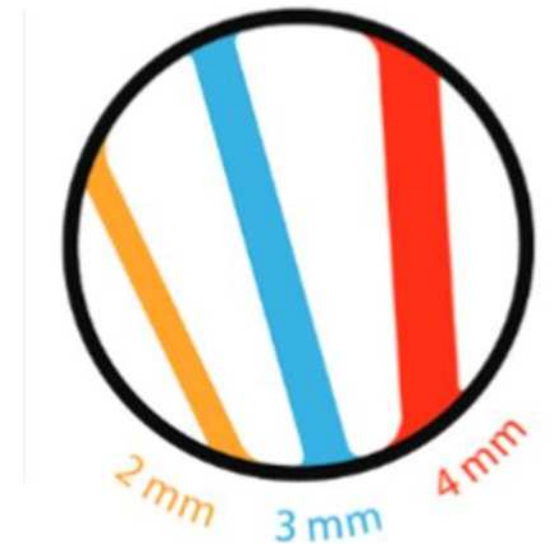
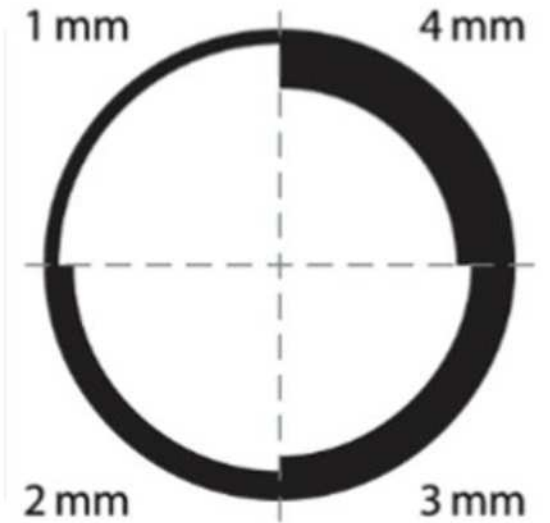
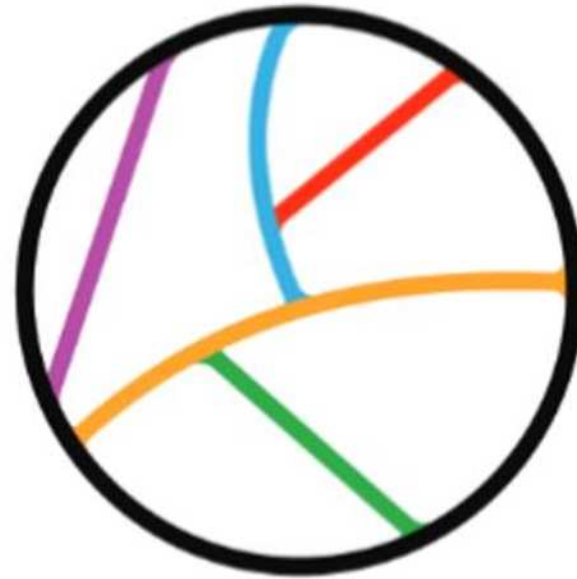
Class	Current Bosniak Classification
I	<u>Hairline-thin wall</u> ; water attenuation; no septa, calcifications, or solid components; nonenhancing
II	Two types: 1. <u>Few thin septa</u> with or without perceived (not measurable) enhancement; fine calcification or a short segment of slightly thickened calcification in the wall or septa 2. Homogeneously high-attenuating masses ≤ 3 cm that are sharply marginated and do not enhance
IIF	Two types: 1. <u>Minimally thickened or more than a few thin septa</u> with or without perceived (not measurable) enhancement that may have thick or nodular calcification 2. Intrarenal nonenhancing hyperattenuating renal masses > 3 cm
III	<u>Thickened or irregular walls or septa</u> with measurable enhancement
IV	Soft-tissue components (ie, nodule[s]) with measurable enhancement

Note.—Adapted, with permission, from reference 10.

