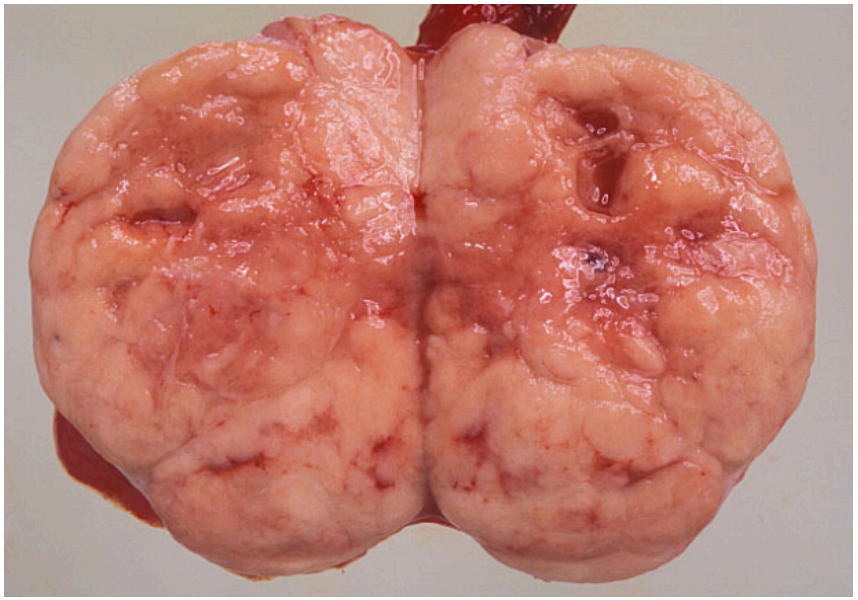
Advanced Histopathology
FRCPath Part 2 Examination Course

UROPATHOLOGY
2020

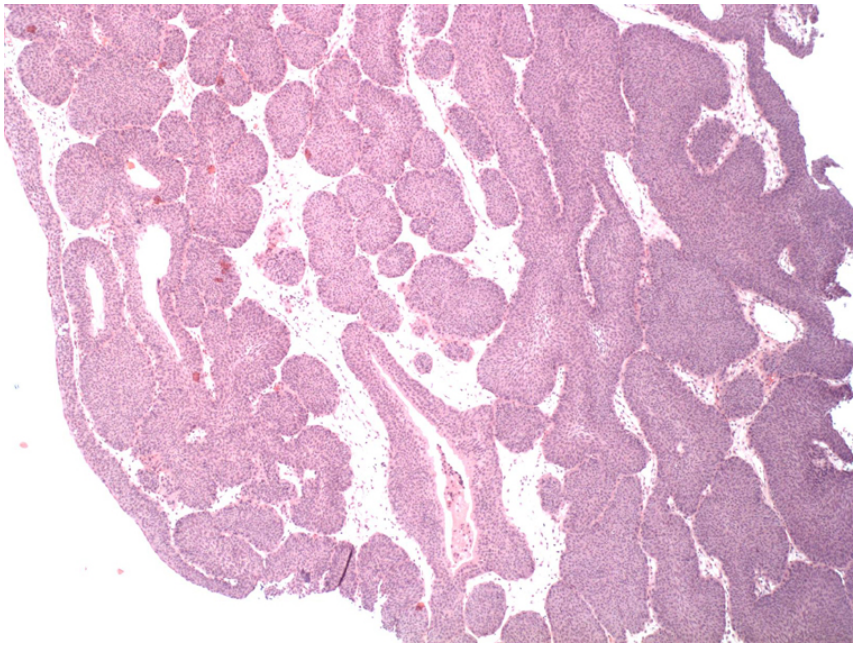


Dr Anne Warren
Cambridge University Hospitals
NHS FT

Bladder

B16

- Male 53yrs
- 2cm bladder neck polyp on narrow stalk



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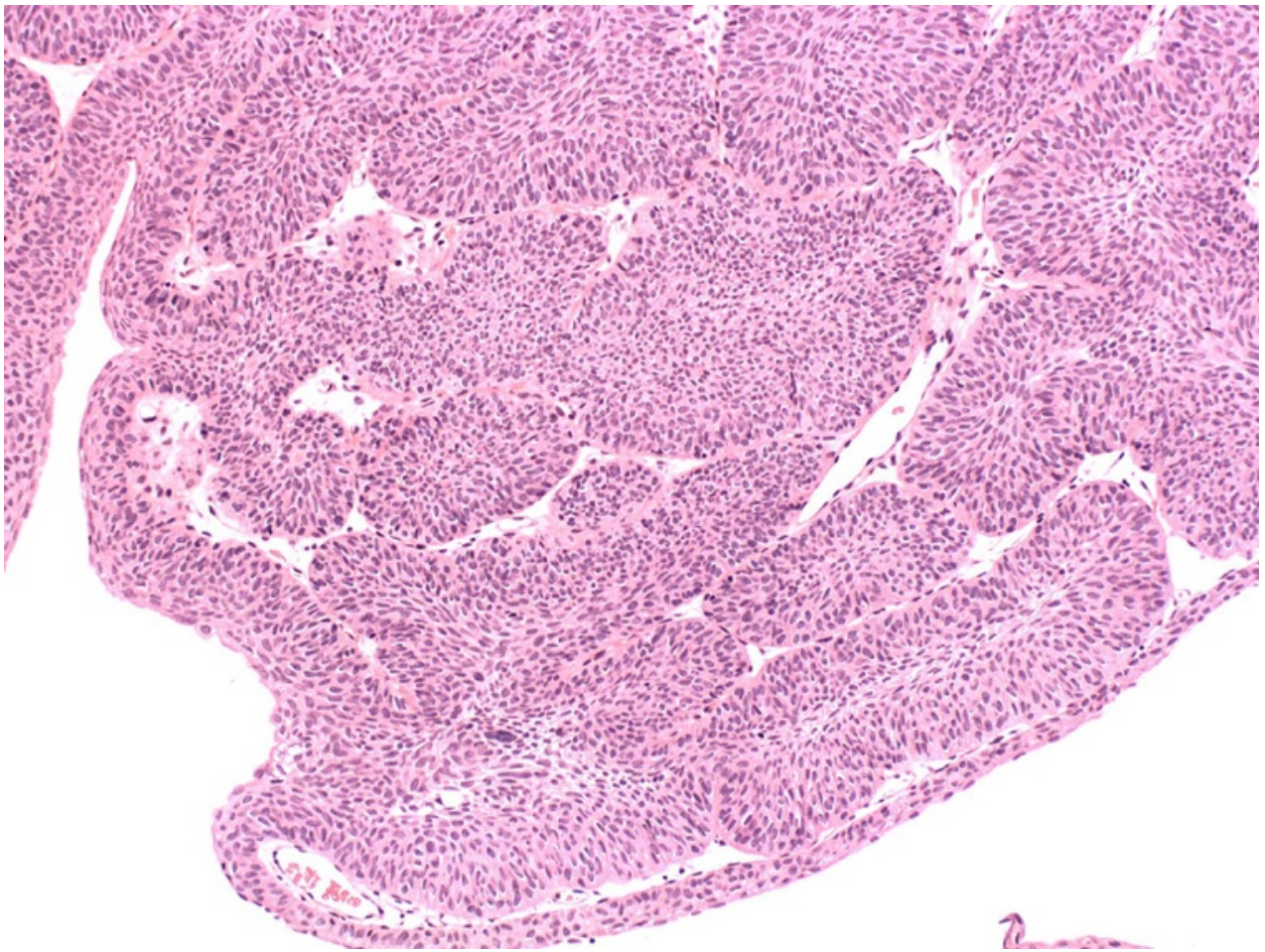

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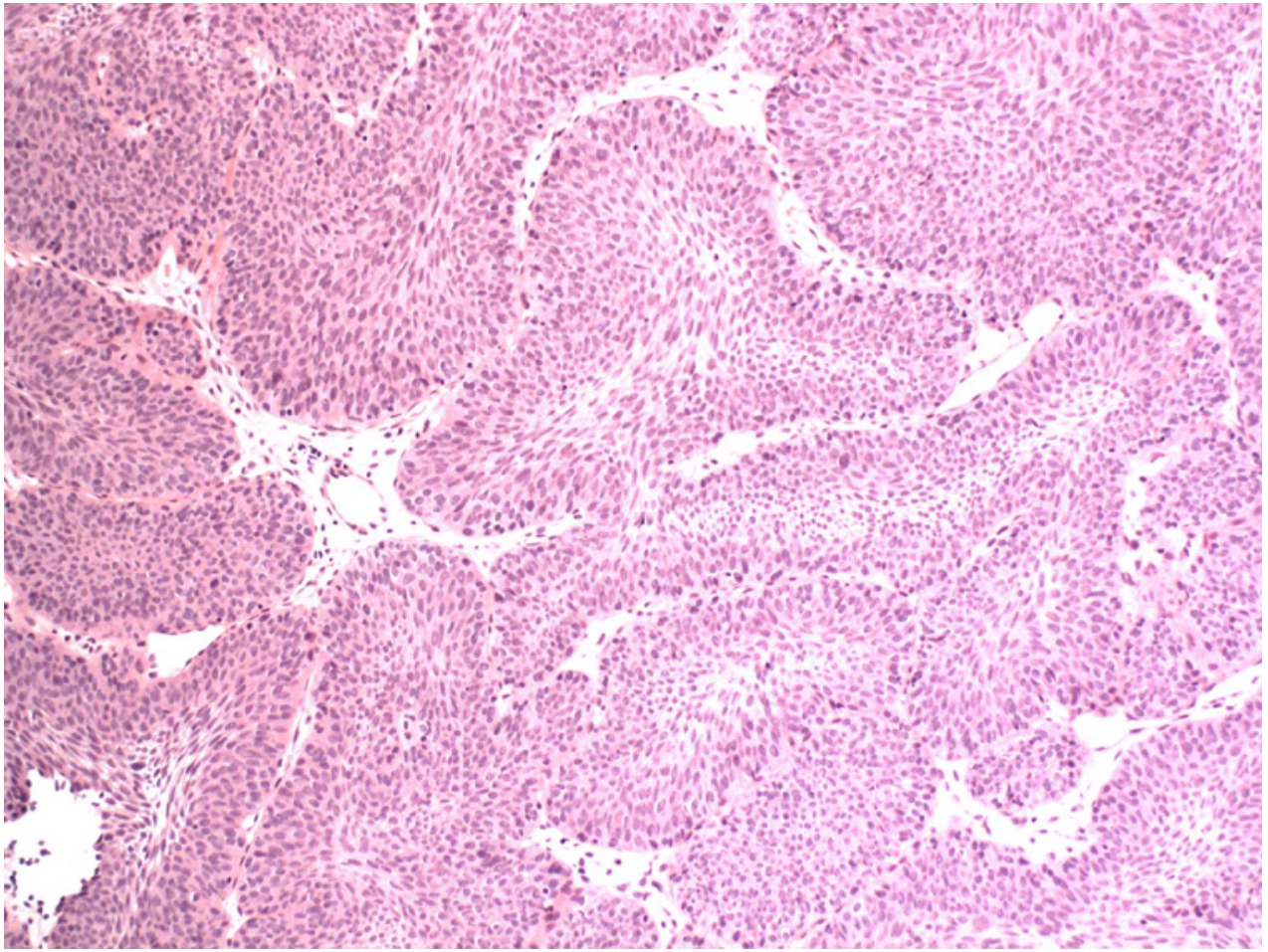

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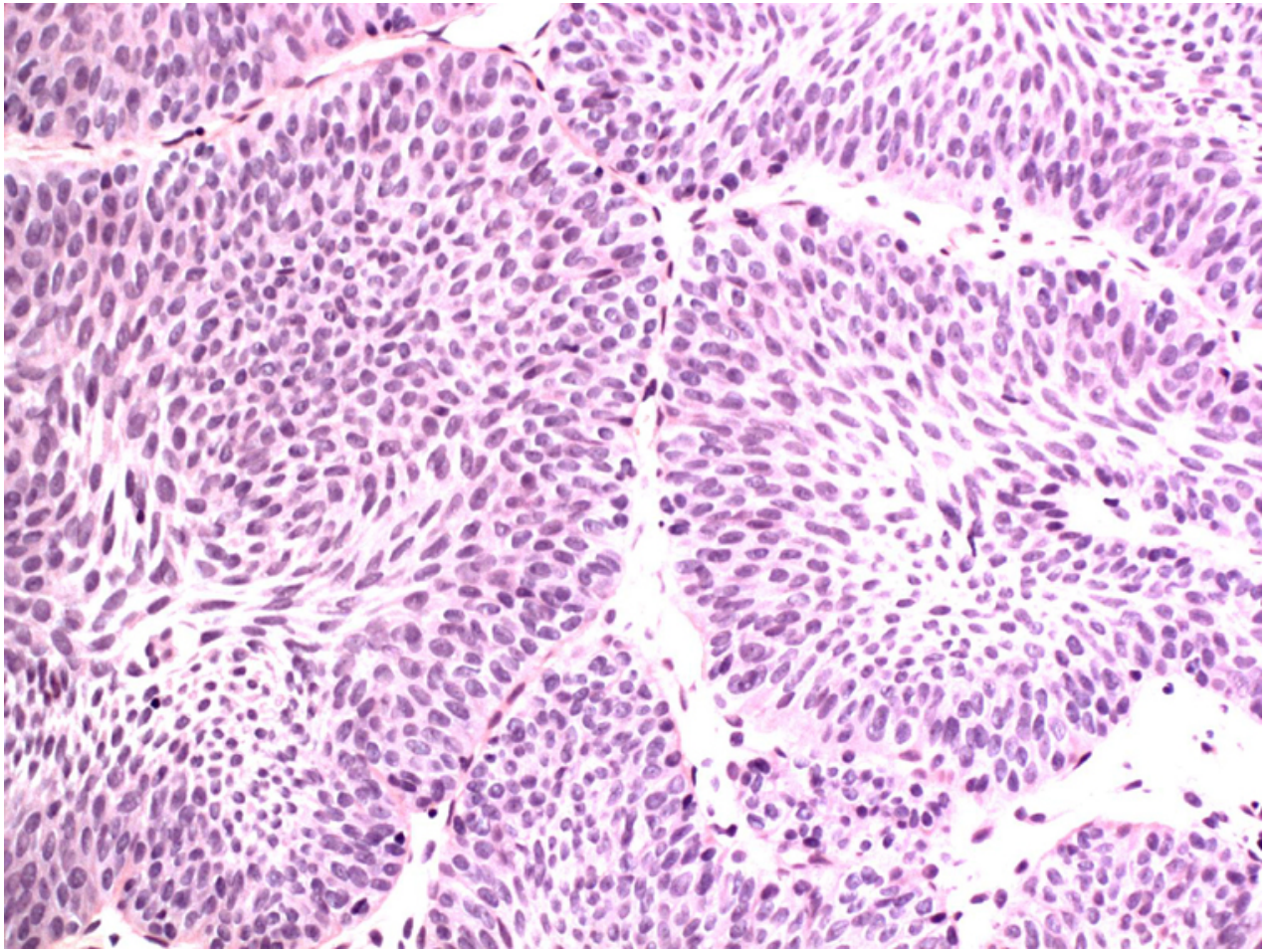


B16

Inverted urothelial papilloma

- Uncommon, Male>Female; wide age range, usually >50yrs
- Any site in urinary tract – mostly trigone/ bladder neck

- Haematuria
- Sessile or on a stalk at cystoscopy

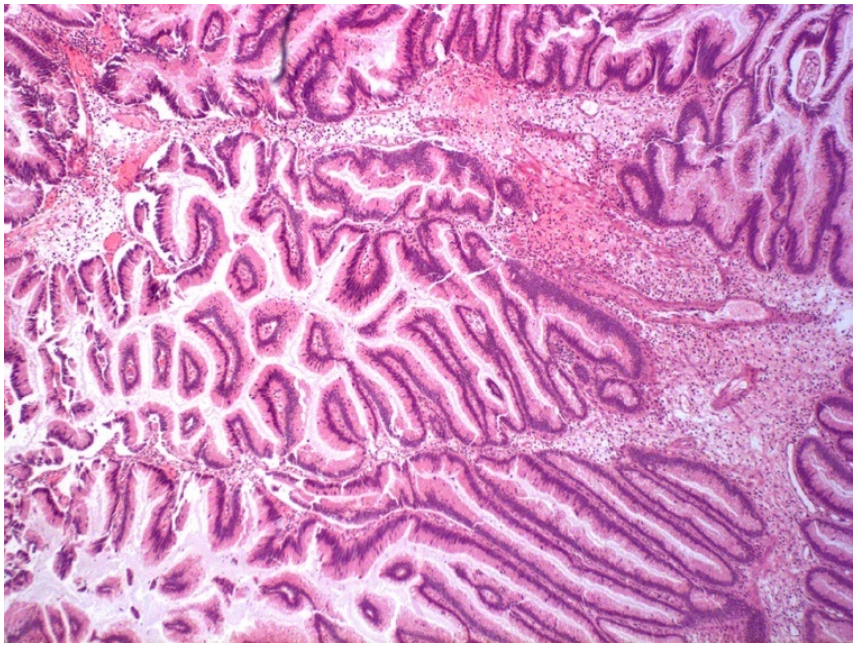
- Rare papillary and inverted mixed pattern
- Rare recurrence (<1%)

DD

- Urothelial carcinoma, endophytic or nested
- Florid von Brunn nests

B4

- Male 84 yrs
- Bladder TURBT



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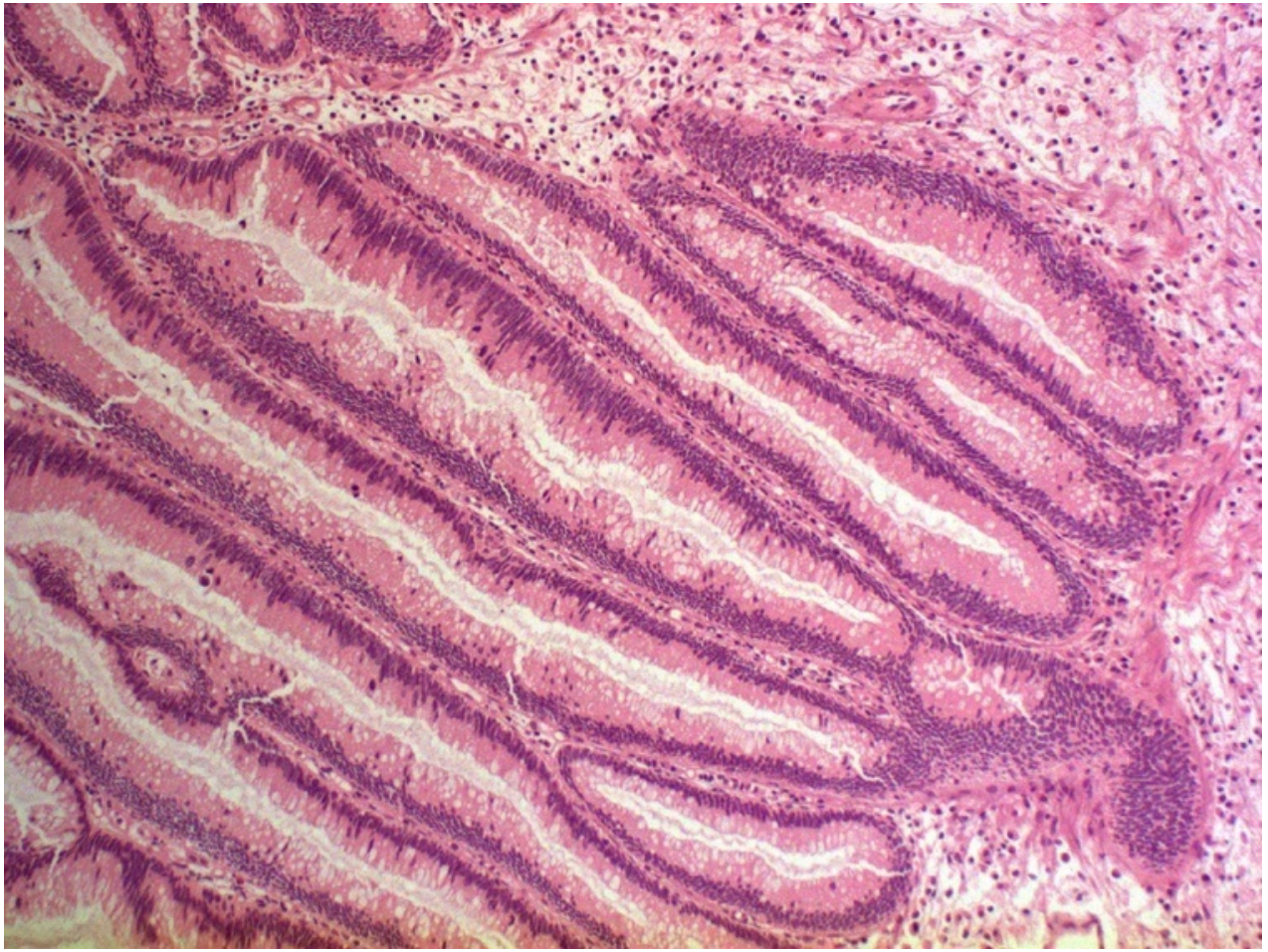


B4

Villous adenoma

- Rare; Male>female; wide age range - mean 65ys
- Haematuria, irritative symptoms, rare mucosuria

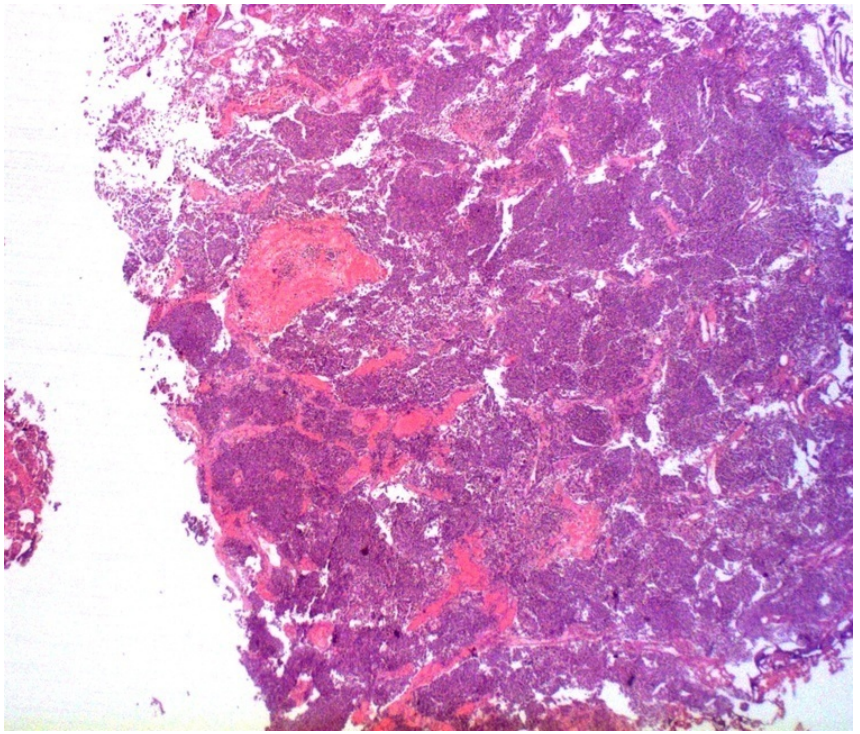
- Dome, trigone, urachus most often
- Identical to colorectal adenomas; enteric immunoprofile
- May progress to invasive adenocarcinoma
- All embed and exclude invasion; rule out rectal carcinoma

DD

- Colorectal or endometrial adenocarcinoma
- Urothelial carcinoma with glandular differentiation
- Cystitis glandularis with intestinal metaplasia