Terminite definitsioonid uue Bosniaki klassifikatsiooni järgi

- **Kontrasteerumine** – KT-uuringul tiheduse muutus üle 20 HU; MRT-I signaali intensiivsuse tõus 15%
 - ROI 2/3 massist, vältida perifeerseid massi osasid
- **Homogeenne** – kogu mass on ühtlase tihedusega, ei ole kaltsifikaate ega septe
- **Lihtne vedelik**
 - Tihedus -9-20 HU
 - MRT-I liikvori signaaliga

- **Sept** – lineaarne või kaarjas struktuur, mis ühendab kahte pinda
 - „Mõned“ – 1-3 septi (Bosniak II)
 - „Palju“ – 4 või rohkem (Bosniak IIF)
- **Septide/seina paksus**
 - Õhuke – ≤ 2 mm
 - Minimaalselt paksenenud – 3 mm
 - Paksenenud - ≥ 4 mm



- **Ebaühtlane seina/septi paksenemine**

- ≤ 3 mm fokaalne või difuusne kontrasteeruv protrusioon, mis moodustab nürinurga septi/seinaga, millega ta ühenduses on (Bosniak III tunnus);

- **Nodulaarsus**

- Protrusioon, mis moodustab teravnurga septi/seinaga, millega ühenduses on; kontrasteerub
- ≥ 4 mm fokaalne või difuusne kontrasteeruv konveksne protrusioon, mis moodustab nürinurga septi/seinaga, millega ta ühenduses on; kontrasteerub

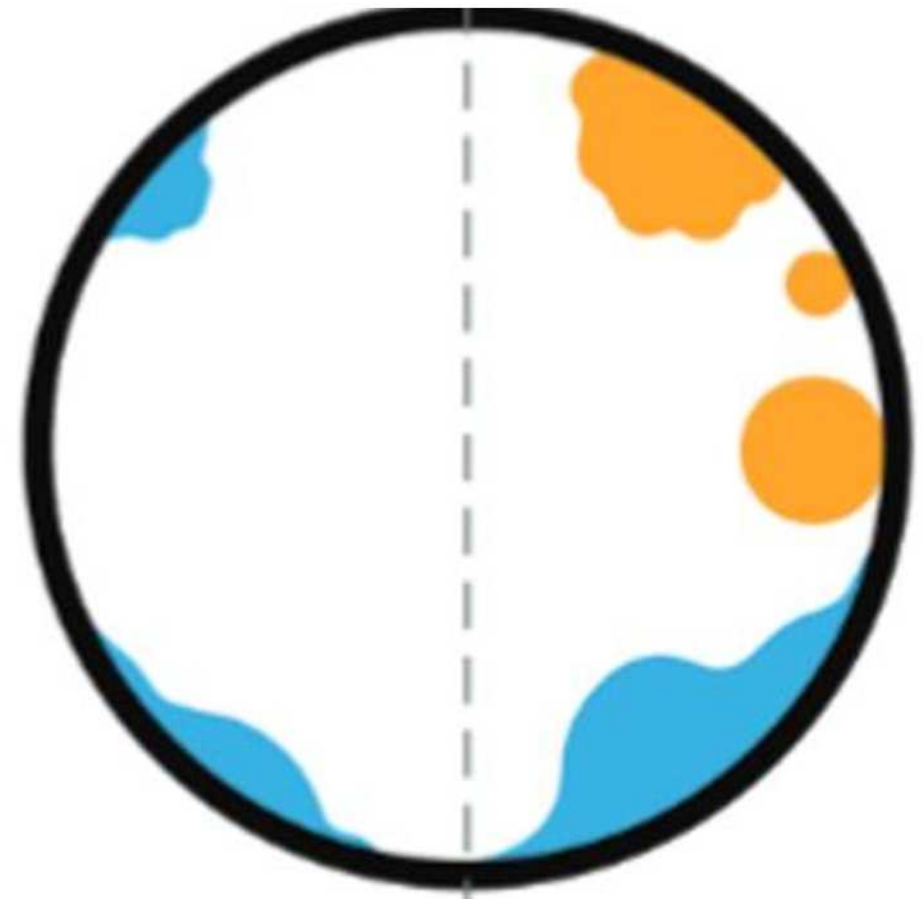


Table 2: Proposed Update to the Bosniak Classification of Cystic Renal Masses

Class	CT: Proposed Bosniak Classification, Version 2019*	MRI: Proposed Bosniak Classification, Version 2019*
I	Well-defined, <i>thin</i> (≤ 2 mm) smooth wall; homogeneous simple fluid (-9 to 20 HU); no septa or calcifications; <i>the wall may enhance</i>	Well-defined, <i>thin</i> (≤ 2 mm) smooth wall; homogeneous simple fluid (<i>signal intensity similar to CSF</i>); no septa or calcifications; <i>the wall may enhance</i>
II	Six types, all well-defined with <i>thin</i> (≤ 2 mm) smooth walls: 1. Cystic masses with thin (≤ 2 mm) and few (1–3) septae; septa and wall <i>may enhance</i> ; may have <i>calcification of any type</i> [†] 2. Homogeneous hyperattenuating (≥ 70 HU) masses <i>at noncontrast CT</i> 3. Homogeneous nonenhancing masses > 20 HU at renal mass protocol CT (73), may have <i>calcification</i> <i>of any type</i> [†] 4. Homogeneous masses -9 to 20 HU at noncontrast CT 5. Homogeneous masses 21 to 30 HU at portal venous phase CT 6. Homogeneous low-attenuation masses that are too <i>small to characterize</i>	Three types, all well-defined with <i>thin</i> (≤ 2 mm) smooth walls: 1. Cystic masses with thin (≤ 2 mm) and few (1–3) <i>enhancing</i> septae; any <i>nonenhancing septa</i> ; may have <i>calcification</i> <i>of any type</i> [†] 2. Homogeneous masses markedly hyperintense at T2-weighted <i>imaging (similar to CSF) at noncontrast MRI</i> 3. Homogeneous masses markedly hyperintense at T1-weighted <i>imaging (approximately $\times 2.5$ normal parenchymal signal</i> <i>intensity) at noncontrast MRI</i>
IIIF	Cystic masses with a smooth minimally thickened (3 mm) enhancing wall, or smooth minimal thickening (3 mm) of one or more enhancing septa, or many (≥ 4) smooth thin (≤ 2 mm) <i>enhancing septa</i>	Two types: 1. Cystic masses with a smooth minimally thickened (3 mm) enhancing wall, or smooth minimal thickening (3 mm) of one or more enhancing septa, or many (≥ 4) smooth thin (≤ 2 mm) <i>enhancing septa</i> 2. Cystic masses that are heterogeneously hyperintense at <i>unenanced fat-saturated T1-weighted imaging</i>
III	One or more enhancing thick (≥ 4 mm width) or enhancing irregular (<i>displaying ≤ 3-mm obtusely</i> <i>margined convex protrusion(s)</i>) walls or septa	One or more enhancing thick (≥ 4 mm width) or enhancing irregular (<i>displaying ≤ 3-mm obtusely margined</i> <i>convex protrusion(s)</i>) walls or septa
IV	One or more <i>enhancing nodule(s)</i> (≥ 4 -mm convex <i>protrusion with obtuse margins, or a convex protrusion</i> <i>of any size that has acute margins)</i>	One or more <i>enhancing nodule(s)</i> (≥ 4 -mm convex <i>protrusion with obtuse margins, or a convex protrusion</i> <i>of any size that has acute margins)</i>

Pahaloomulisuse esinemissagedus erinevates Bosniaki kategooriates

- Bosniak I 0%
- Bosniak II <1%
- Bosniak IIF – 0-38%
 - Jälgida, uuringud 6 ja 12 kuu möödudes; seejärel kord aastas 5 aasta jooksul
- Bosniak III - ~50%
- Bosniak IV - ~90%

Uuendatud klassifikatsioon käsitluses muutusi kaasa ei too.

- Vanus, eeldavat eluiga, kaasuvad haigused jne

Soliidsed tuumorid

- Valdavalt neerurakulised kartsinoomid
- Radioloogi roll
 - püüda võimalusel eristada maliigset ja beniigset muutust
 - on määrata staadium ja lokaalne staatus
 - kirurgilise ravi planeerimine/ablatsiooni planeerimine