B14

- Male 75yrs
- Bladder TURBT



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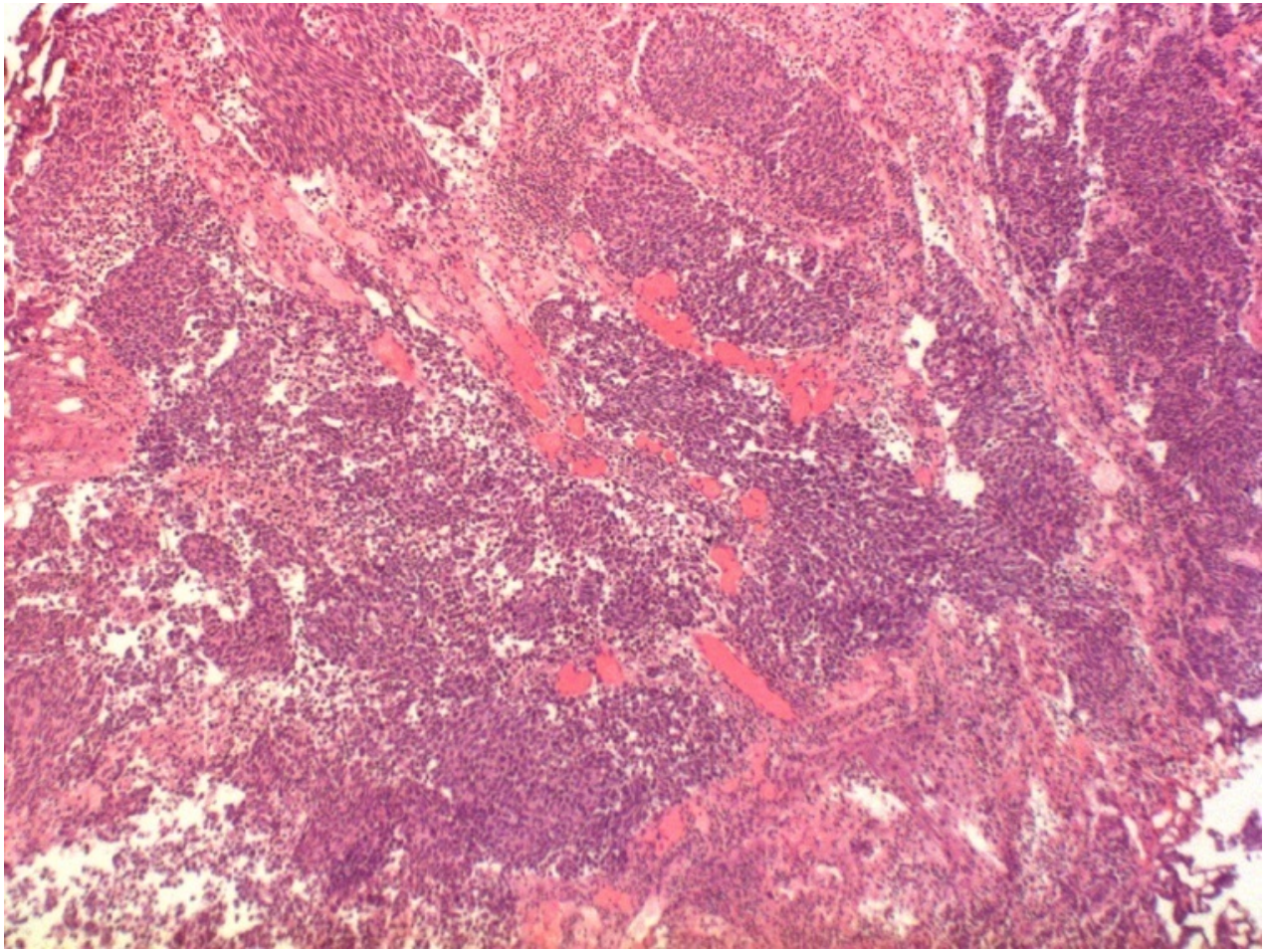

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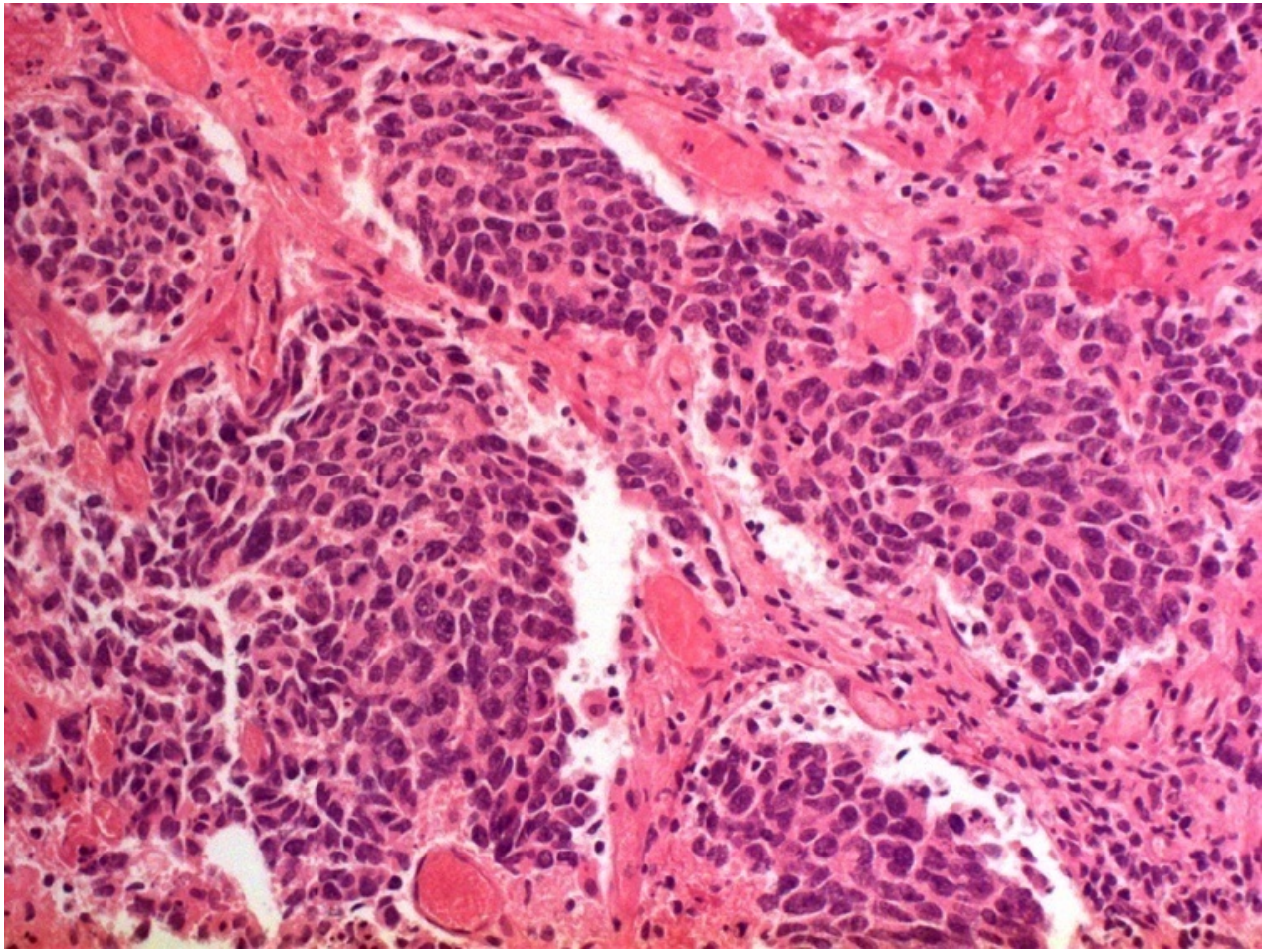

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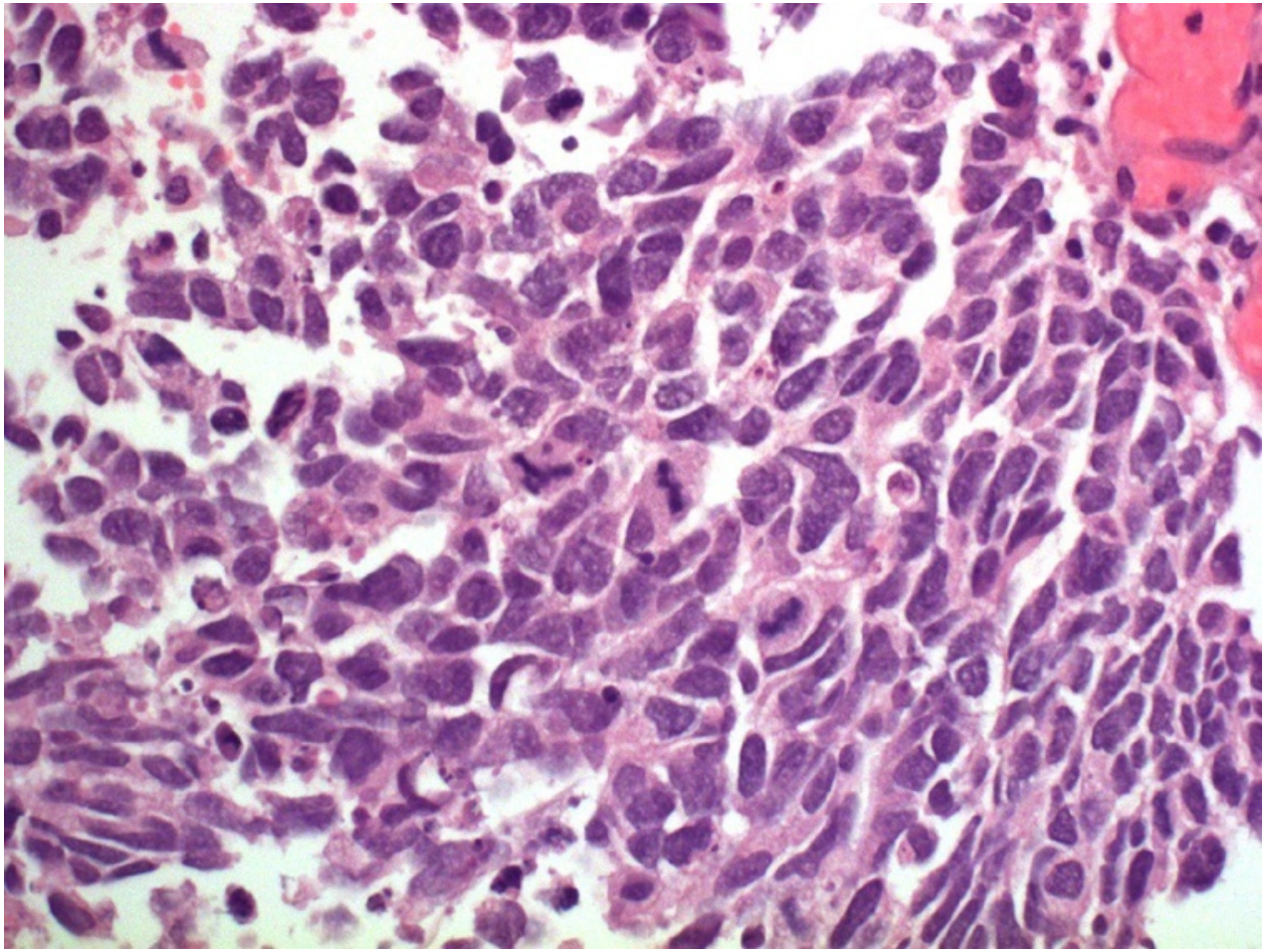


B14

Small cell neuroendocrine carcinoma

- Uncommon; Male >>> Female; mean 69yrs
- Gross haematuria
- Paraneoplastic syndromes (eg ACTH)
- Aggressive – 50% metastases at diagnosis

- May be admixed with other types of urothelial carcinoma, in-situ or invasive (50%), less often SqCC, adenoCa
- Diagnose on morphology, even if typical neuroendocrine IHC is negative (CD56, CrGA, Synapto, NSE etc)
- Give % and call SCC with associated UC

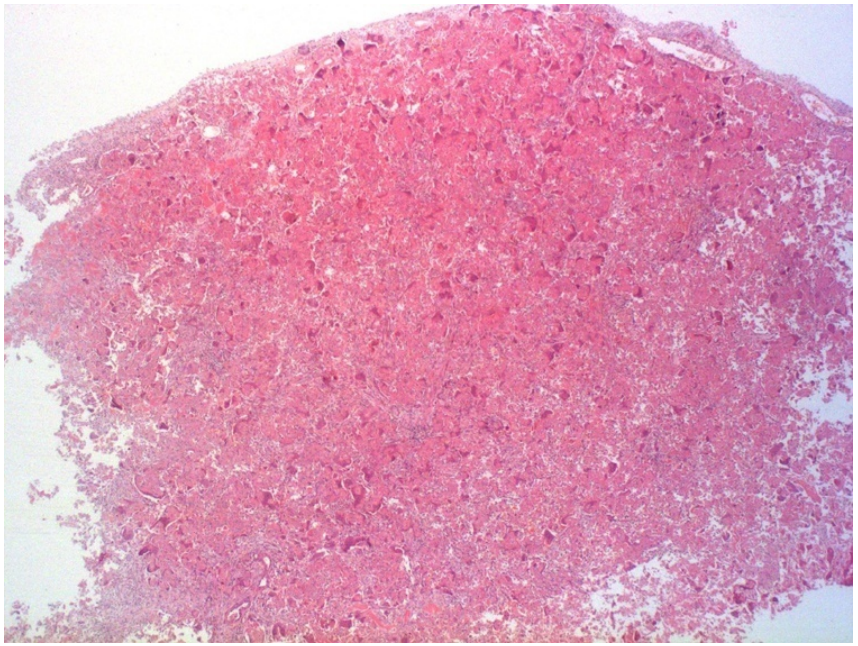
B14

DD

- Metastatic SCC (primary bladder SCC may be TTF-1 +)
- Prostatic adenocarcinoma
- Lymphoma
- Poorly differentiated UC (Synapt- CrG-)

B10

- Male 63yrs
- ? Prostate cancer involving bladder
- Bladder TURBT



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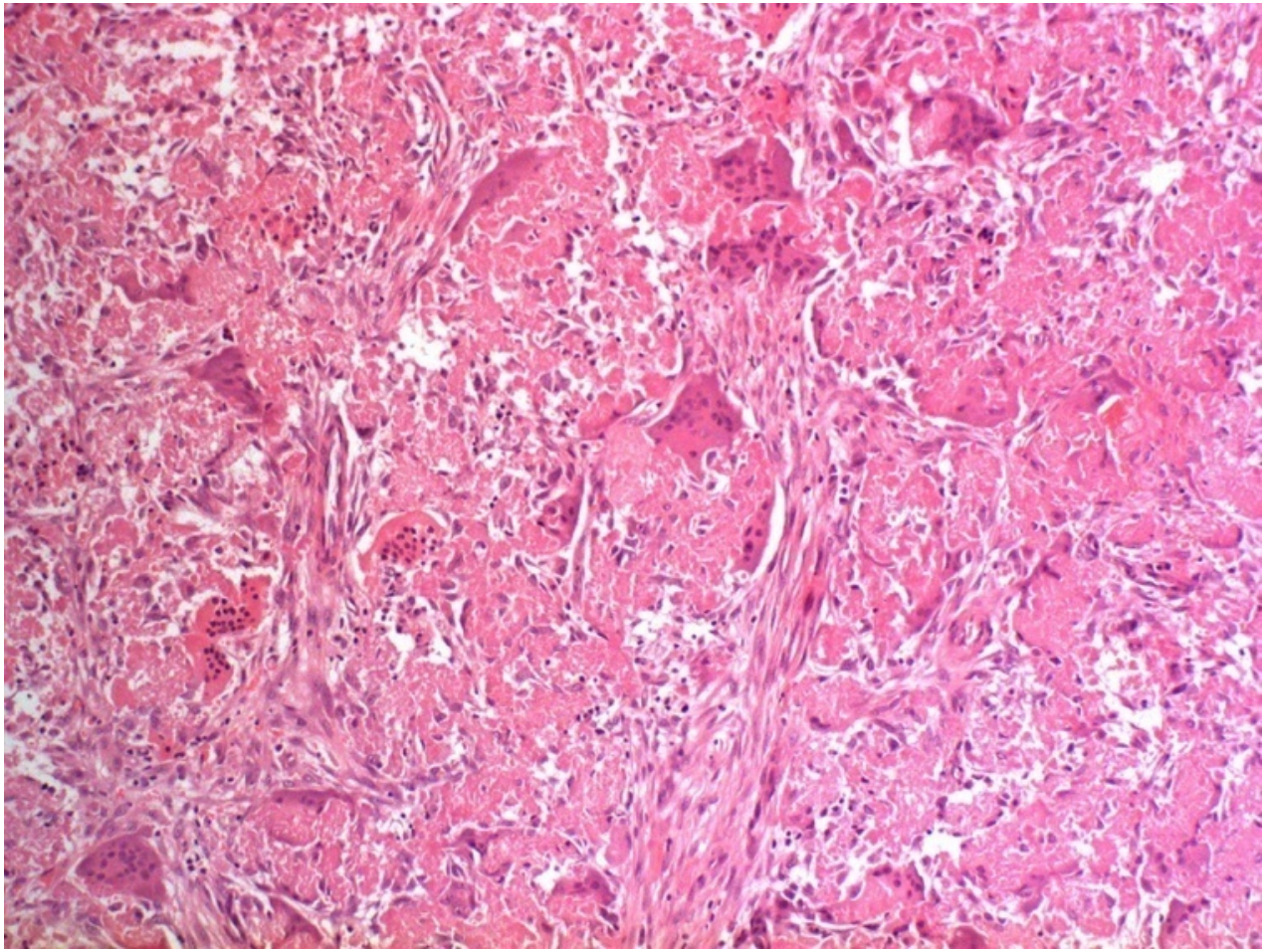

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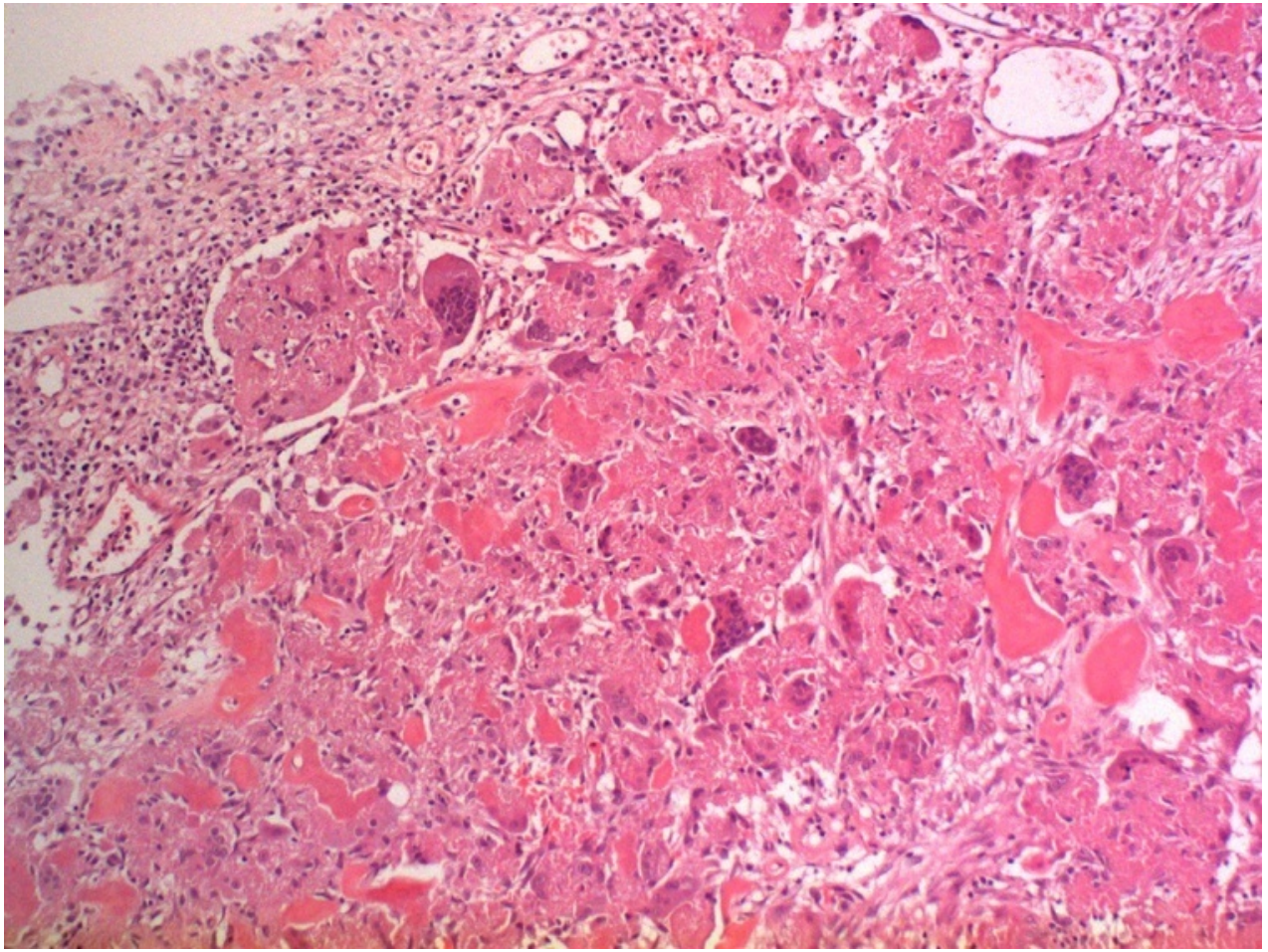

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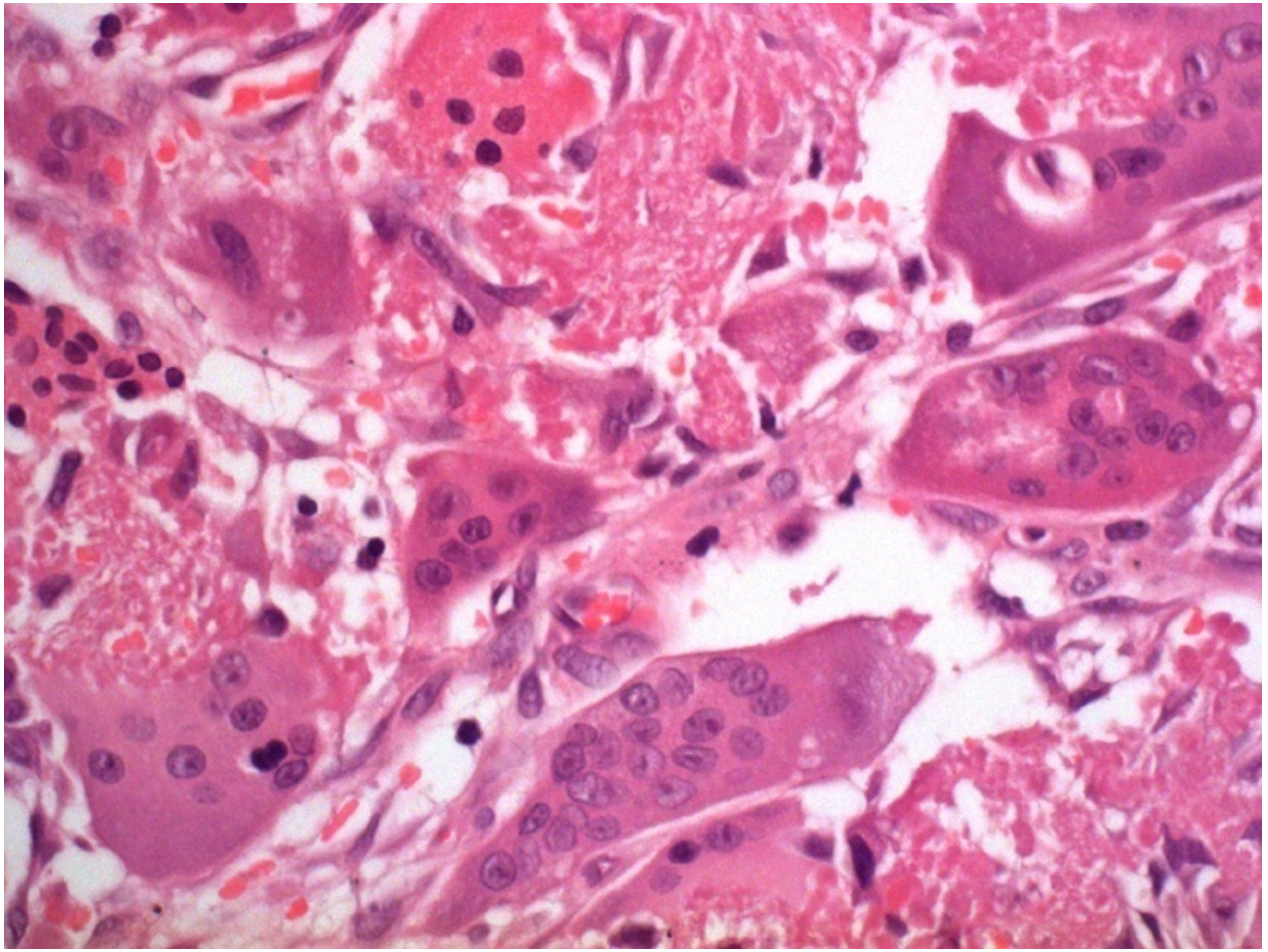


B10

Amyloidosis with florid foreign body giant cell reaction

- Rare, >50yrs
- Haematuria, may produce a mass
- Posterior and lateral walls commonly

- Primary localised (usually AL-type) or systemic (AA-type) – clinico-pathological correlation
- Vessel wall involvement usually systemic
- High local recurrence if primary
- Referral to national amyloidosis centre

DD

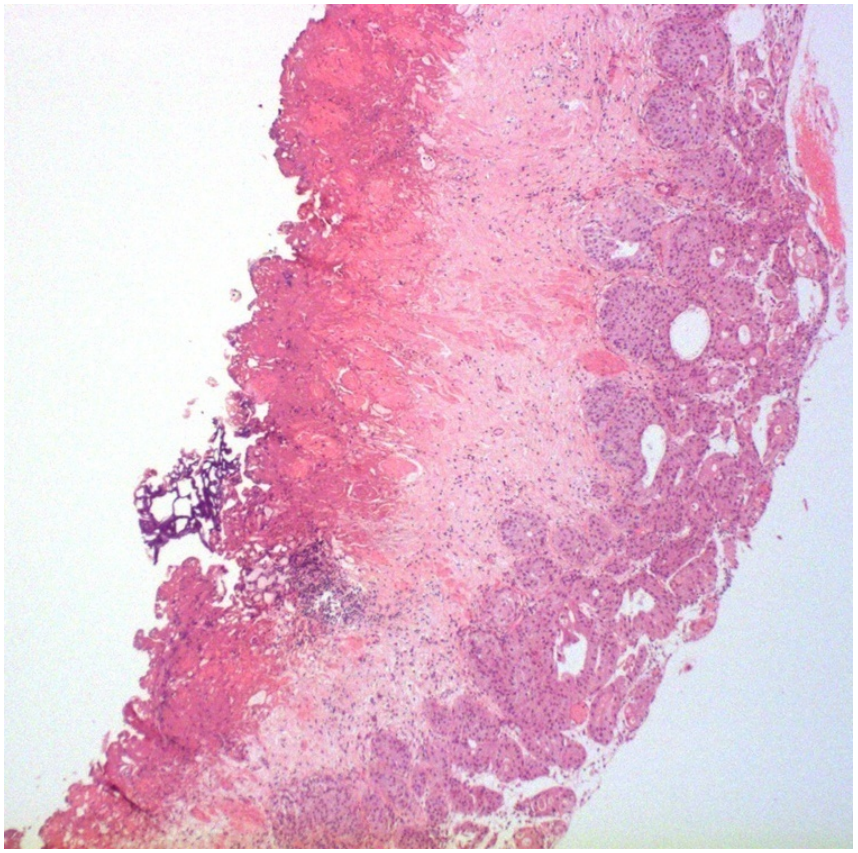
- Fibrosis
- Lymphoma

B6

- Male 65 yrs

- Previous G2 pT1 UC
- Red patch RUO

- Bladder TURBT



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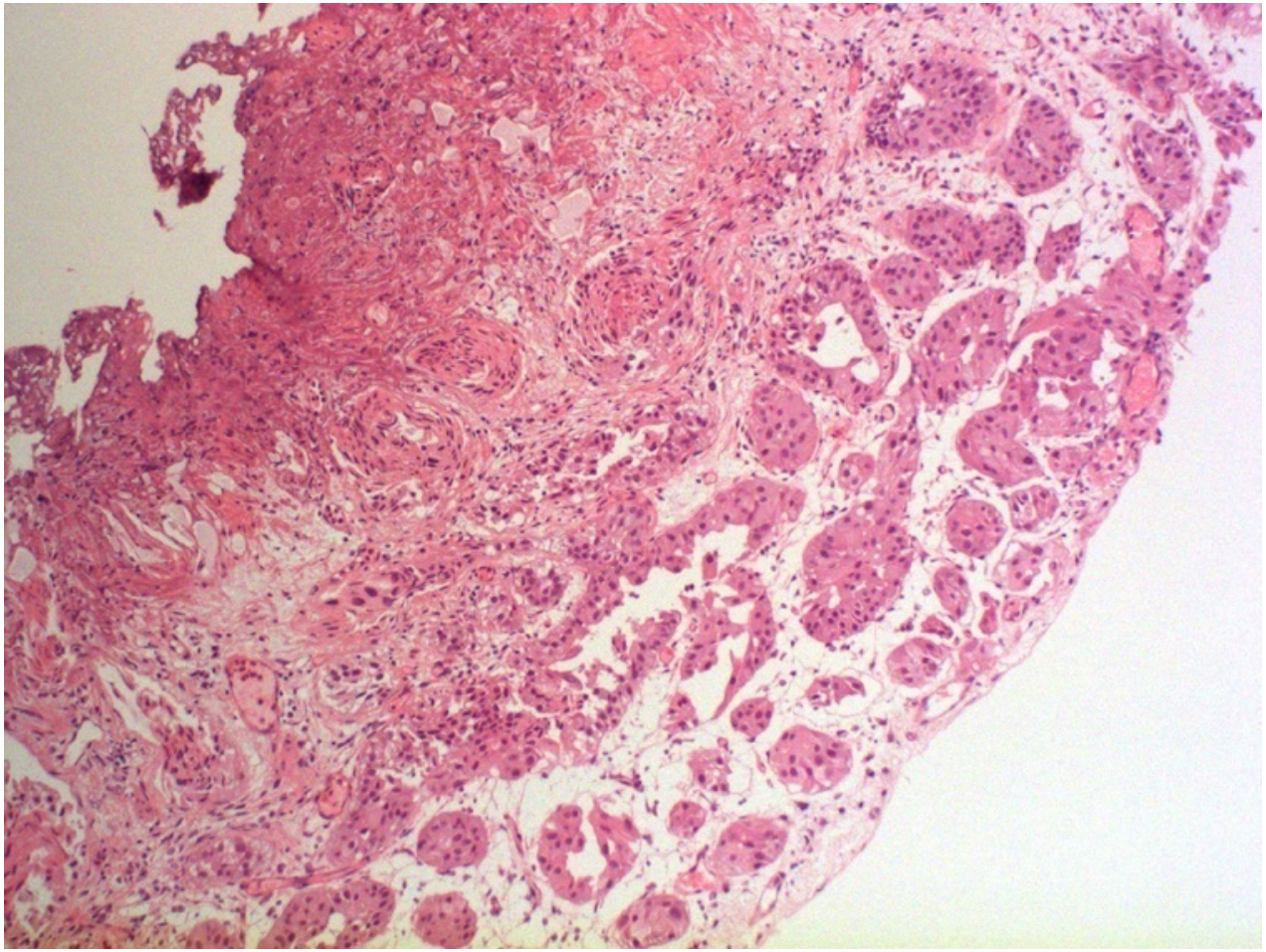

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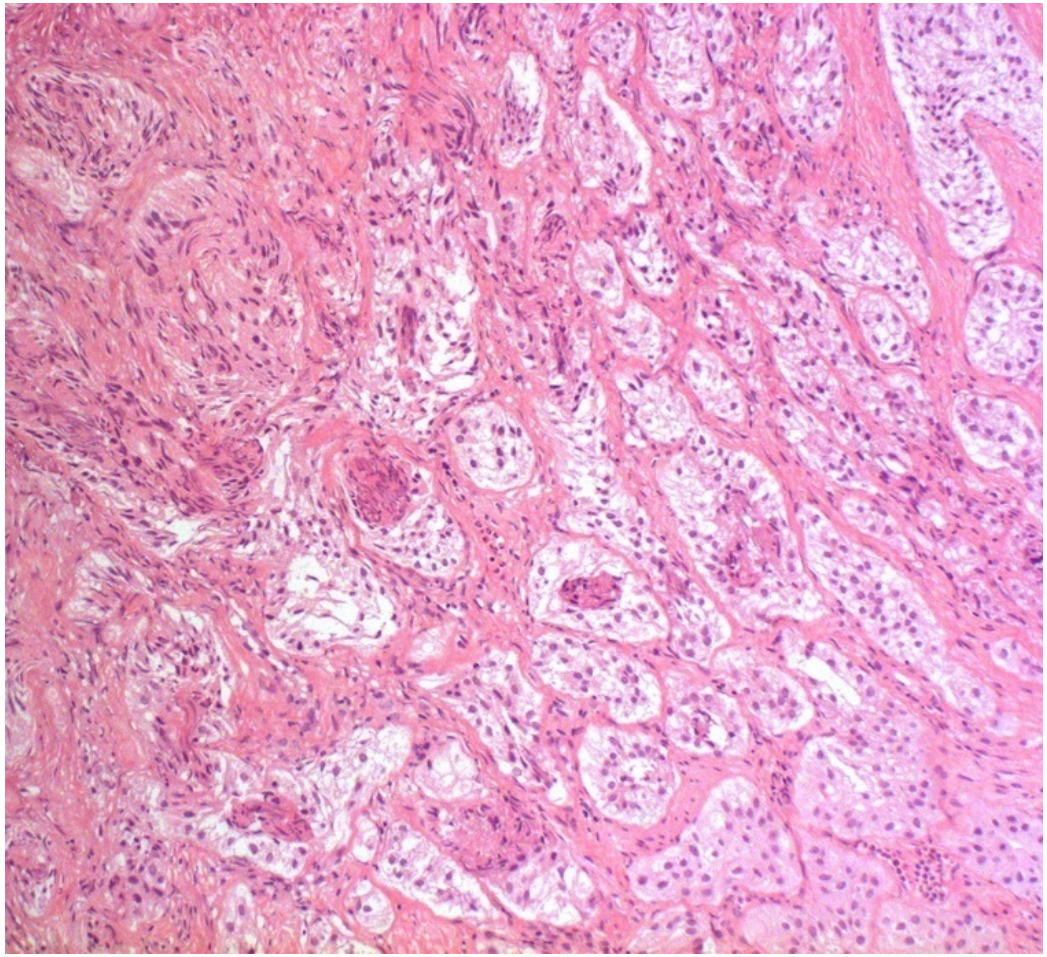

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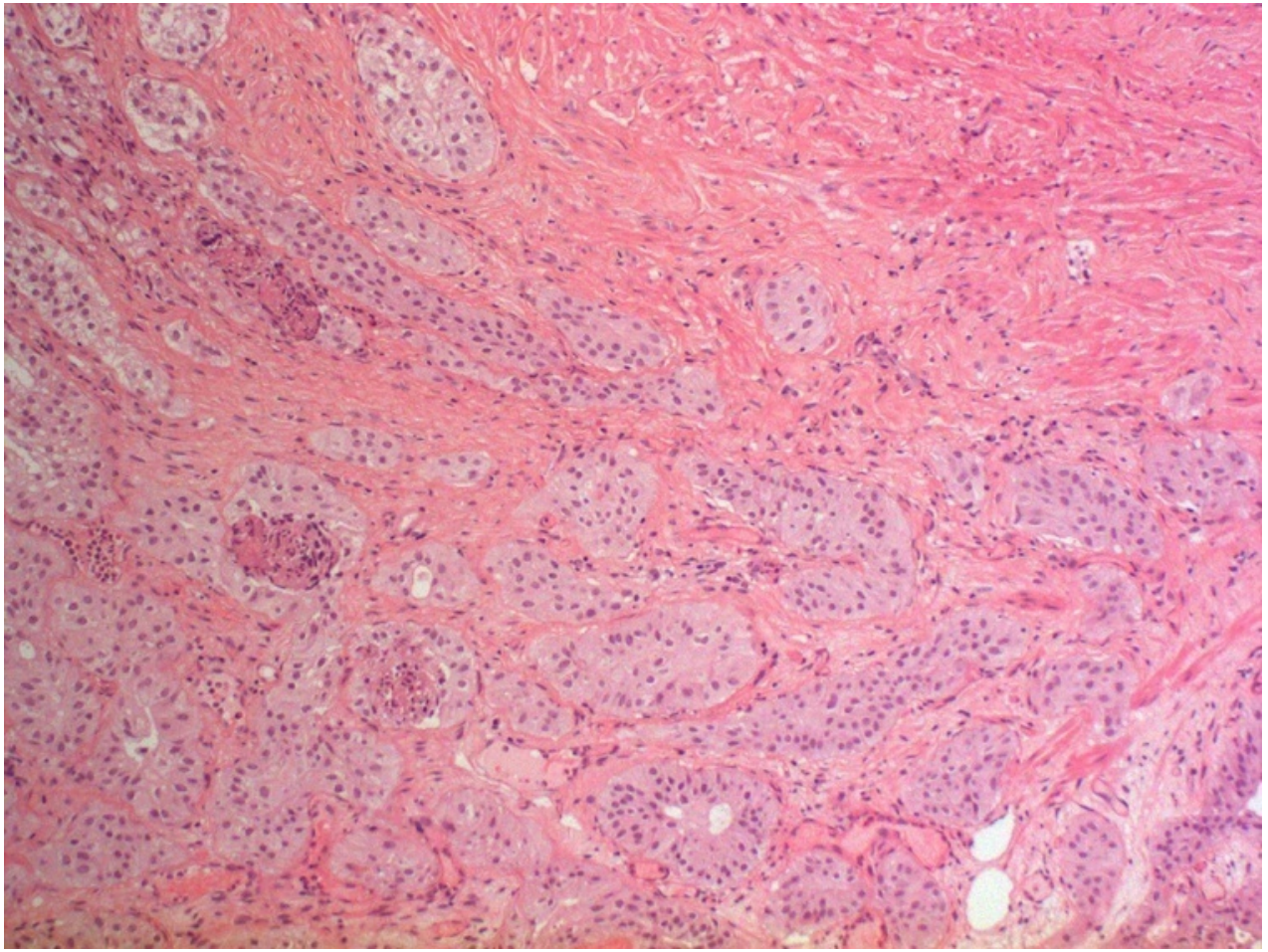

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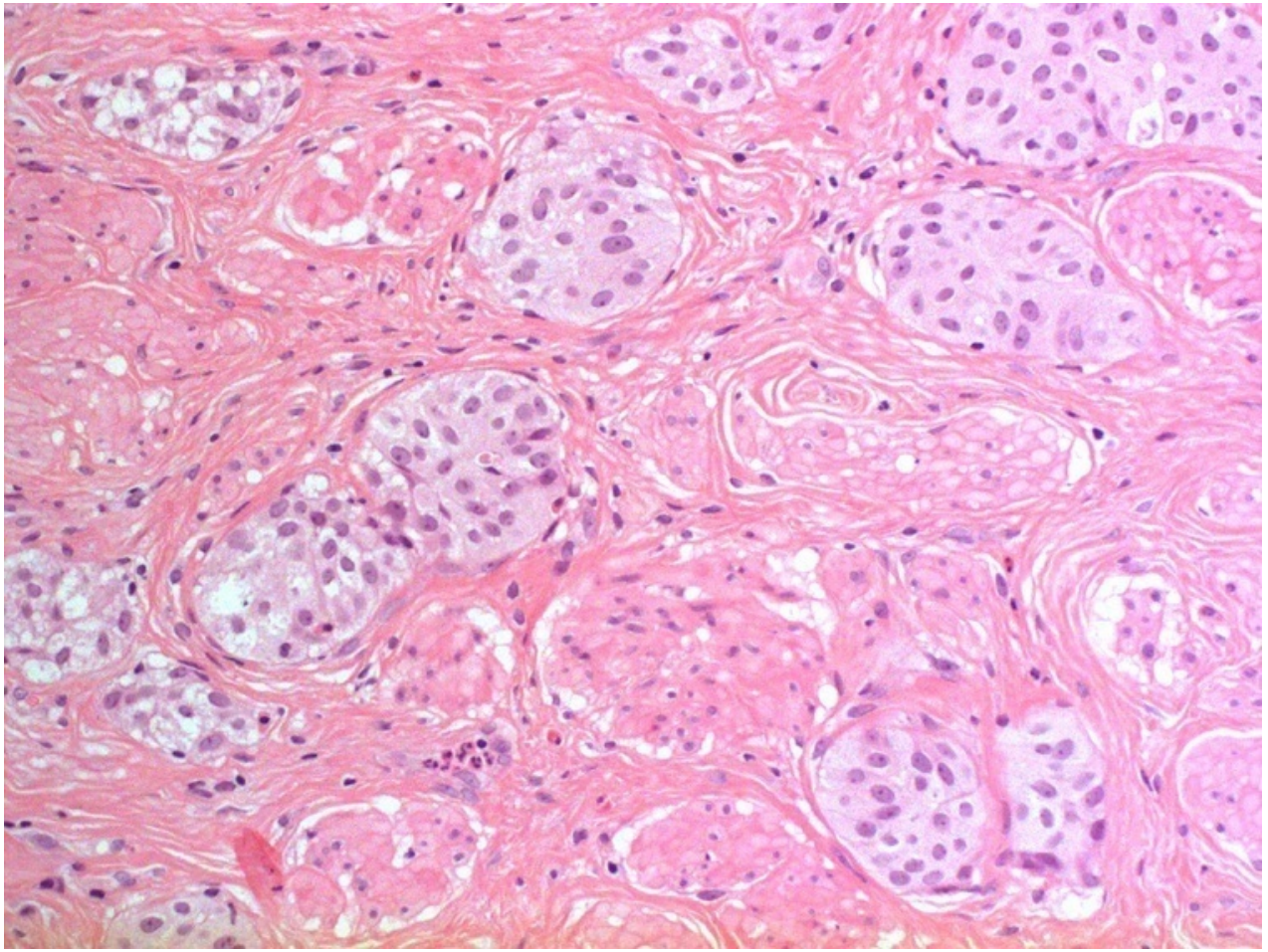


B6

Urothelial carcinoma – nested variant, pT2 at least

- Male >>female

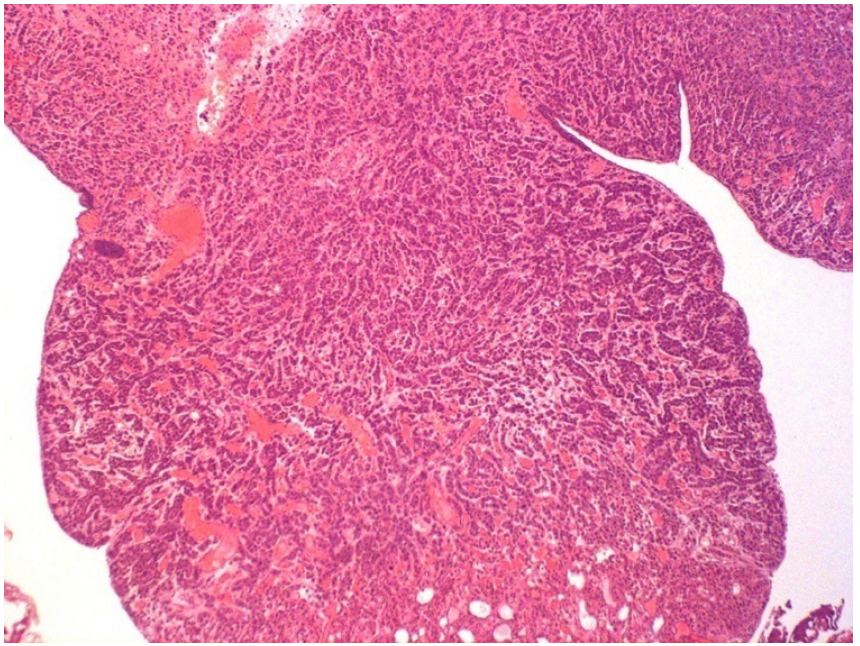
- Irregular infiltrative border with deep extension
- Anastomosis of crowded nests, DEEP
- Bland, with atypia in deeper areas
- May be mixed with small tubular UC pattern
- Aggressive
- Advise clinicians – esp if no muscle in a pT1 TURBT specimen

DD

- von Brunn nests
- Cystitis cystica/glandularis

B2

- Female 55yrs
- Bosselated wide-based tumour bladder base
- Bladder TURBT



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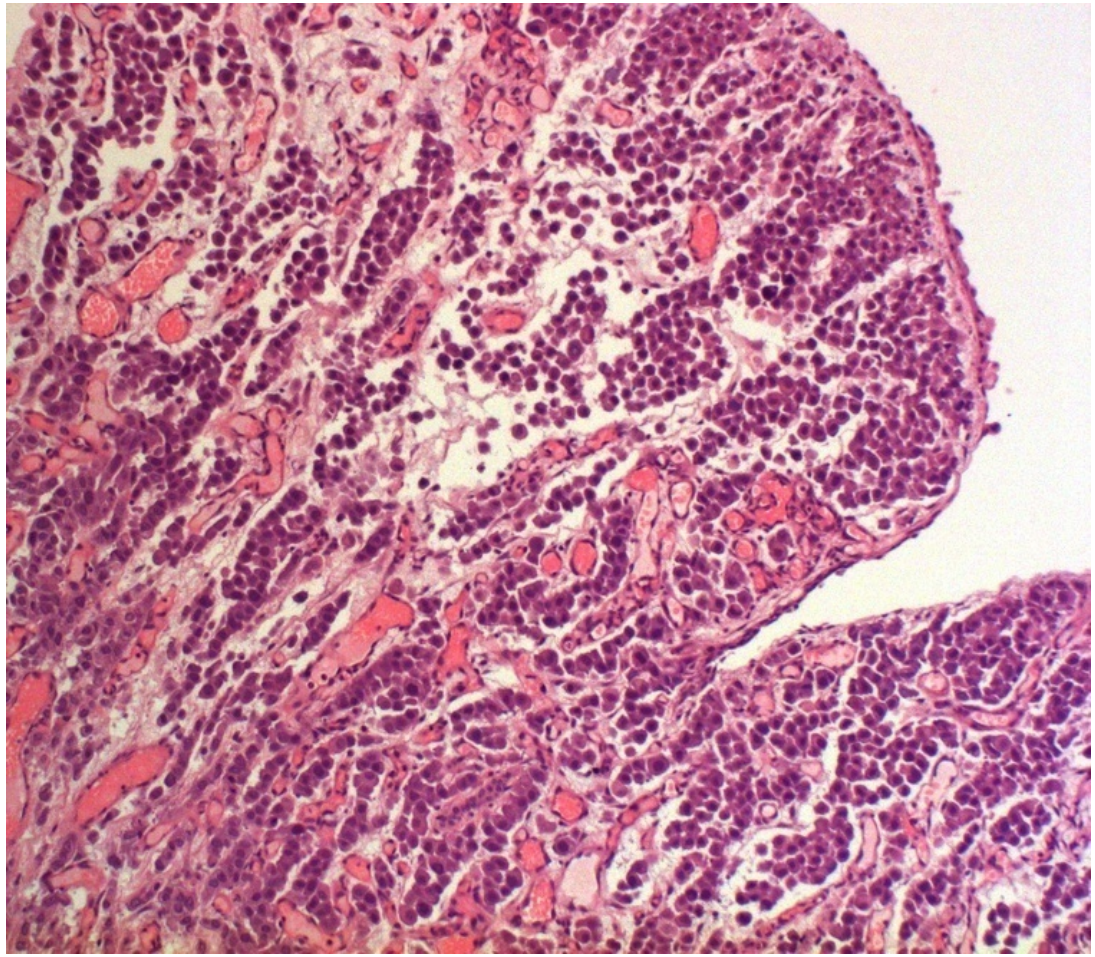