Helerakuline RCC

- Tüüpiline palli tüüpi lesioon
 - 5% infiltratiivse kasvuga
- Nekroos, hemorraagia, tsüstiline komponent, kaltsifikaadid
- Kapsliga
- 80% juhtudes sisaldab **intratsellulaarset** rasva
- Tugev kontrasteerumine kortikomedullaarses faasis
 - Raske leida väikseid endofüütseid sõlmi
- Kõige sensitiivsem on nefrogeenne faas – *wash out*
- MRT:
 - T1 kujutisel iso- või hüpointensiivne
 - T2 hüperintensiivne
 - **IP-OP kujutisel signaali langus – ei ole angiomüolipoom!**



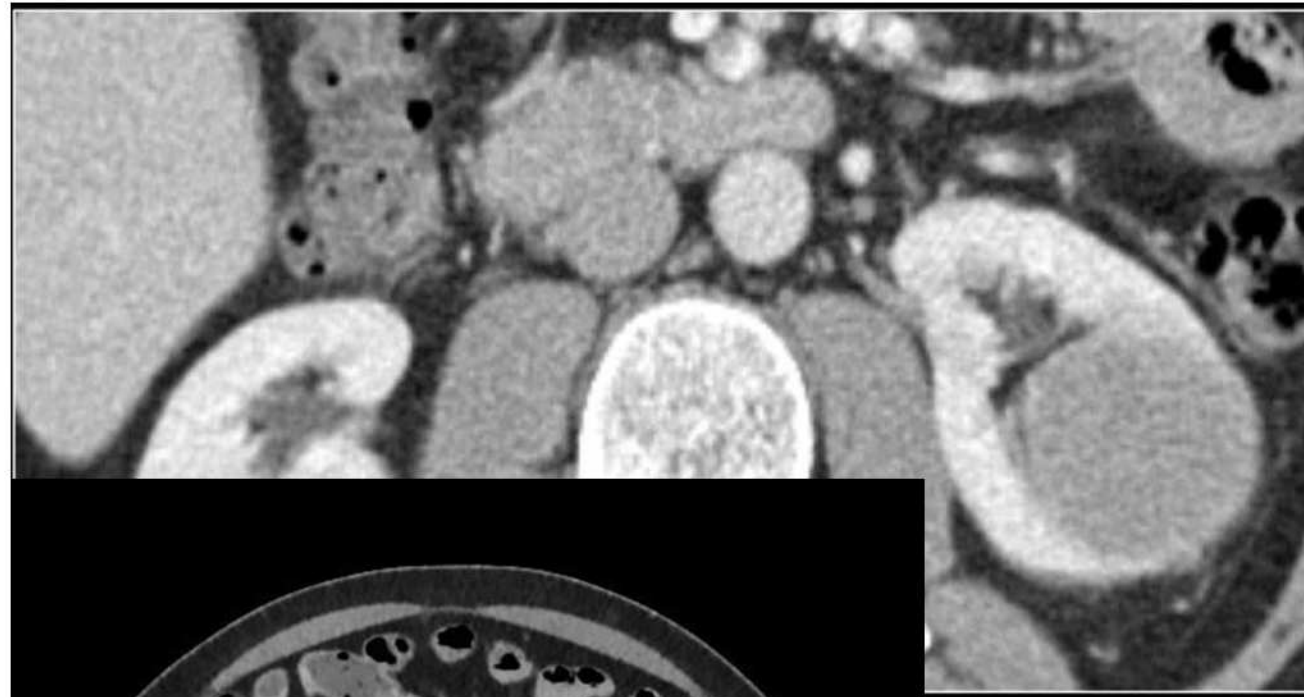
Papillaarne RCC

- 10-15% kõikidest RCC-dest
- Tüüpiliselt homogeensemata struktuuriga ja hüpoovaskulaarsed
 - Nõrk kontrasteerumine, 10-20 HU
- Suured tuumorid heterogeensemata
- Võivad olla bilateraalsed ja multifokaalsed
- Väga harva sisaldavad makroskoopilist rasva ja kaltsifikaate
- MRT
 - T1 madala signaaliga
 - T2 **madala** signaaliga
 - T1 C+ nõrk kontrasteerumine
 - DWI/ADC kujutisel difusioonirestriksioon