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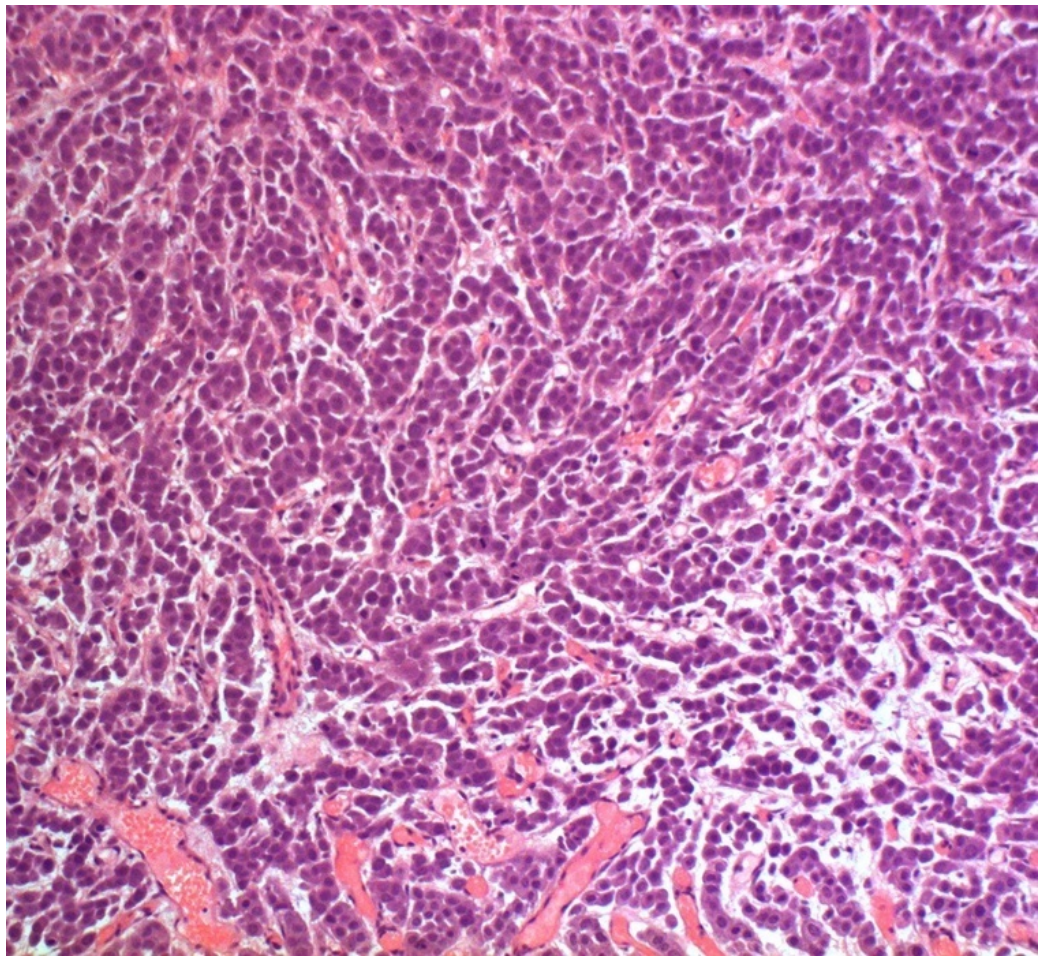

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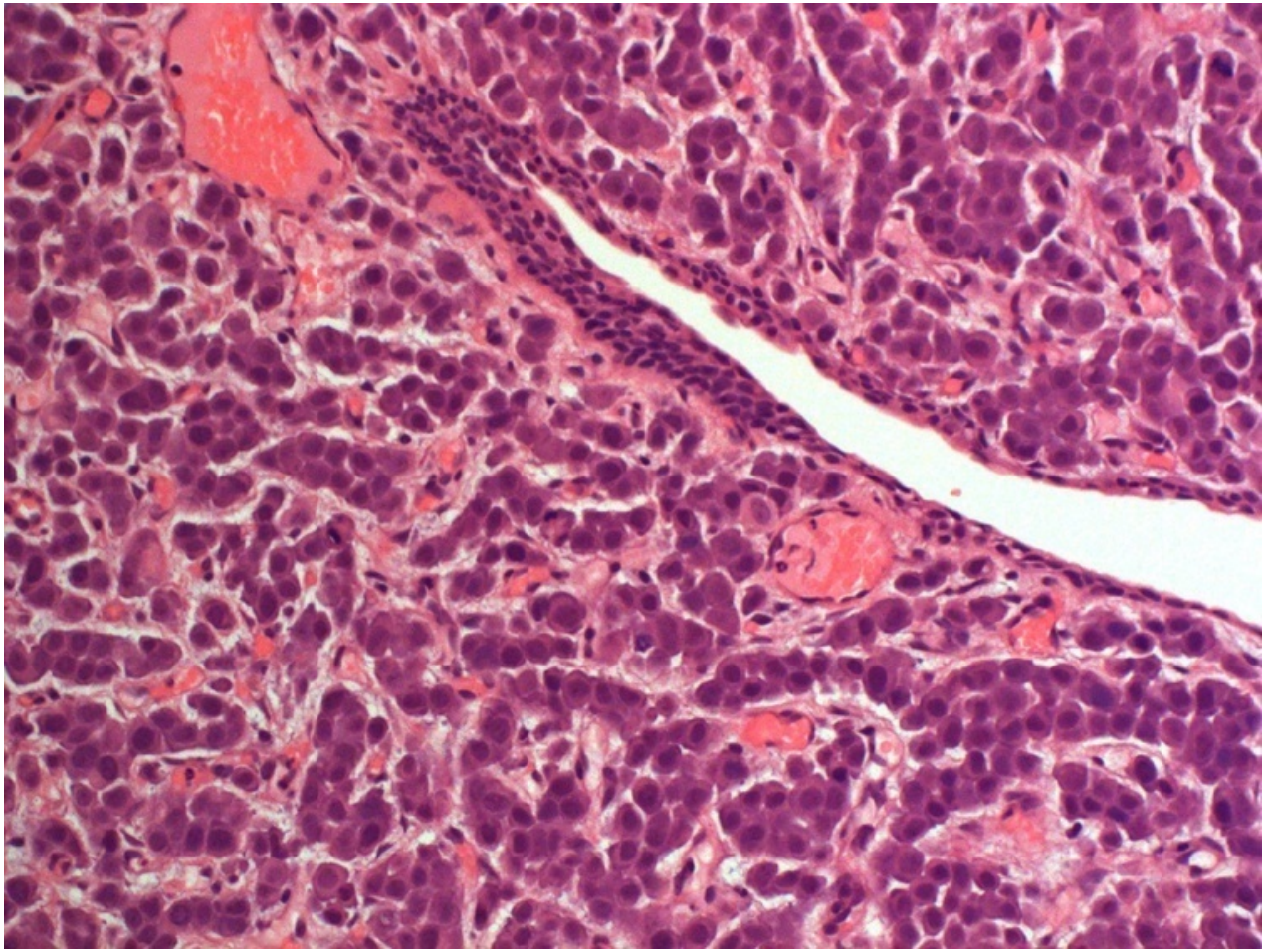

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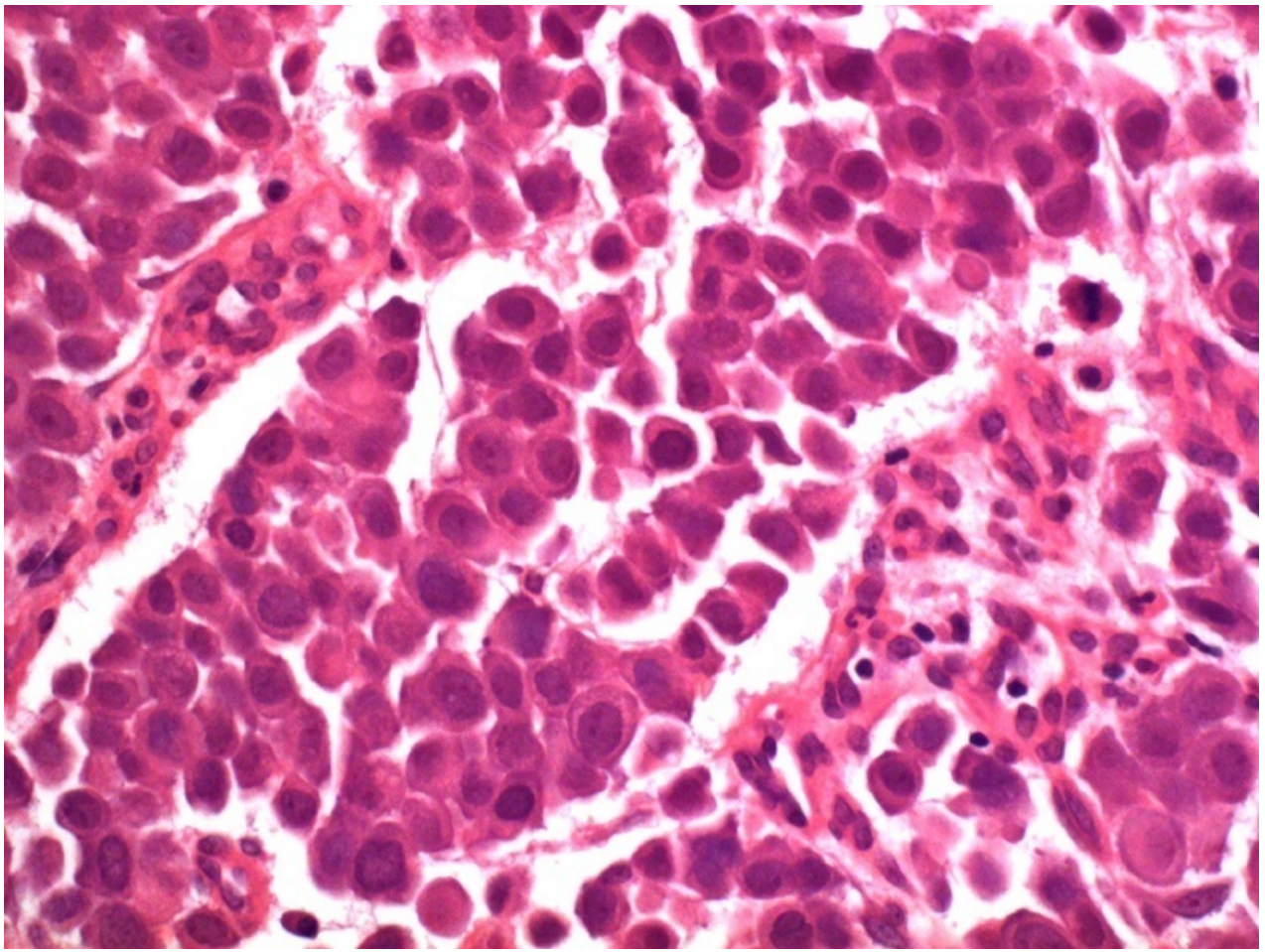


B2

Metastatic carcinoma of the breast (lobular)

- Metastases often at bladder neck or trigone
- p63/HMWCK ++ favours UC; ER/PR ++ favours Br Ca

DD

- UC with glandular differentiation
- Plasmacytoid UC
- Lymphoma-like UC carcinoma
- Adenocarcinoma of bladder
- Micropapillary UC

B2

Clues with metastases

- Multiple nodules
- No CIS
- Undermining of normal urothelium
- Muscle involvement only
- Unusual morphology
- Vascular invasion++

- Clinical history
- Compare with previous histology

B27

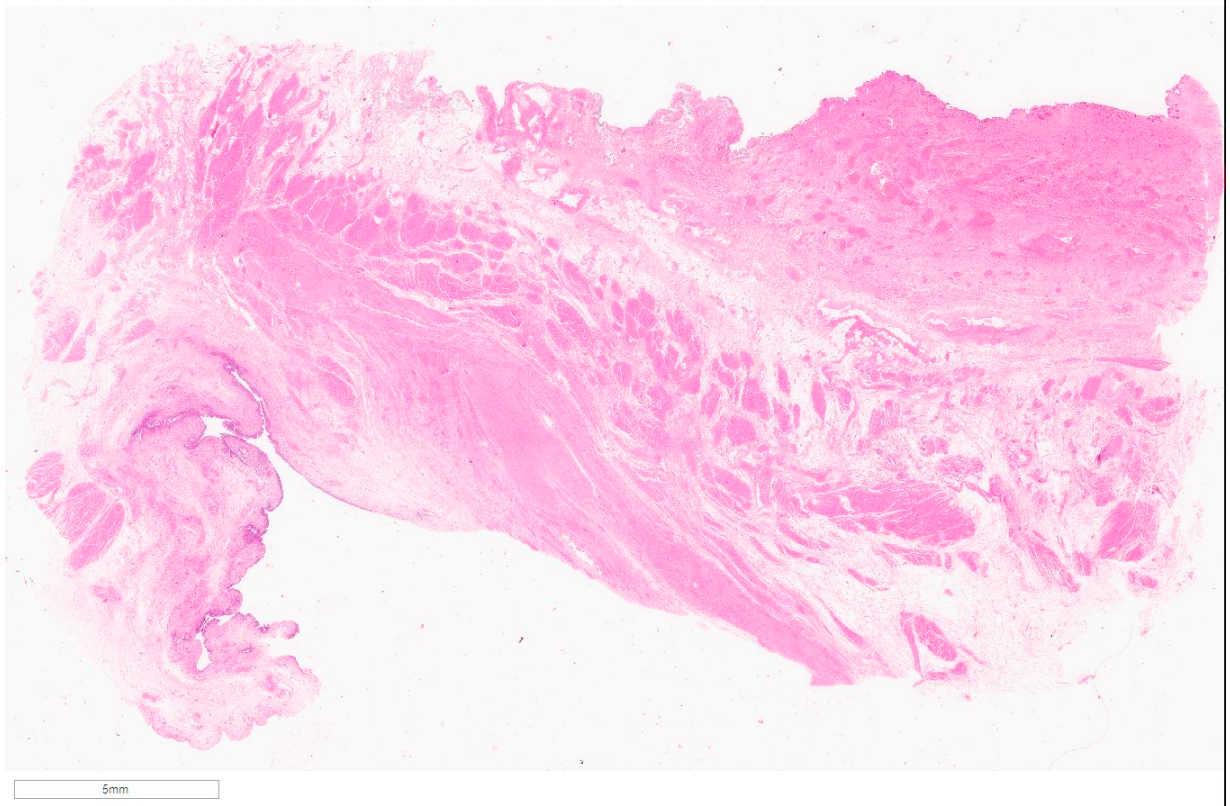
Female, 61 years

Cystectomy post-BCG treatment for UC G3 pT2

No obvious tumour macroscopically.

Section of bladder wall.

B27



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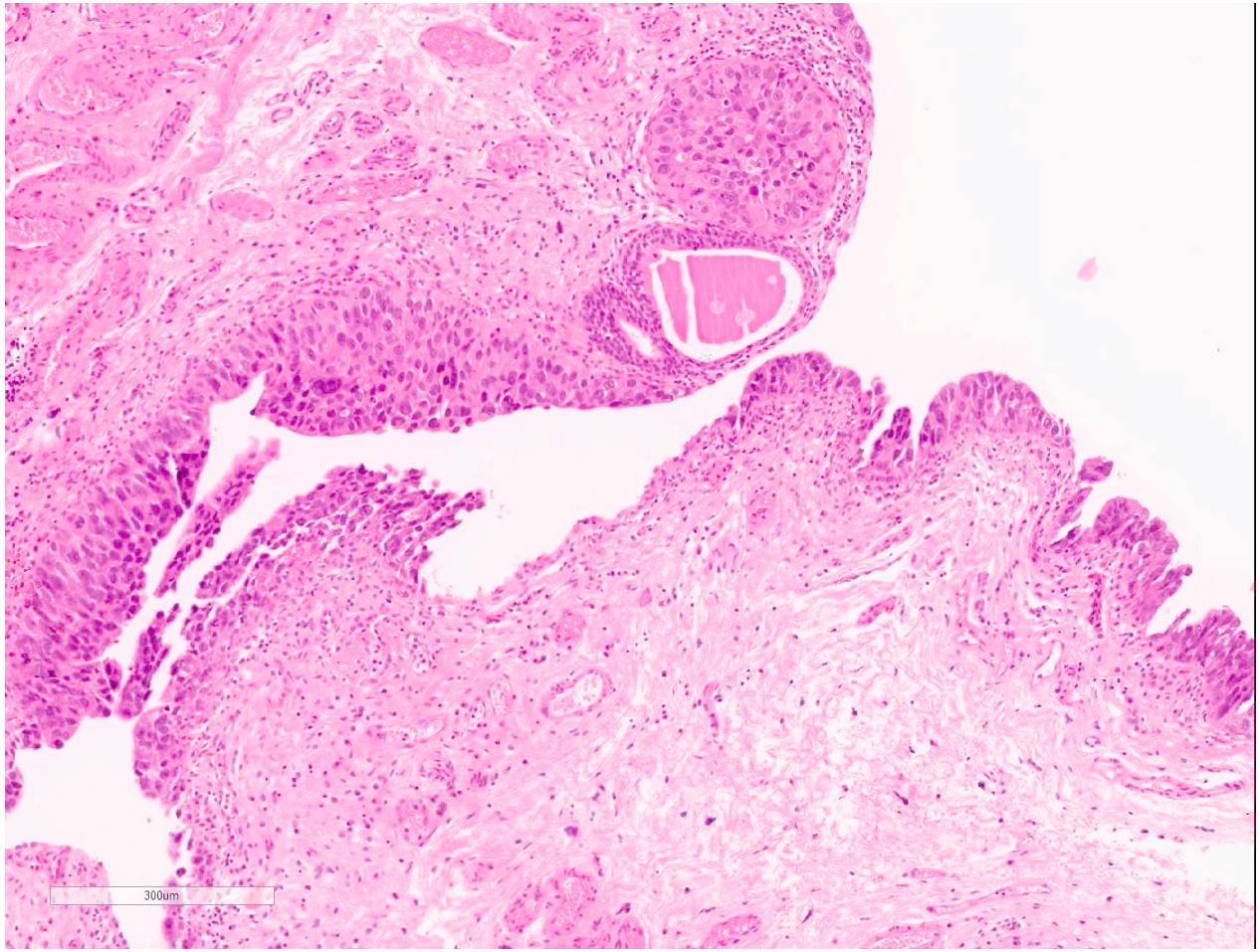

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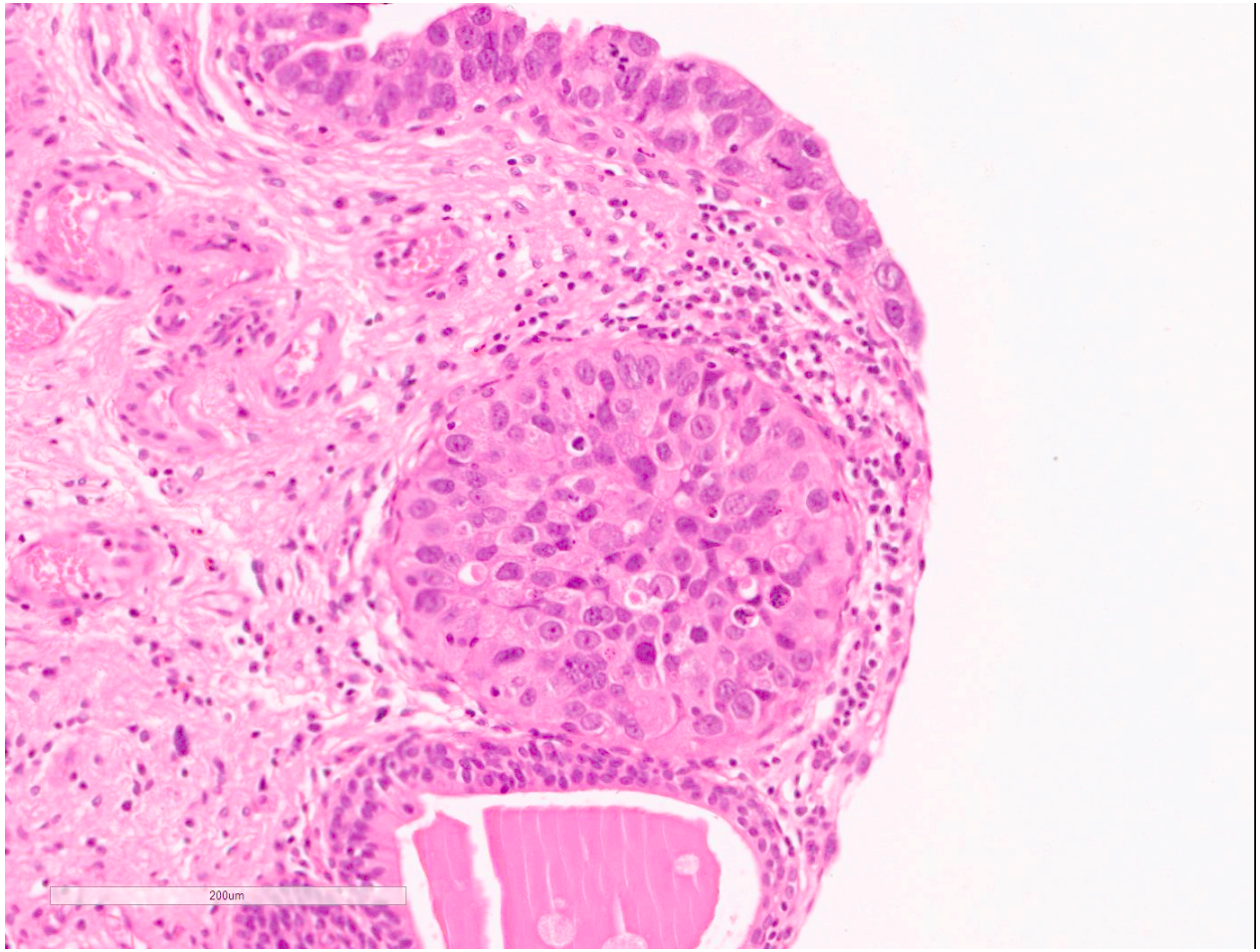


B27

Flat carcinoma in-situ

Extension into von Brunns nests (not invasion)

IHC: Diffuse CK20+, increased MIB-1

(Also had UC G3 pT2b)