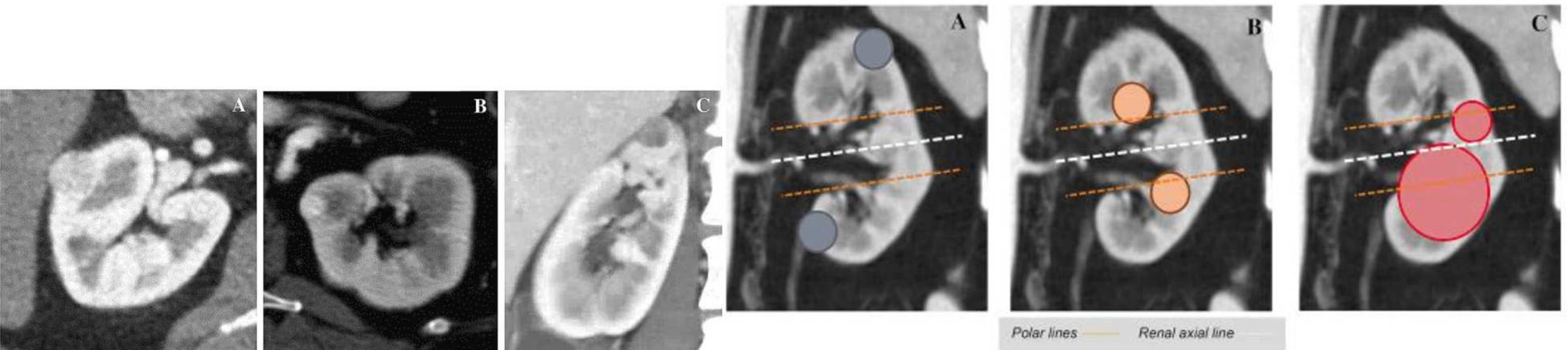
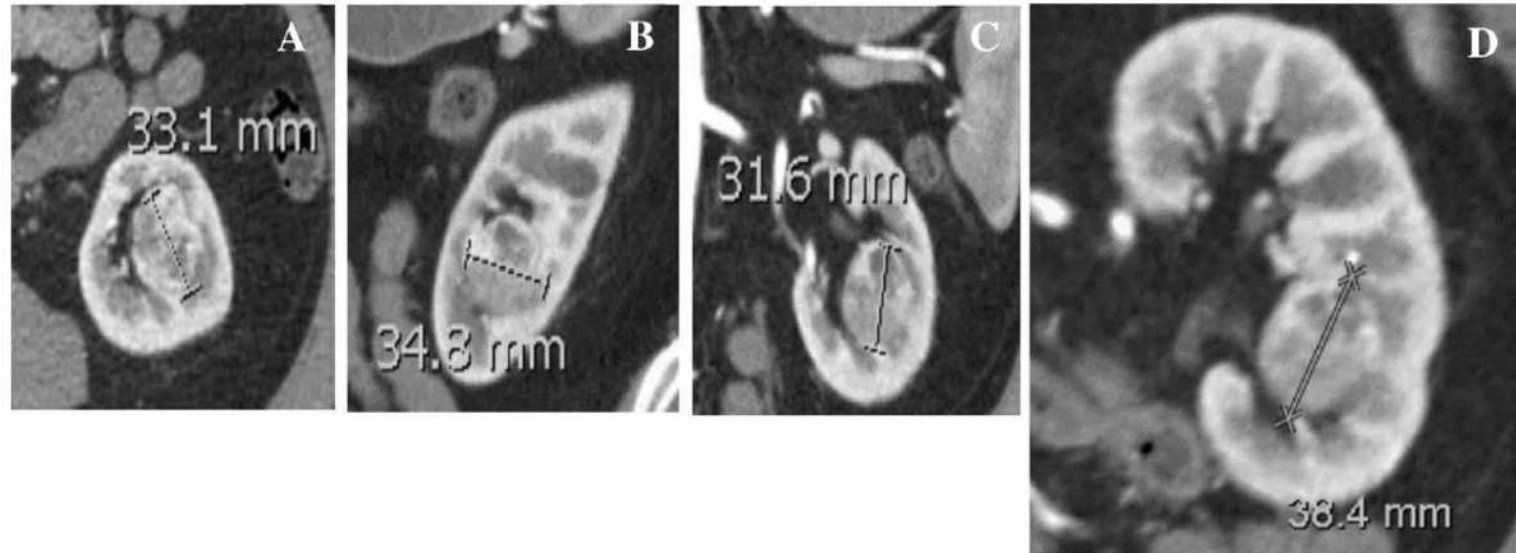
Kromofoobne RCC

- 5% juhtudest
 - Soliidne teravalt piirdunud tuumor
 - Lobulaarne kontuur võimalik
 - Tsentraalne arm, nekroos on harva
 - Kontrasteerub ühtlaselt
-
- **Radioloogiliselt ei saa eristada onkotsütoomist.**



Mida peaks kirjeldama neeru malignse tuumori korral?