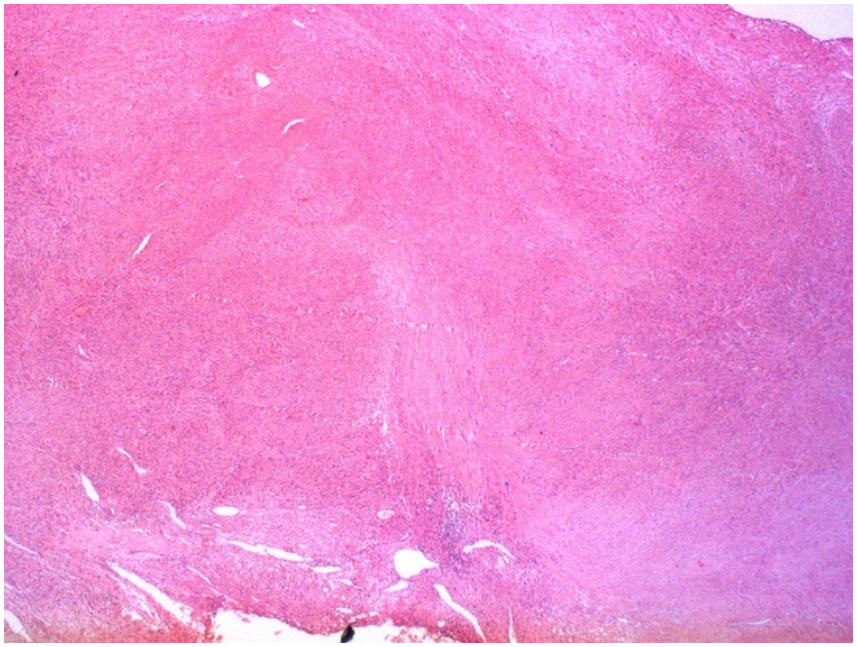
DD

Reactive atypia

Post-treatment atypia

B13

- Female 59yrs
- Large bladder tumour ? haemangioma



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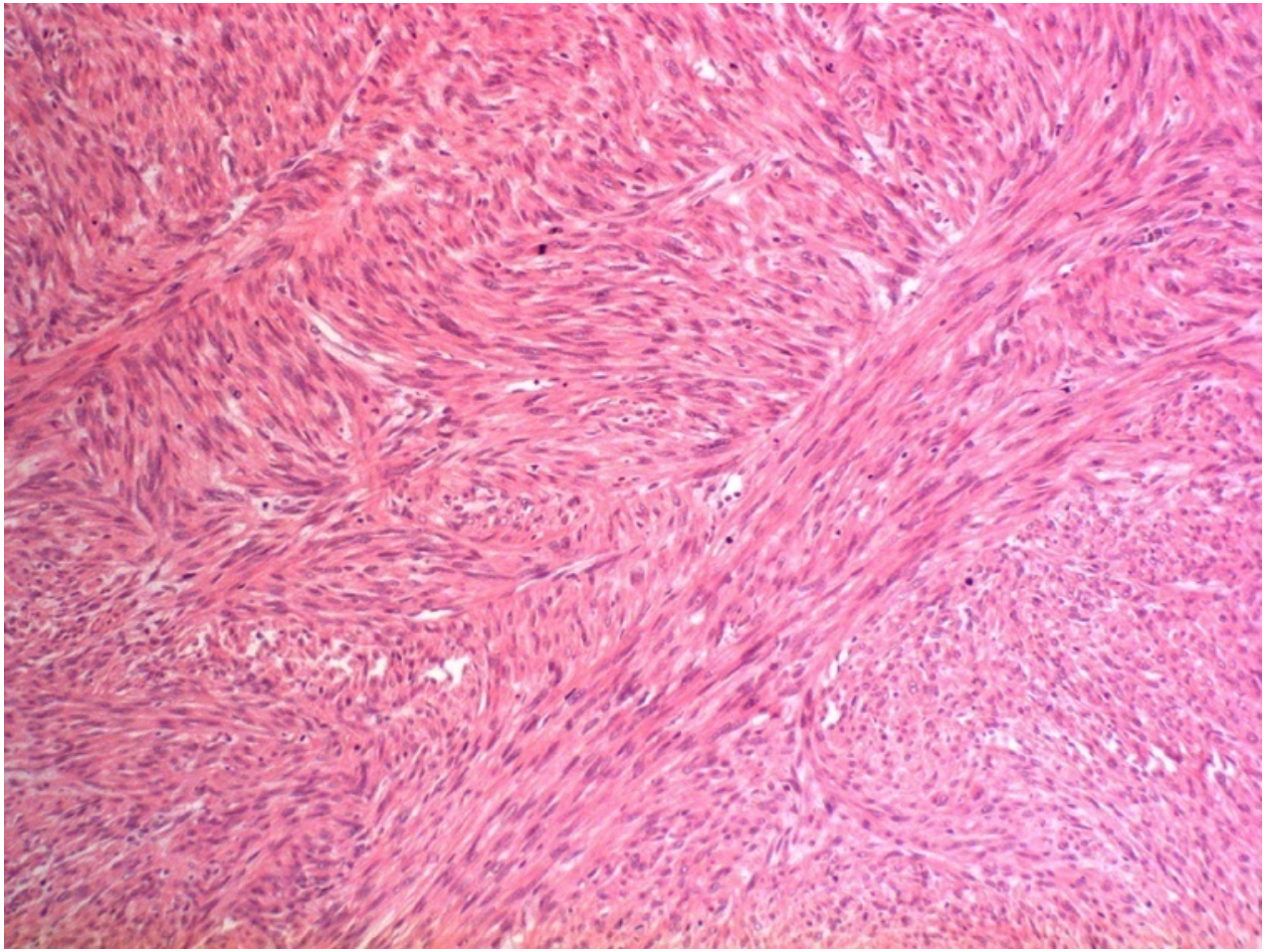

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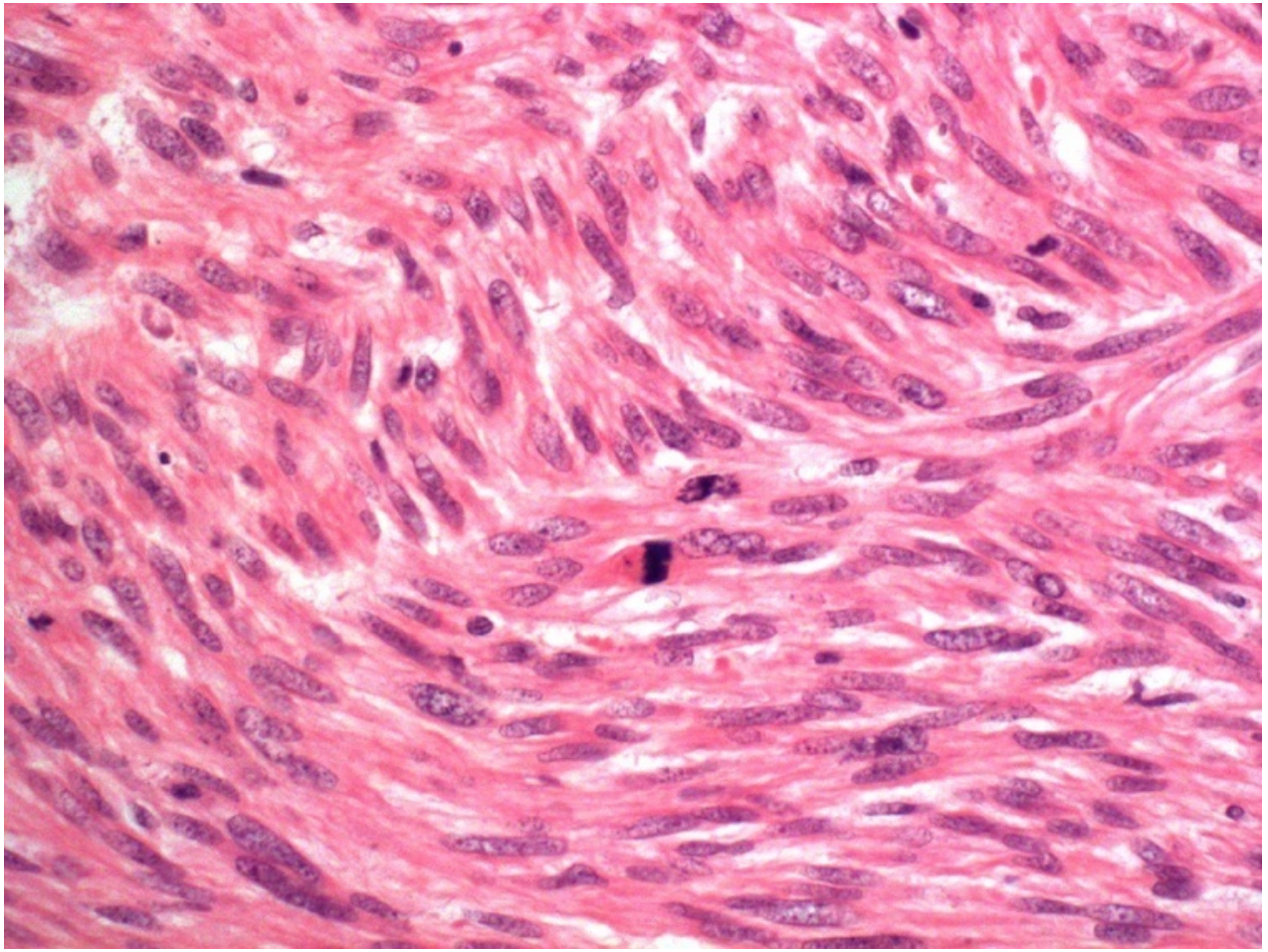


B13

Leiomyosarcoma

- Rare, commonest adult primary bladder sarcoma
- Wide age, usually >50yrs; Male >female
- Haematuria, irritative symptoms
- High recurrence/metastatic rate

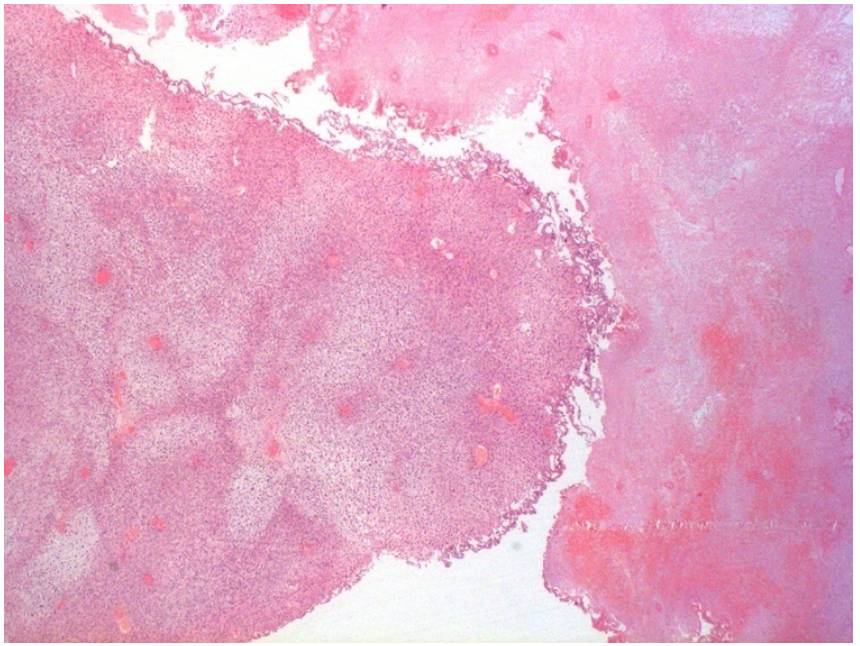
- Typical features of LMS - atypia, mitoses, necrosis
- IHC: ALK1- p63- HMWCK- SMA+ Desmin+ H-caldesmon+

DD

- Sarcomatoid UC (HMWCK+ p63+, previous history of UC)
- Inflammatory/pseudosarcomatous myofibroblastic proliferation

B11

- Female 86yrs
- New bladder tumour



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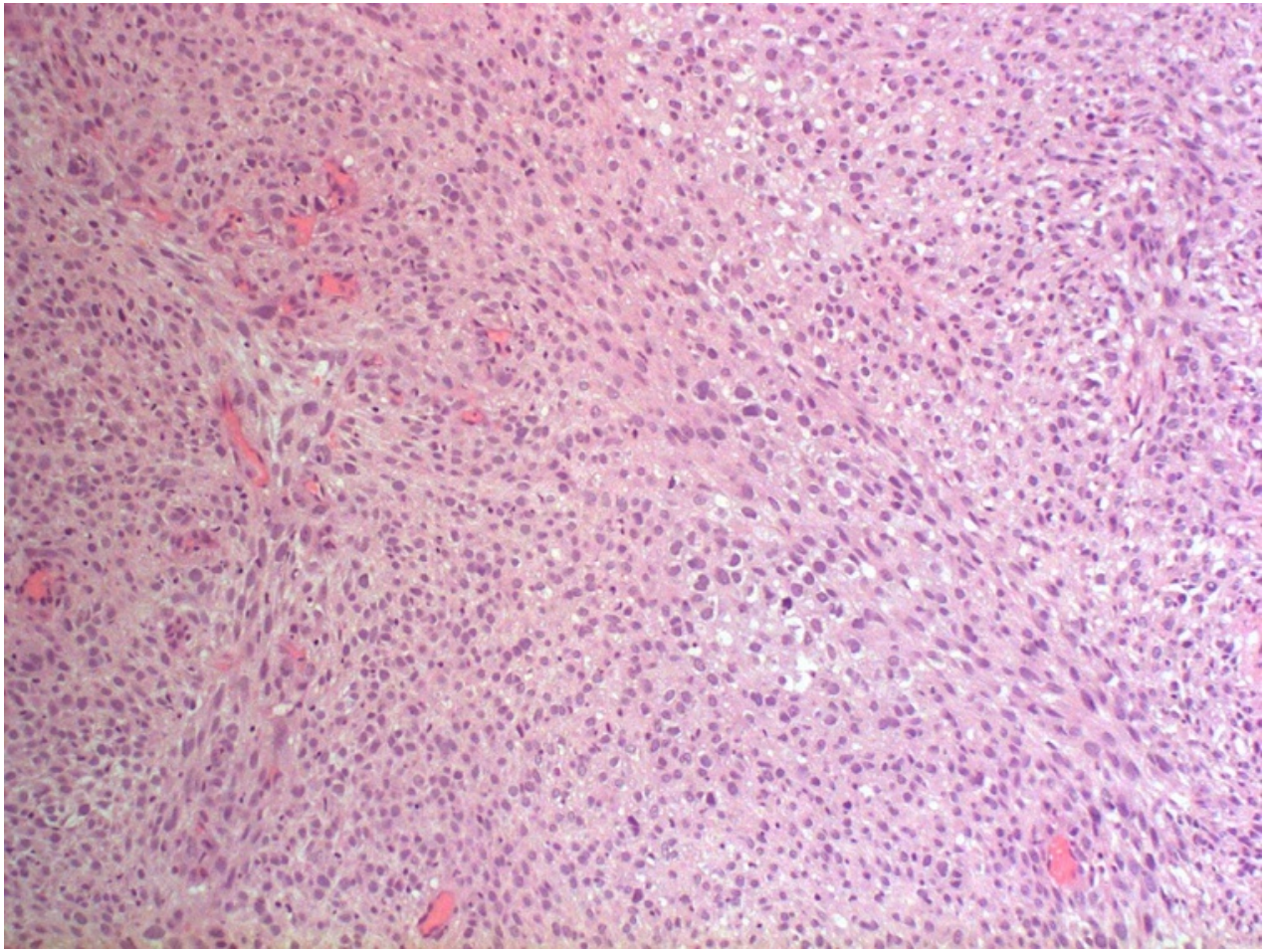

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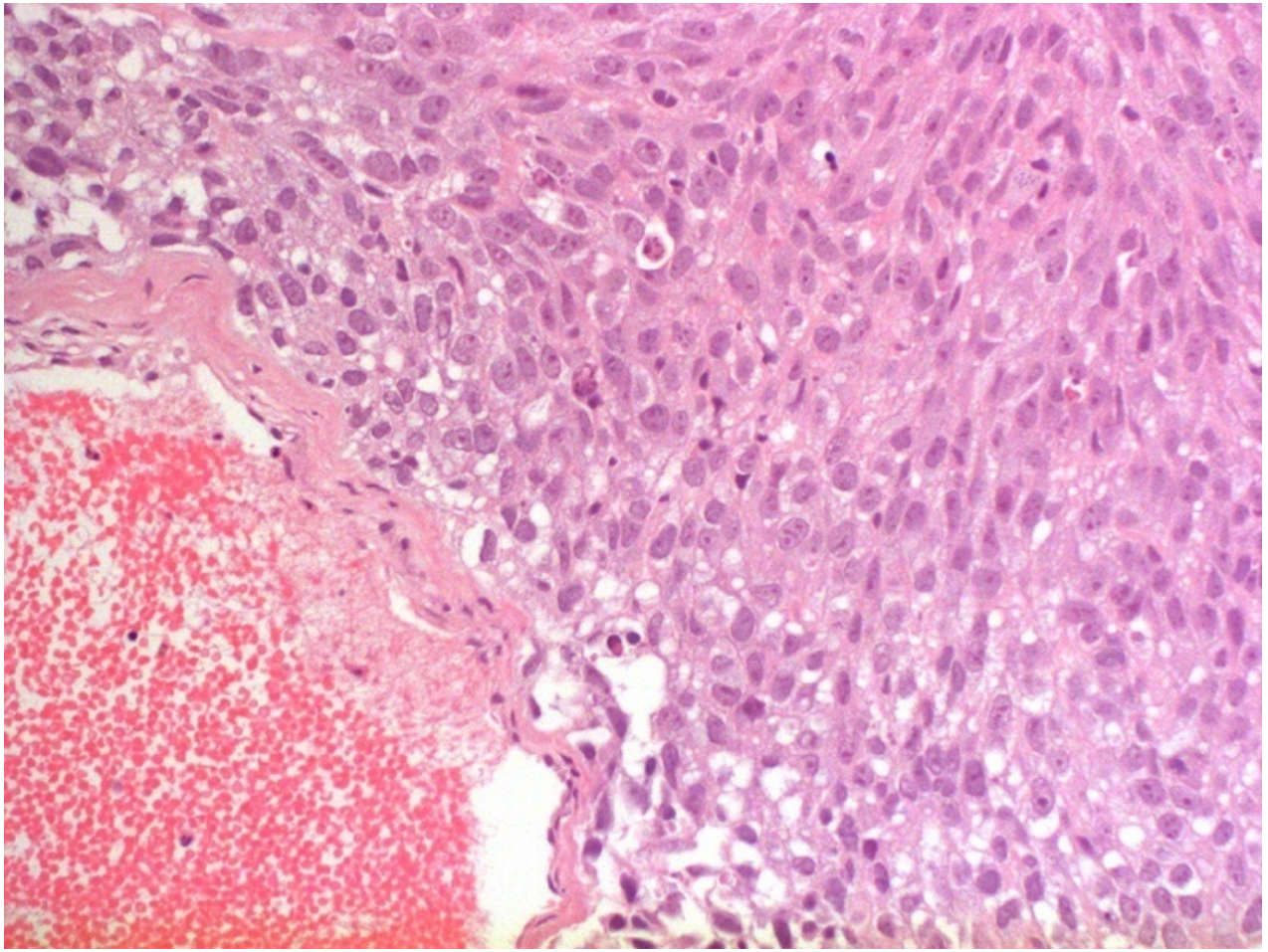

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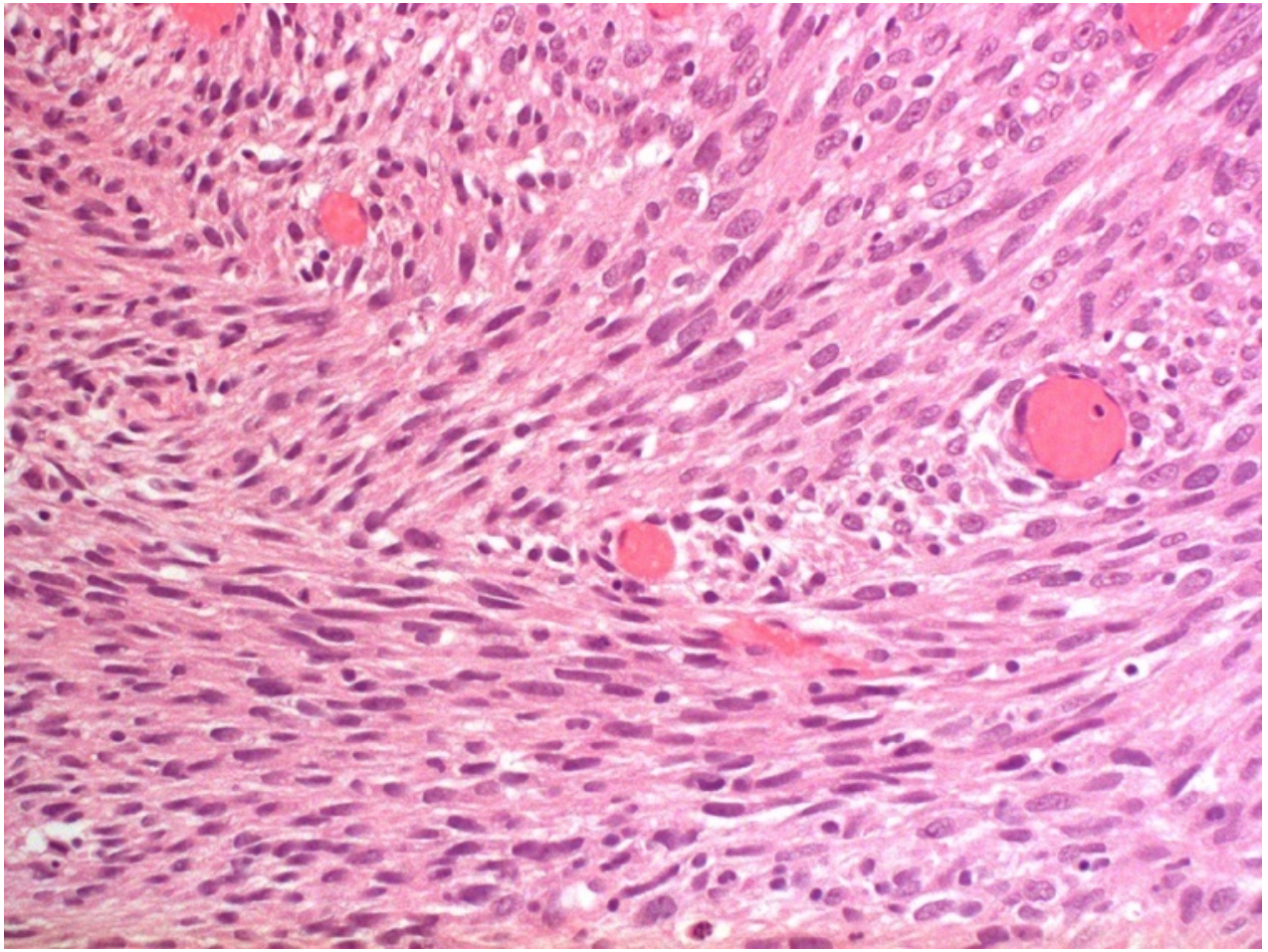

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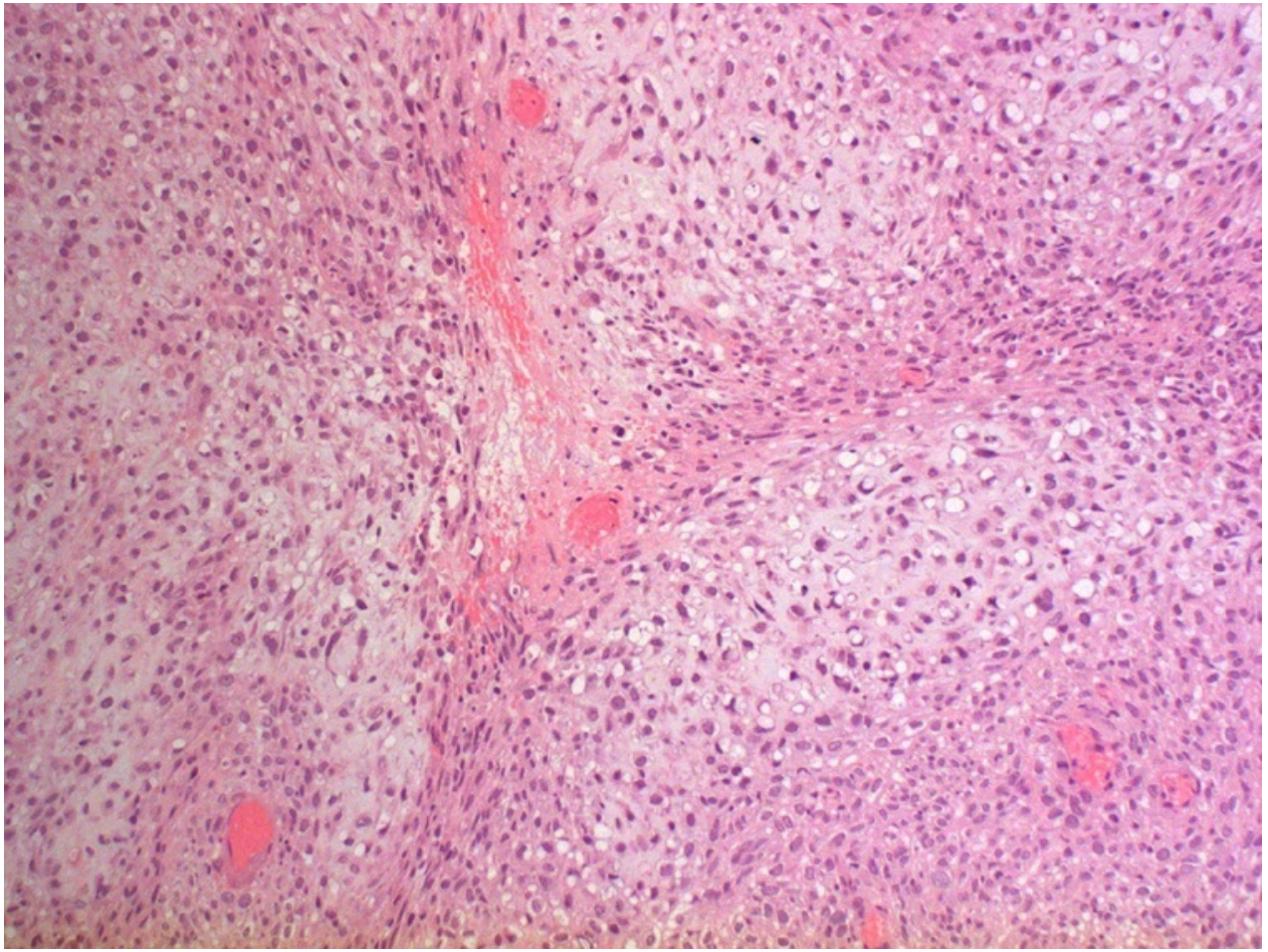