- Tuumori mõõtmed, kolmes tasapinnas
 - Olulisim on maksimaalne mõõt
- Lokalisatsioon
 - Poolused
 - Anterioorne või posterioorne neerukontuur



- Neeru kogumissüsteemi/neeru siinuse lähedus
 - Kõige täpsem hindamine hilisfaasis
- Eksofüütne/endofüütne kasvumuster
 - >50% eksofüütne
 - <50% eksofüütne

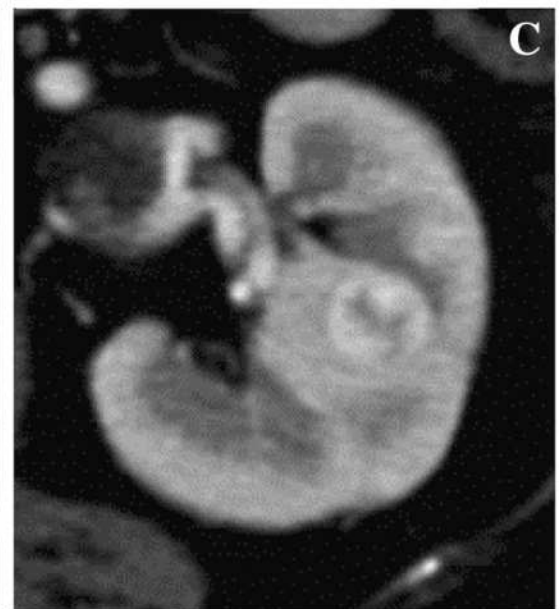
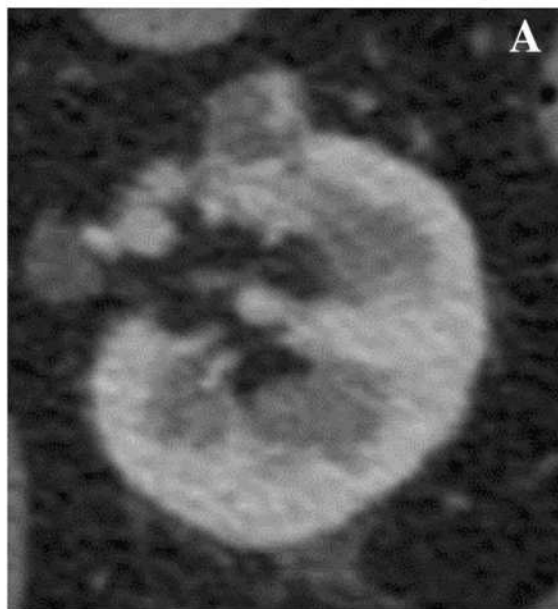
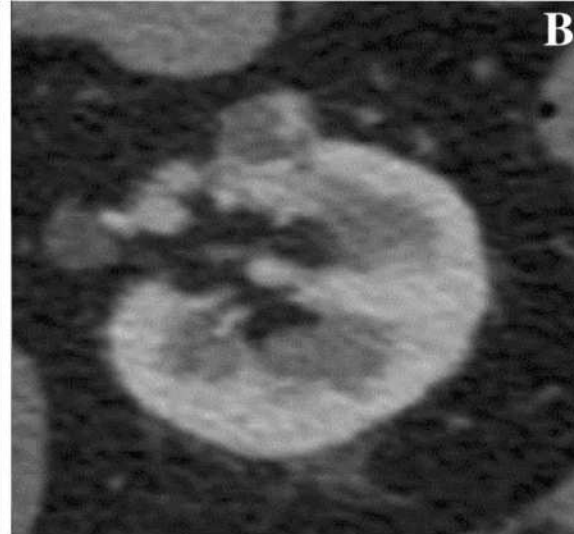
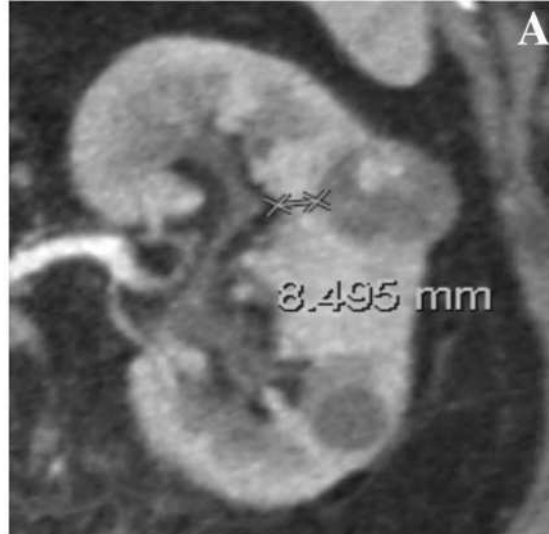


Table 1. R.E.N.A.L. nephrometry score [5] is based on five critical and reproducible anatomical features of solid renal masses

Component	1 Point	2 Point	3 Point
R (radius; maximum dimension in cm)	≤ 4	> 4 but < 7	≤ 7
E (exophytic/endophytic)	$\geq 50\%$ exophytic	$< 50\%$ exophytic	Completely endophytic
N (nearness to collecting system/sinus in mm)	≤ 7	> 4 but < 7	≥ 4
A (anterior/posterior)	Mass location gets a letter added to the score; “A” for masses anterior to the sinus, “P” posterior, and “X” for not applicable.		
L (location relative to polar lines) Suffix “h” assigned if the tumor touches the main renal artery or vein*	Entirely below lower polar or above upper polar lines	Mass crosses polar lines	50% of the mass is across the polar line, mass entirely between polar lines, or mass crosses the axial midline

- Kirjeldab tuumori komplekssust ning aitab valida kirurgilise ravi tehnikat
- < 7 punkti – madal
- 7-9 punkti – mõõdukas
- > 9 punkti – kõrge

Mida peaks kirjeldama neeru malignse tuumori korral? (2)

- Morfoloogia: soliidne, tsüstiline, uroteliaalne/infiltratiivne
- Perinefriumi rasvkoe infiltratsioon
- Gerota fastsia haaratus/kontakt
- Tuumori levik samapoolsesse neerupealisesse
- Muude organite lähedus/haaratus
- Veresooned: neeru- ja alumise õõnesveeni haaratus, lisaveresooned
- Lümfadenopaatia
- Kaugmetastaasid

Involved Kidney:

- **Nephrometry Score:** Radius [] cm; Exophytic/endophytic: [>50% exophytic, <50% exophytic, endophytic]; Nearness to the collecting system: [>7, 4-7, <4] mm; Anterior/posterior: [A, P, X]; Location: [Upper/lower pole: Cross upper/lower polar line, 50% of mass is across polar line, mass entirely between polar lines, or mass crosses the axial midline]; Extension into renal vein [h, None]. Nephrometry Score: [(eg, 8A).] *
- **Extra-renal structures adjacent to the lesion:** Distance to the nearest anatomic structure (structures such as small bowel, colon, ureter, pancreas, gallbladder, and renal hilar vasculature. **
- **Perinephric fat stranding** [None, Present]; **Amount of perinephric visceral fat** [Scant, Abundant]
- **Extension of tumor into perirenal fat, pararenal fascia or ipsilateral adrenal gland:** [None, Present]
- **Kidney location:** [Standard, high, low, ectopic]
- **Kidney size:** [] cm
- **Collecting system:** [Standard, Duplicated]
- **Vessels:** Distance of main renal artery origin to the first branch and to renal hilum, respectively: [] and [] cm; Accessory renal arteries: [None.]; Length from IVC to [right] renal hilum/ from aortic edge to the [left] renal hilum, respectively: [] and [] cm; Accessory renal veins: [None.]
- **Parenchymal variant anatomy:** [Standard, Dromedary hump, Fetal lobulation, Column of Bertin, Renal cleft, congenital fusion / rotation]
- **Benign pathology:** [cysts, stones / calcifications, scars, AML]