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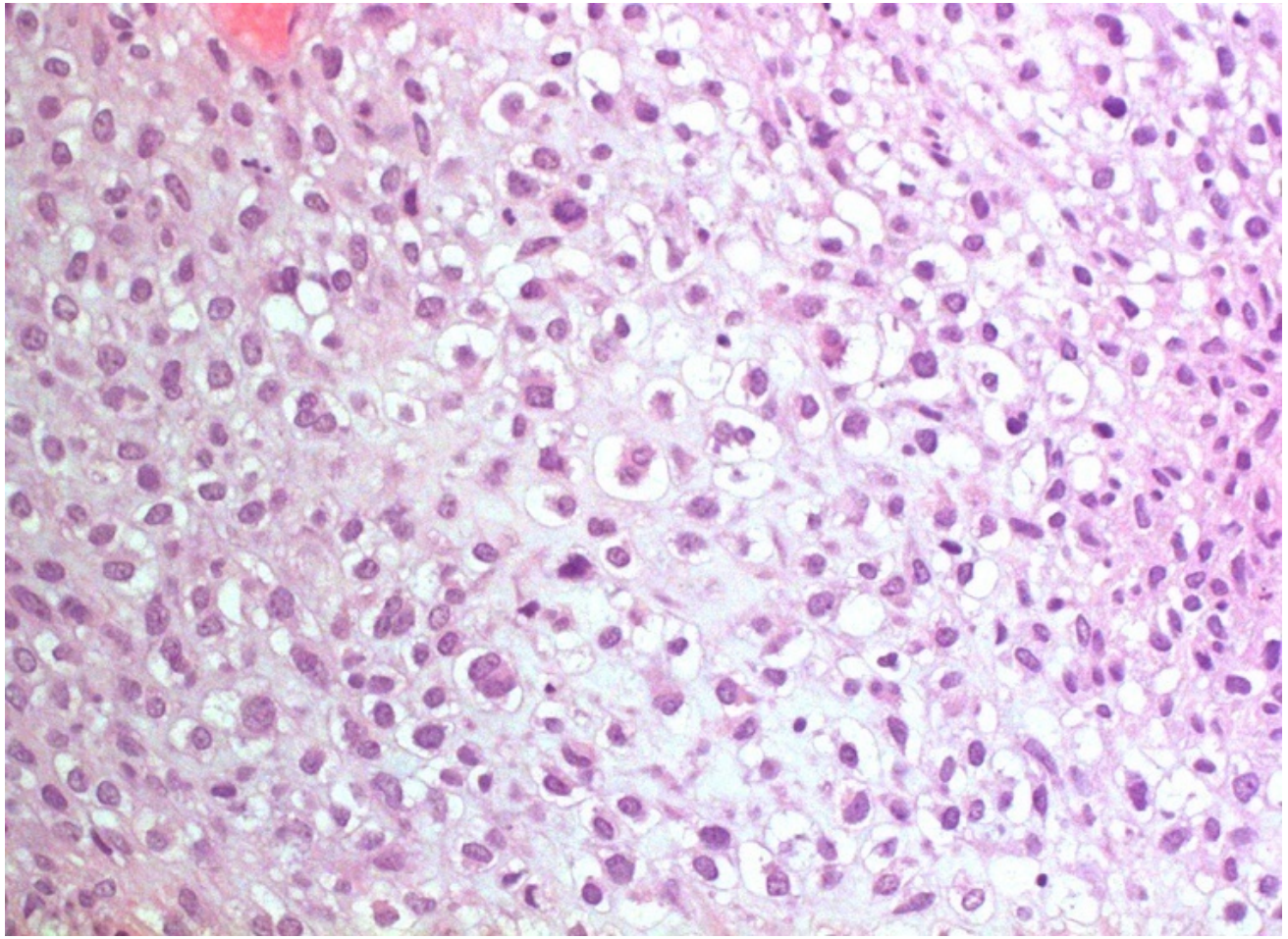


B11

Sarcomatoid urothelial carcinoma with heterologous elements

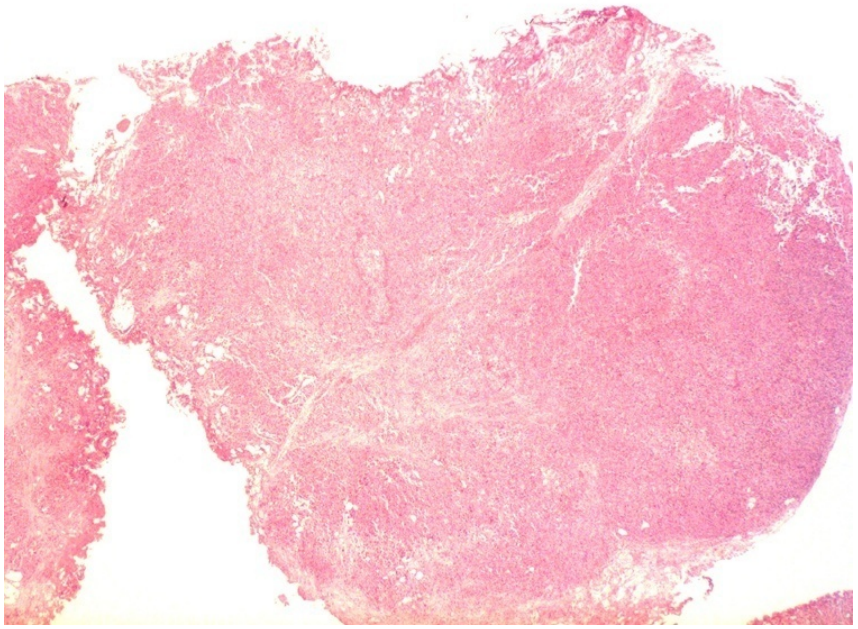
- Mean age 66yrs; haematuria; aggressive
- Associated carcinoma can be UC in-situ, invasive, SqCCa, adenocarcinoma
- Usually spindle cell sarcomatoid (HMWCK+ p63+)
- Heterologous elements – osteosarcomoma, chondrosarcoma, rhabdomyosarcoma, leiomyosarcoma
- Look for associated carcinomatous element

DD

- Inflammatory/pseudosarcomatous myofibroblastic proliferation
- Leiomyosarcoma

B12

- Male 66yrs
- Bladder wall thickening on CT



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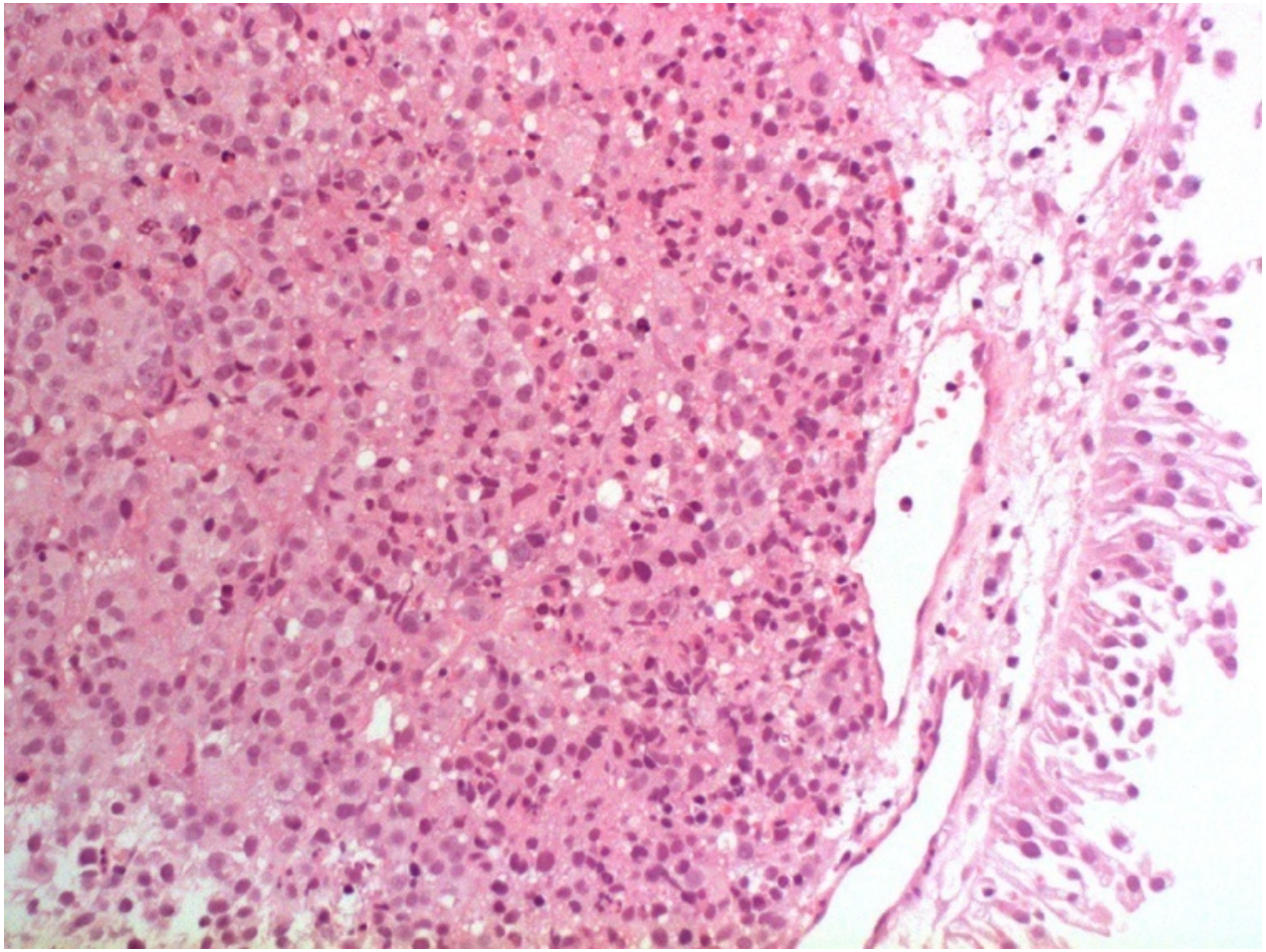

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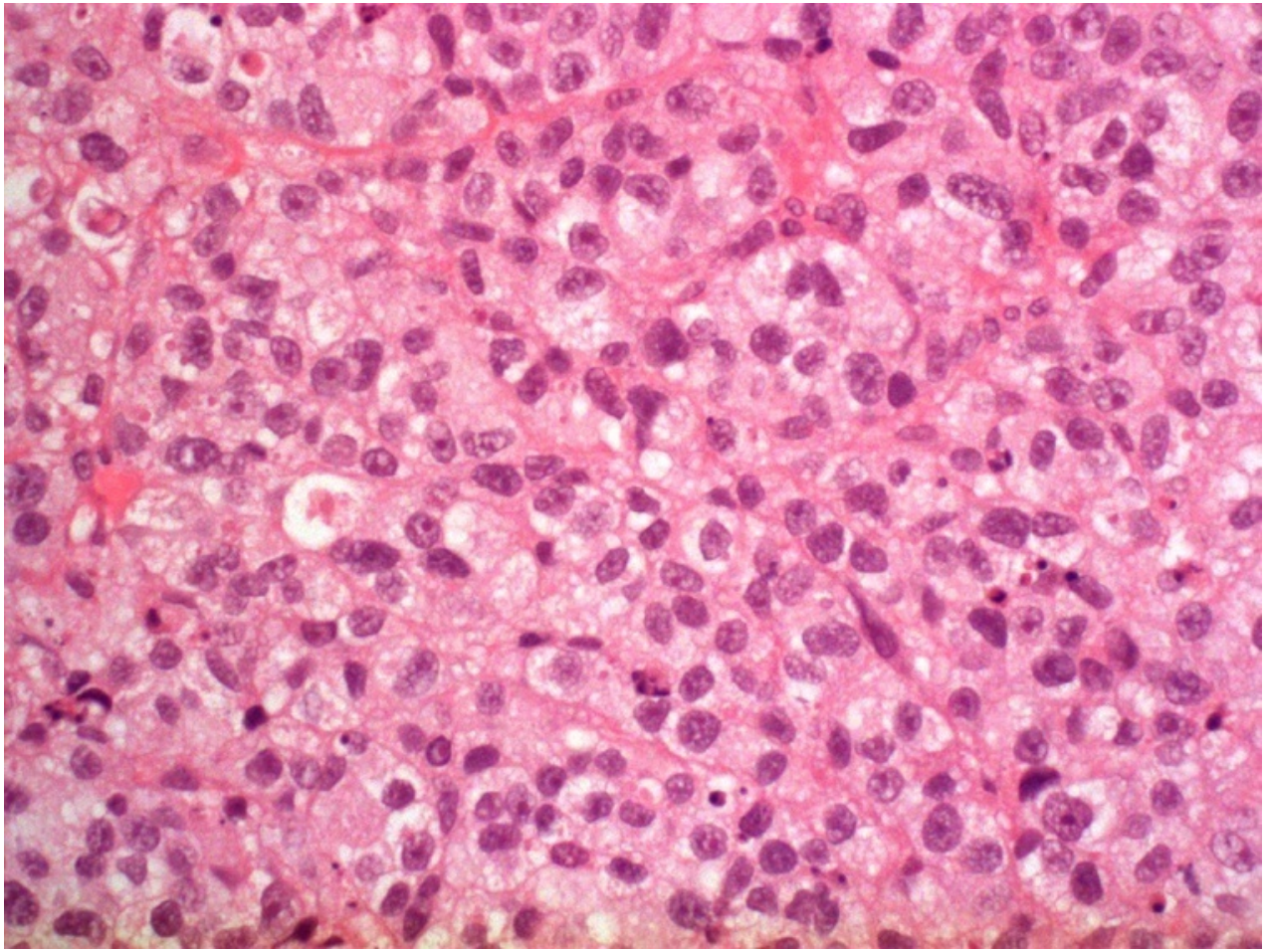

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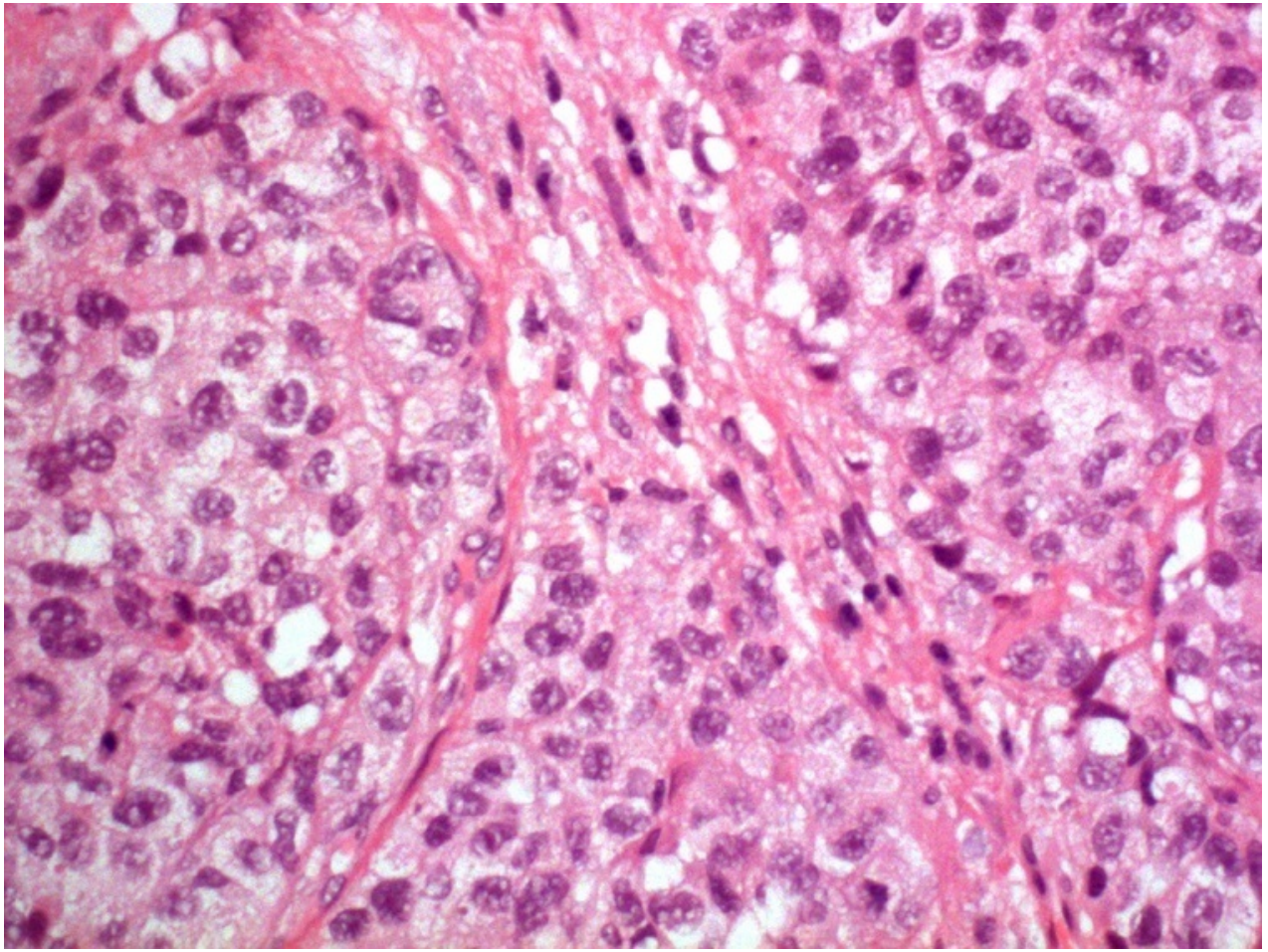


B12

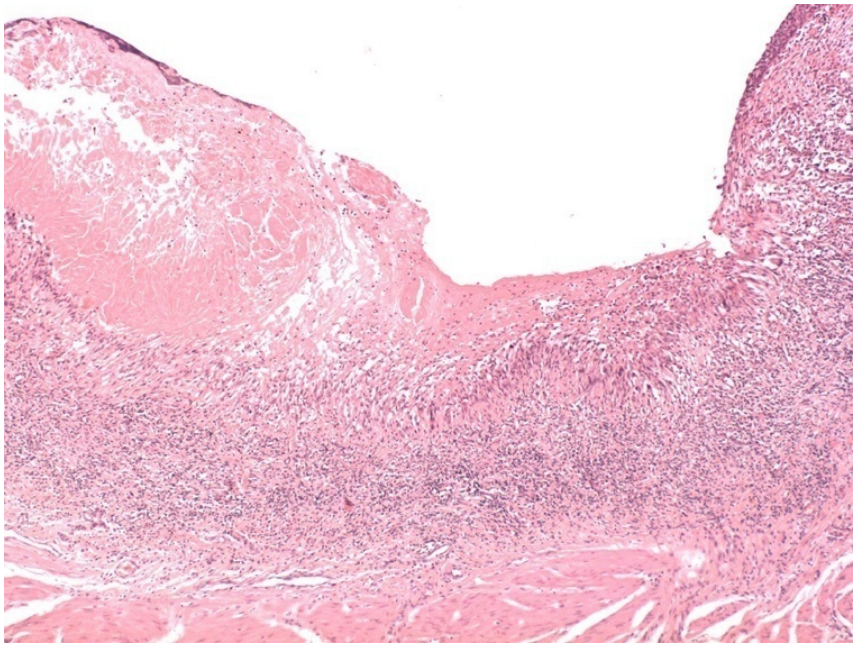
Metastatic malignant melanoma

- Rare
- Features as for other metastatic lesions
- IHC: HMB45+ Mel-A+ S100+ CD45- PSA- CK-
- Need clinical history

- Other bladder secondaries:
  - Colon and rectum
  - Breast
  - Prostate (especially bladder neck specimens)
  - Cervix
  - Ovary

B19

- Male 77yrs
- Cystoprostatectomy for BCG resistant G3 pT1 UC



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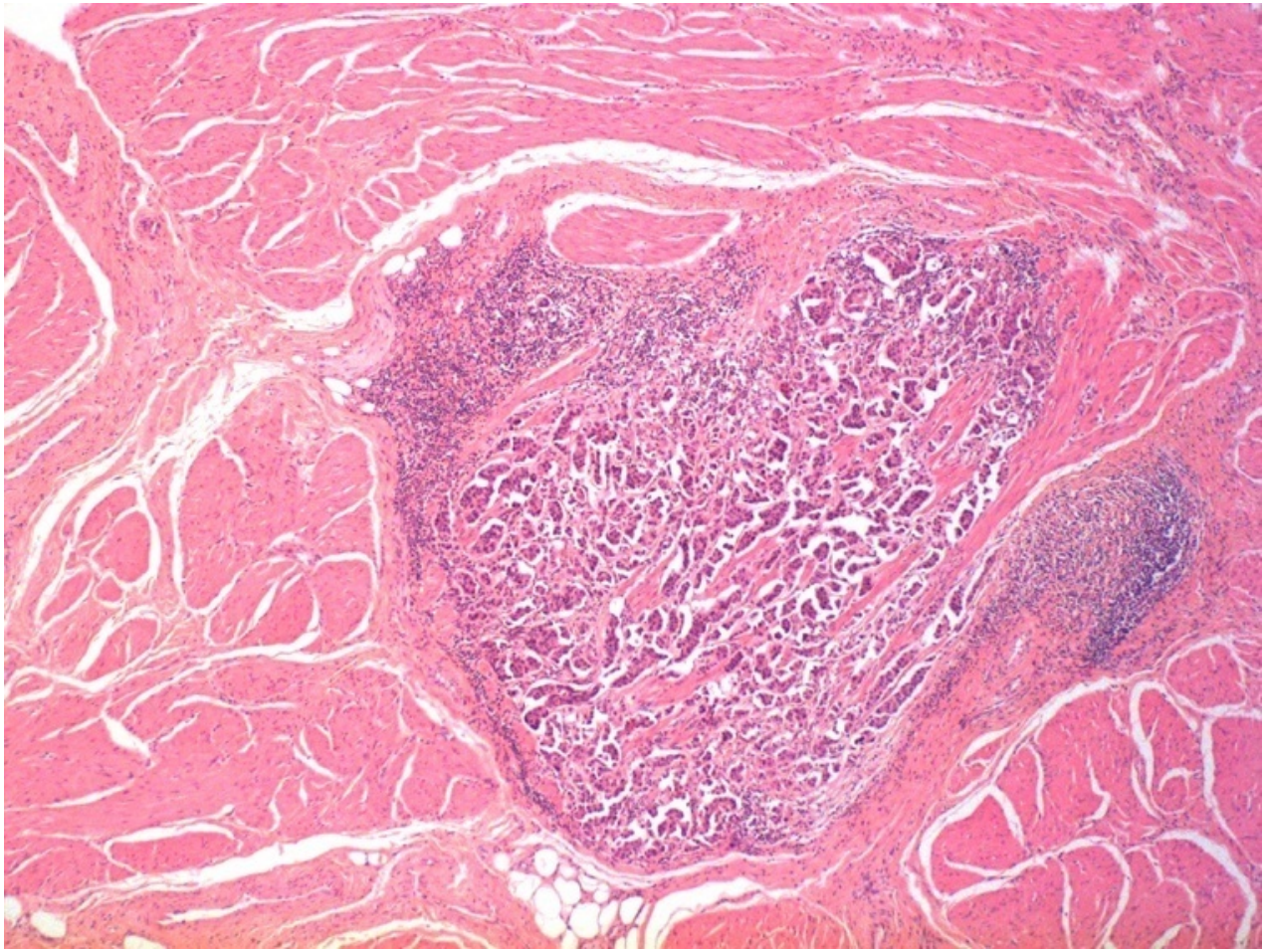