Contralateral Kidney:

- **Kidney size:** [] cm
- **Enhancement:** [Normal, Delayed]
- **Pathology:** [cysts, stones / calcifications, scars, AML]

Other:

- **Regional lymphadenopathy** []
- **Distant Metastases** []

T0 No evidence of primary tumour

T1 Tumour 7.cm or less in greatest dimension, limited to the kidney

T1a Tumour 4.cm or less

T1b Tumour more than 4.cm but not more than 7.cm

T2 Tumour more than 7.cm in greatest dimension, limited to the kidney

T2a Tumour more than 7.cm but not more than 10.cm

T2b Tumour more than 10.cm, limited to the kidney

T3 Tumour extends into major veins or perinephric tissues but not into the ipsilateral adrenal gland and not beyond Gerota fascia

T3a Tumour grossly extends into the renal vein or its segmental (muscle containing) branches, or tumour invades perirenal and/or renal sinus fat (peripelvic) fat but not beyond Gerota fascia

T3b Tumour grossly extends into vena cava below diaphragm

T3c Tumour grossly extends into vena cava above the diaphragm or invades the wall of the vena cava

T4 Tumour invades beyond Gerota fascia (including contiguous extension into the ipsilateral adrenal gland)

N – Regional Lymph Nodes

NX Regional lymph nodes cannot be assessed

N0 No regional lymph node metastasis

N1 Metastasis in regional lymph node(s)

M – Distant Metastasis

M0 No distant metastasis

M1 Distant metastasis

Regionaalsed lümfisõlmed: **hilaarsed, parakavaalsed, paraaortaalsed (kõhuaort)**

Ravi

- Kirurgiline ravi
 - Osaline nefrektoomia (avatud, laparoskoopiline)
 - Radikaalne nefrektoomia
 - Ablatsioon
- Väikeste kasvajate korral ka jälgimine
- Immuunravi
- Sihtmärkravi
- **Ravivastuse hindamine immuunravi korral: progressioon vs pseudoproggressioon**

Haigusjuht 60. a M – andmed eemaldatud.

Kasutatud kirjandus

Bosniak Classification of Cystic Renal Masses, Version 2019: An Update Proposal and Needs Assessment.
<https://doi.org/10.1148/radiol.2019182646>

Radiographics: Bosniak Classification of Cystic Renal Masses, Version 2019: A Pictorial Guide to Clinical Use

Radiopaedia: Papillary renal cell carcinoma <https://radiopaedia.org/articles/papillary-renal-cell-carcinoma>

RadiologyAssistant: Cystic masses <https://radiologyassistant.nl/abdomen/kidney/bozniak-2019#definitions-enhancement> David S. Hartman, MD and Ileana Chesaru, MD.

RadiologyAssistant: Kidney solid masses <https://radiologyassistant.nl/abdomen/kidney/solid-masses#renalcellcarcinoma-staging-rcc> Rinze Reinhard, Mandy van der Zon-Conijn and Robin Smithuis

Radiopaedia: renal cell carcinoma <https://radiopaedia.org/articles/renal-cell-carcinoma-1?lang=us>

<https://www.annalsofoncology.org/action/showPdf?pii=S0923-7534%2819%2931157-3>

Vähk Eestis: haigestumus 2019 ja elulemus 2015–2019

https://www.tai.ee/sites/default/files/2022-05/V%C3%A4hk_Eestis_haigestumus_2019_ja_elulemus_2015_2019.pdf

Renal tumor structured reporting including nephrometry score and beyond: what the urologist and interventional radiologist need to know. Naif Alsaikhan,¹ Wael Alshehri, ¹ Fiona Cassidy,^{1,2} Lejla Aganovic,^{1,2} and Noushin Vahdat^{1,2}. Abdom Radiol (2018) <https://doi.org/10.1007/s00261-018-1691-0>

CT renal mass protocols v1.0 Society of Abdominal Radiology Disease Focused Panel on Renal Cell Carcinoma
<https://abdominalradiology.org/wp-content/uploads/2020/11/RCC.CTprotocolsfinal-7-15-17.pdf>

Tänan!