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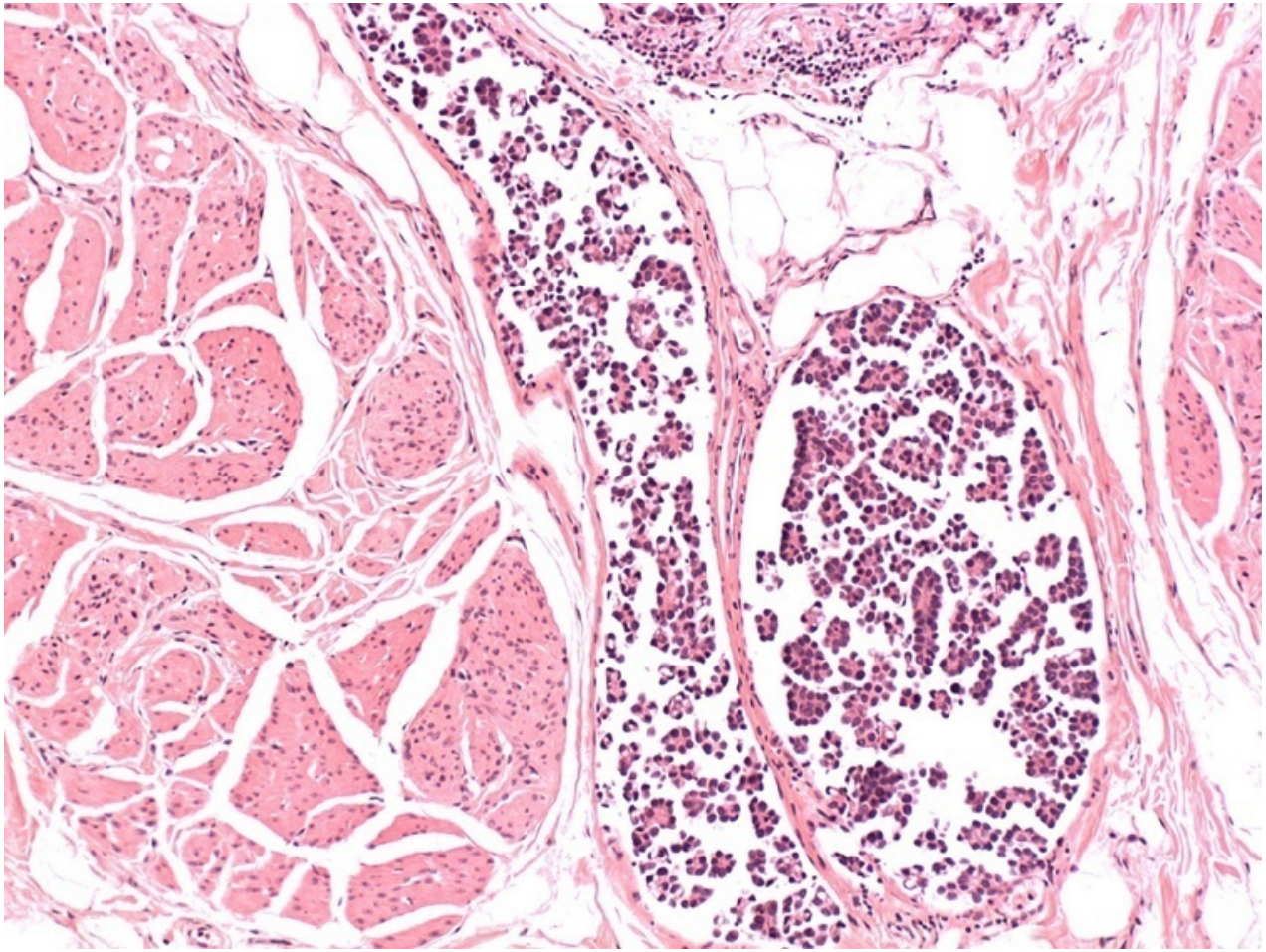

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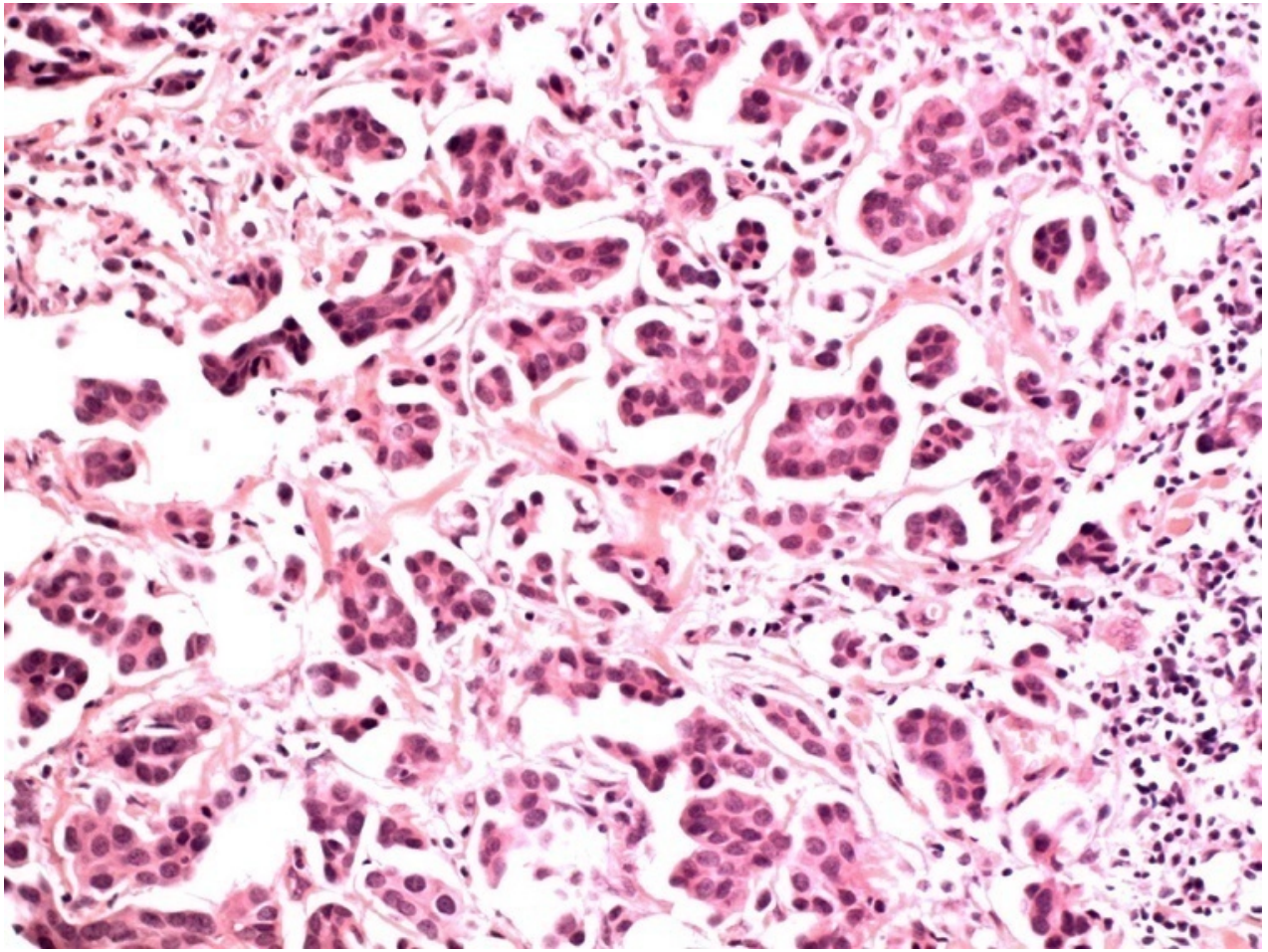


B19

Urothelial carcinoma – micropapillary variant

- Male > female; mean age 66yrs

- Retraction spaces prominent with single/multiple nests
- Low or high grade nuclei
- IHC: EMA/MUC1+ CK7+ CK20+ Ca125+/- HER2+/-
- In-situ form is villiform and slender (still call CIS)
- Aggressive - frequently muscle invasive and show lymphovascular invasion at time of diagnosis

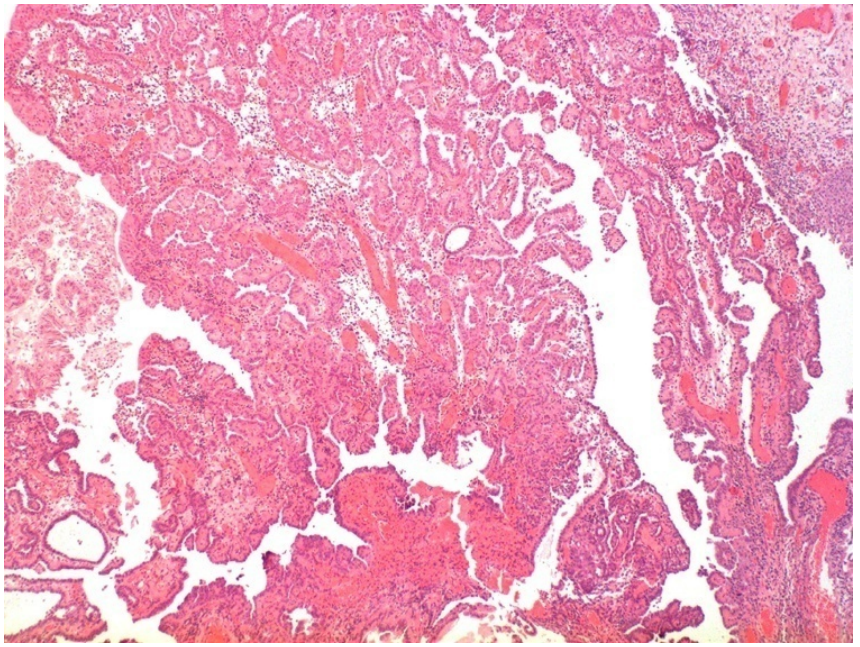
DD

- Ovarian serous carcinoma (ER+ WT1+ Pax-8+) in females
- Typical UC with retraction artefact (larger nests)

B17

- Female 20yrs
- Germ cell tumour of ovary – oophorectomy, RPLND, chemo.

- Papillary lesions in bladder and carpet UC



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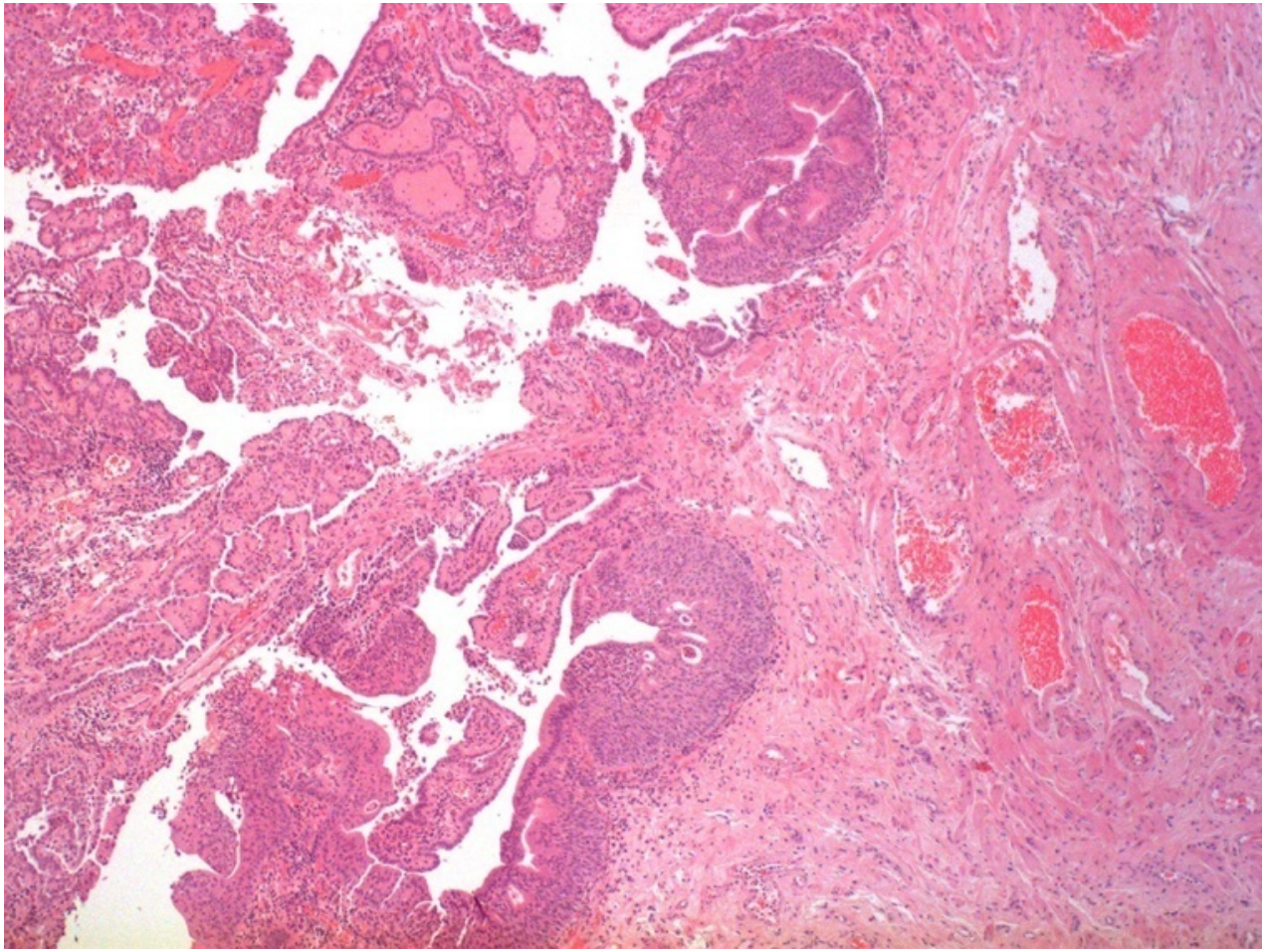
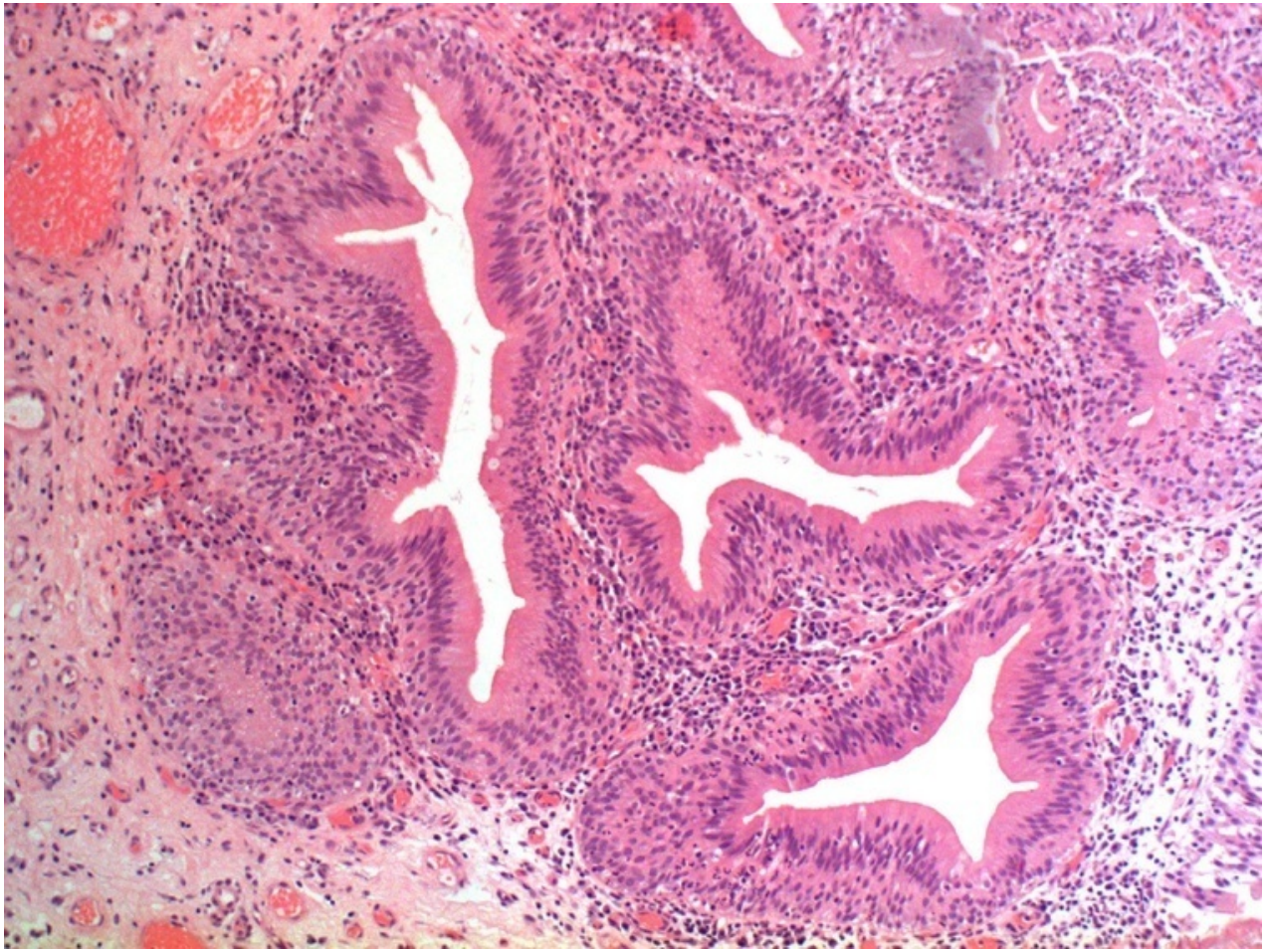


B17



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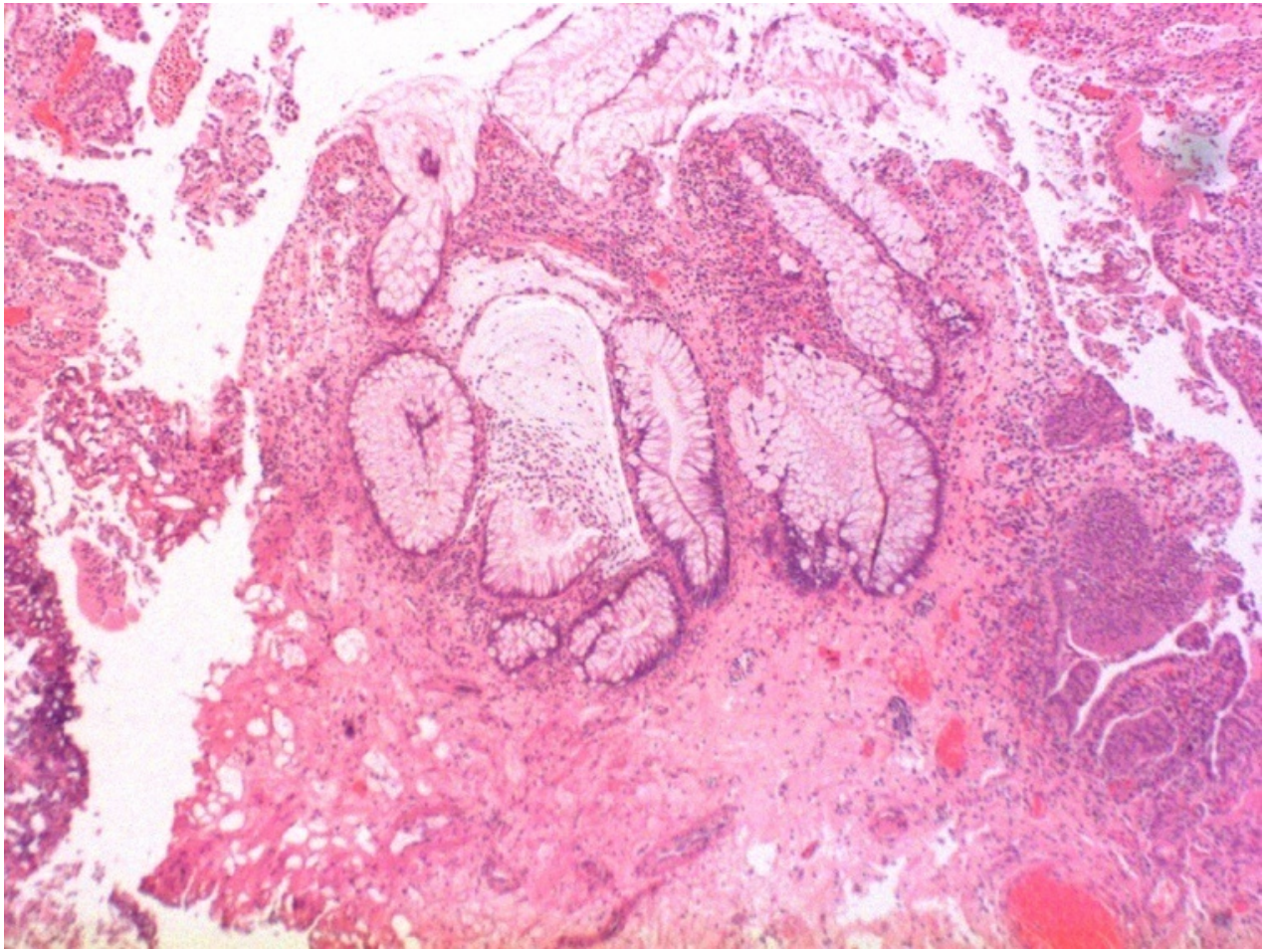

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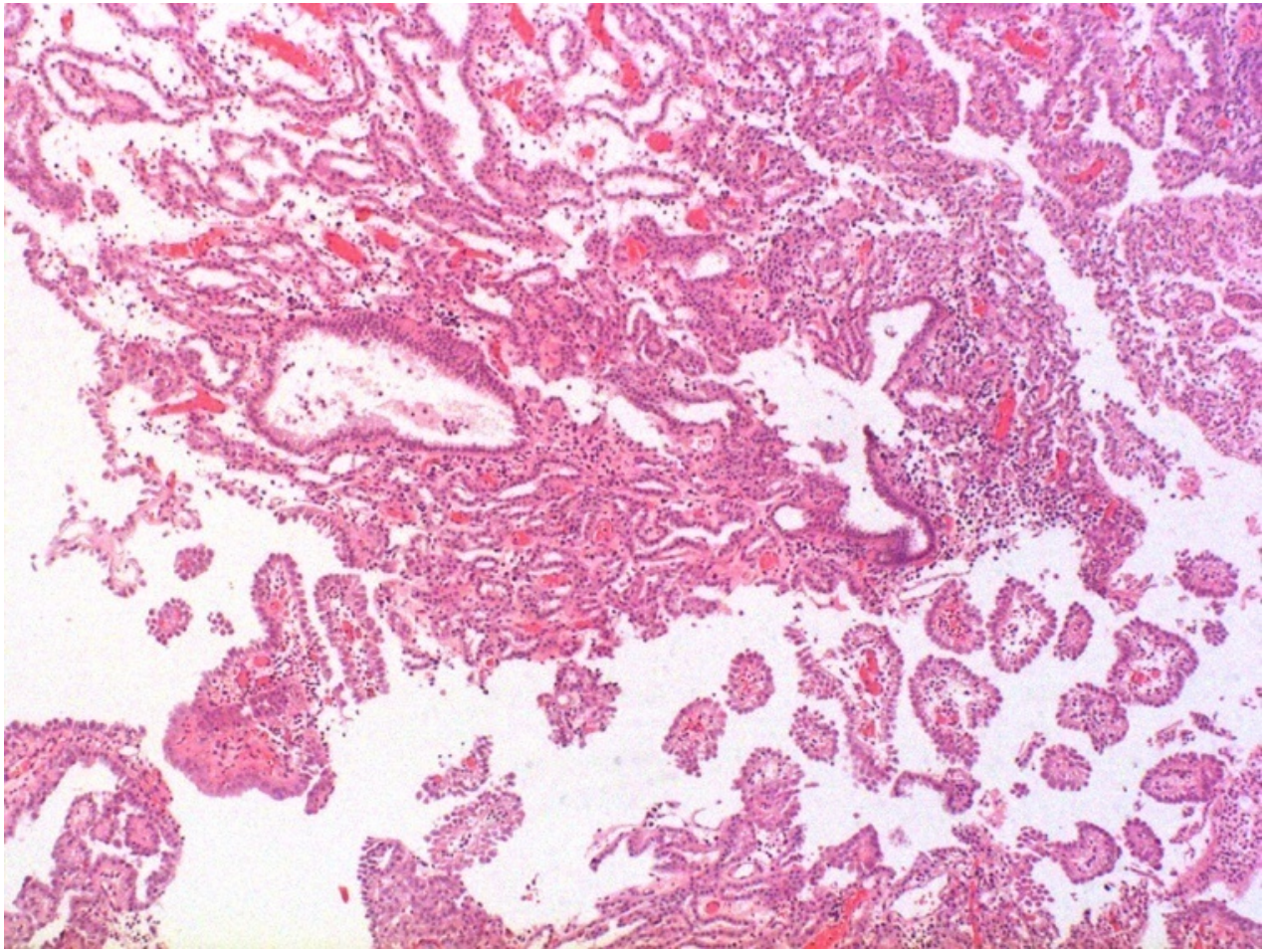
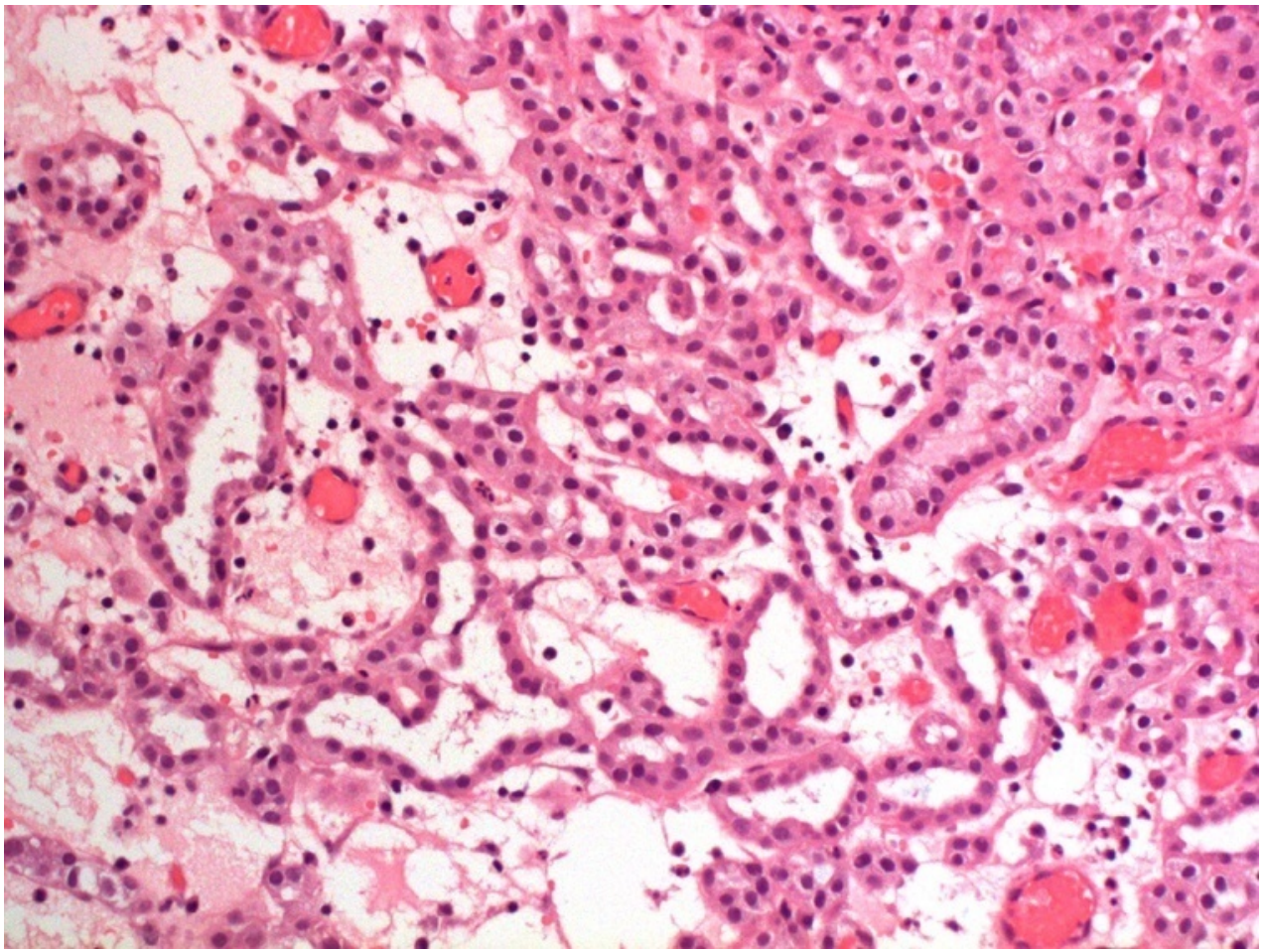
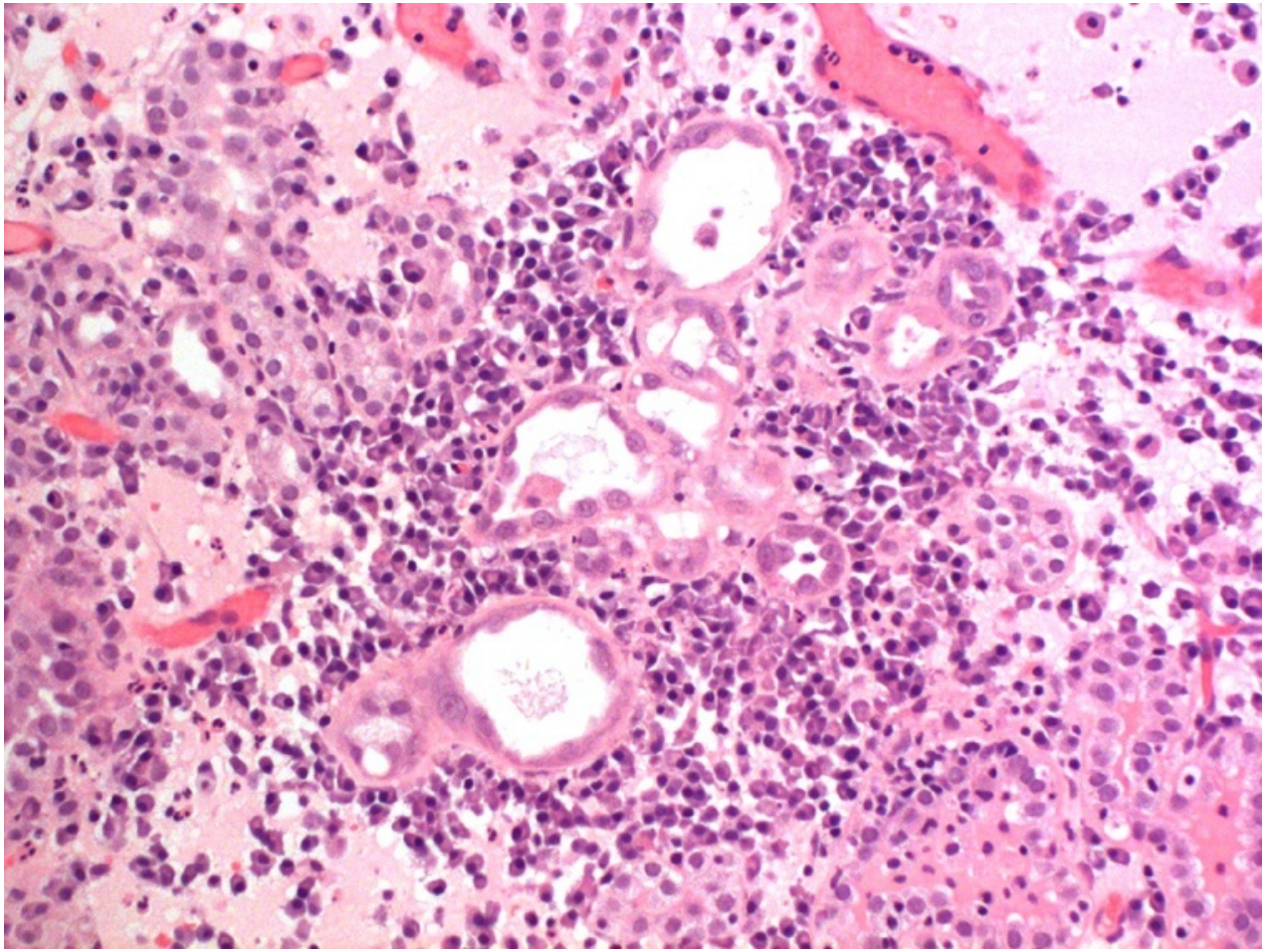
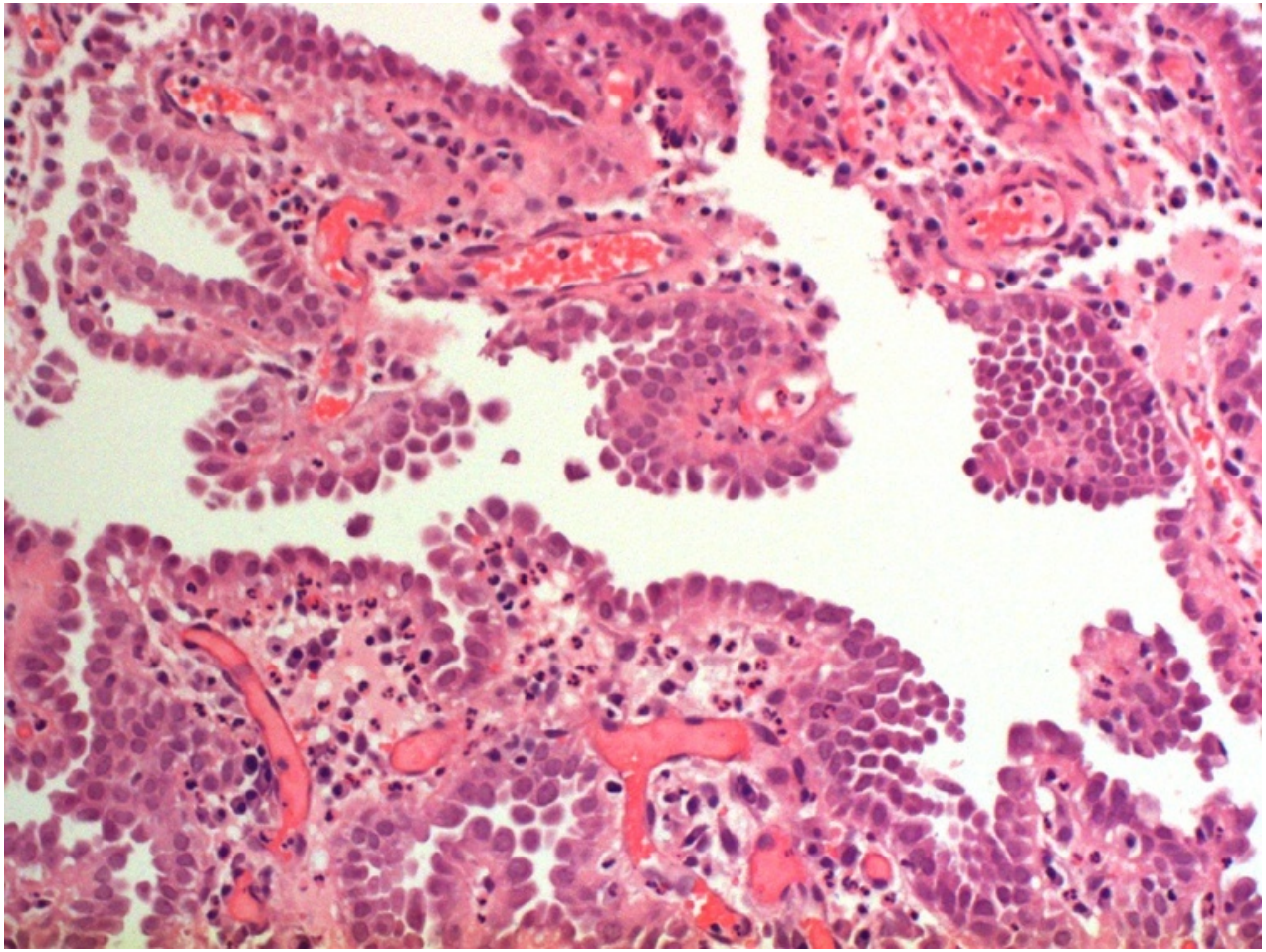








B17

Nephrogenic metaplasia/adenoma with cystitis cystica/ glandularis and intestinal metaplasia

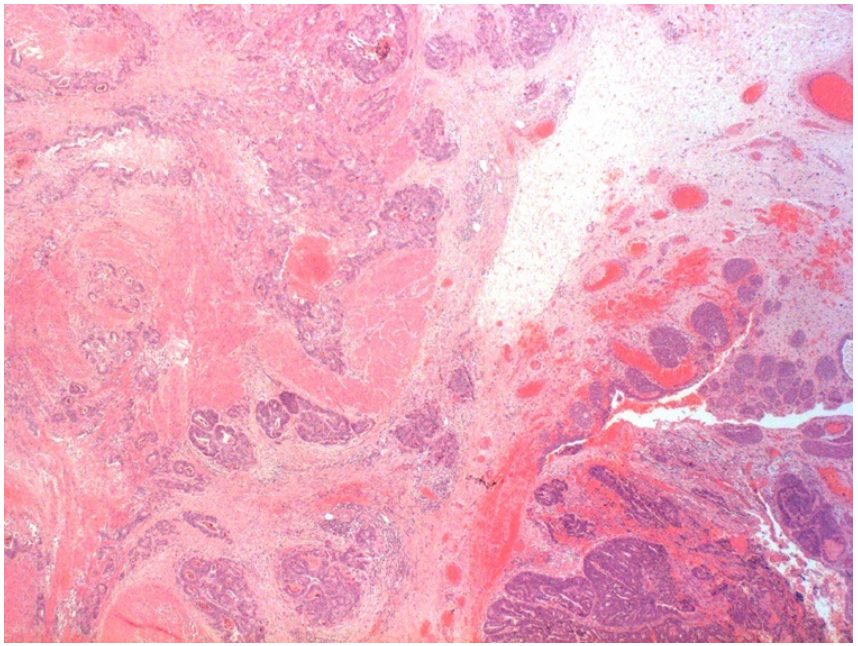
- Secondary to injury – infection, calculi, surgery, BCG, instrumentation; bladder & urethra esp; haematuria
- Polypoid-papillary or flat and velvety
- Tubular/glandular/papillary with cuboidal/hobnail/signet ring cells
- Thick tubular basement membranes
- IHC: CK7+ pax-2+ pax-8+ PSA+/- PSAP +/- AMACR +/-
- Benign, can recur

DD

- Clear cell adenocarcinoma
- Prostatic adenocarcinoma
- UC with glandular differentiation/nested/tubular

B20

- Male 70yrs
- Tumour bladder dome



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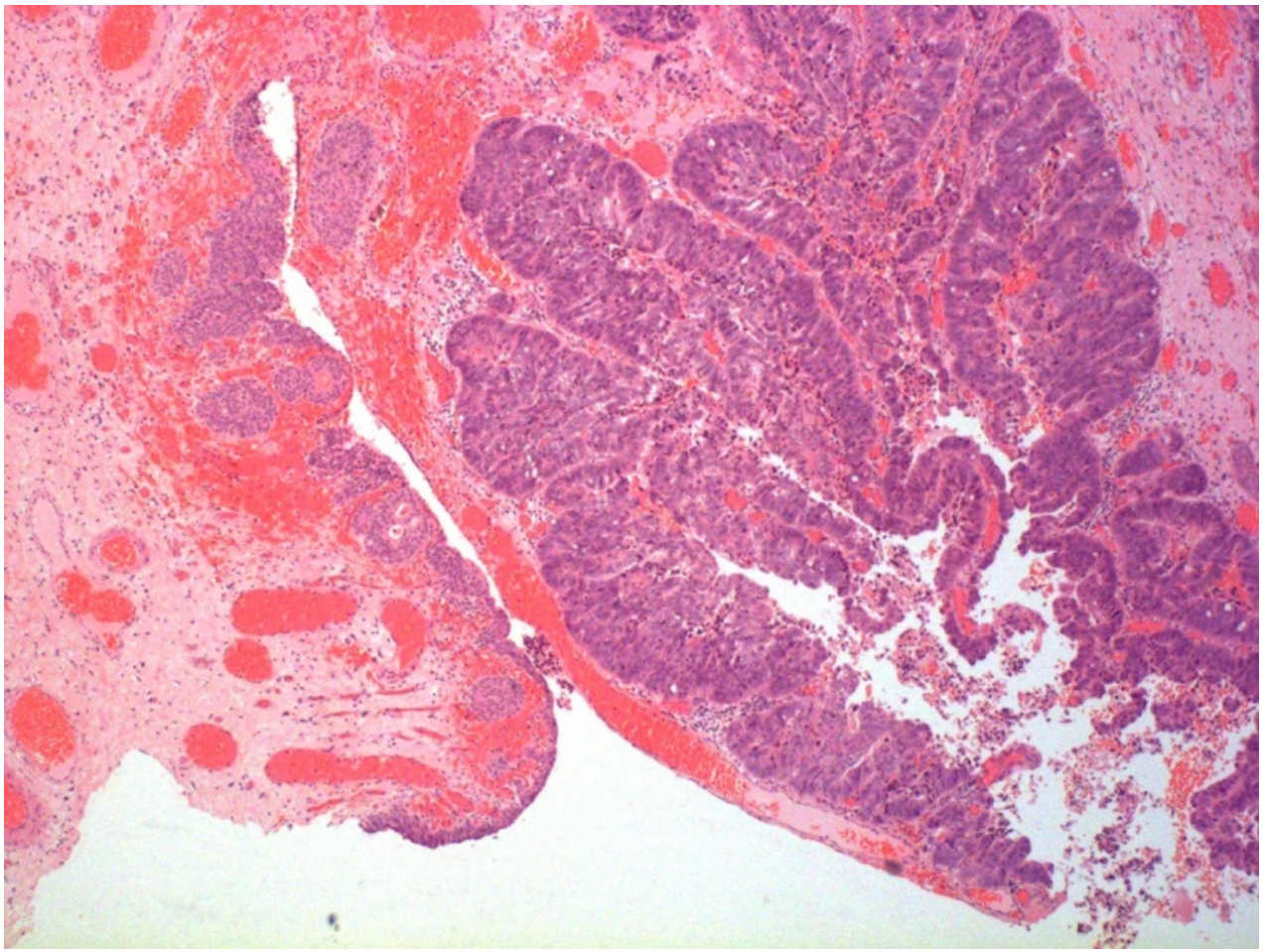

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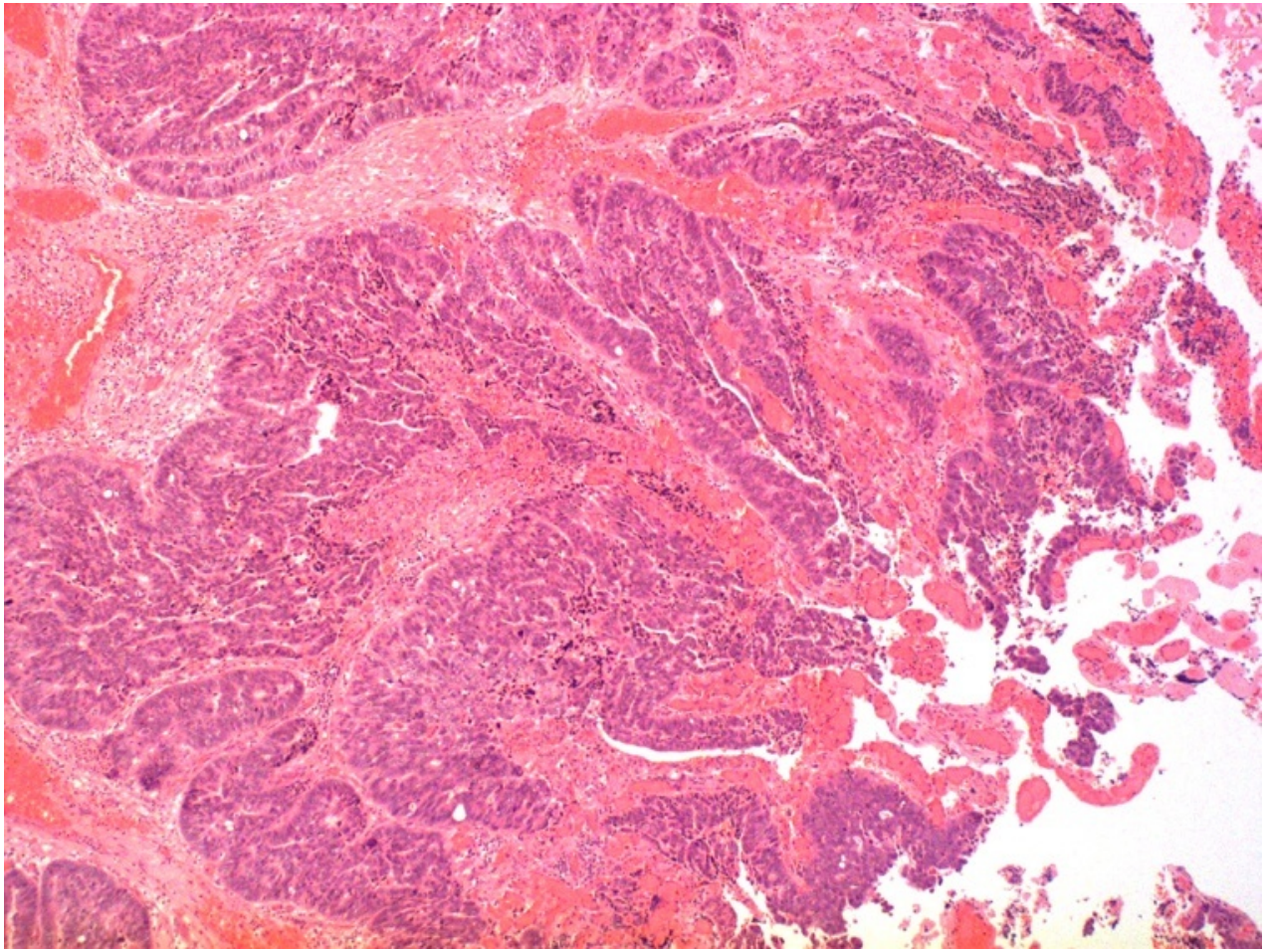

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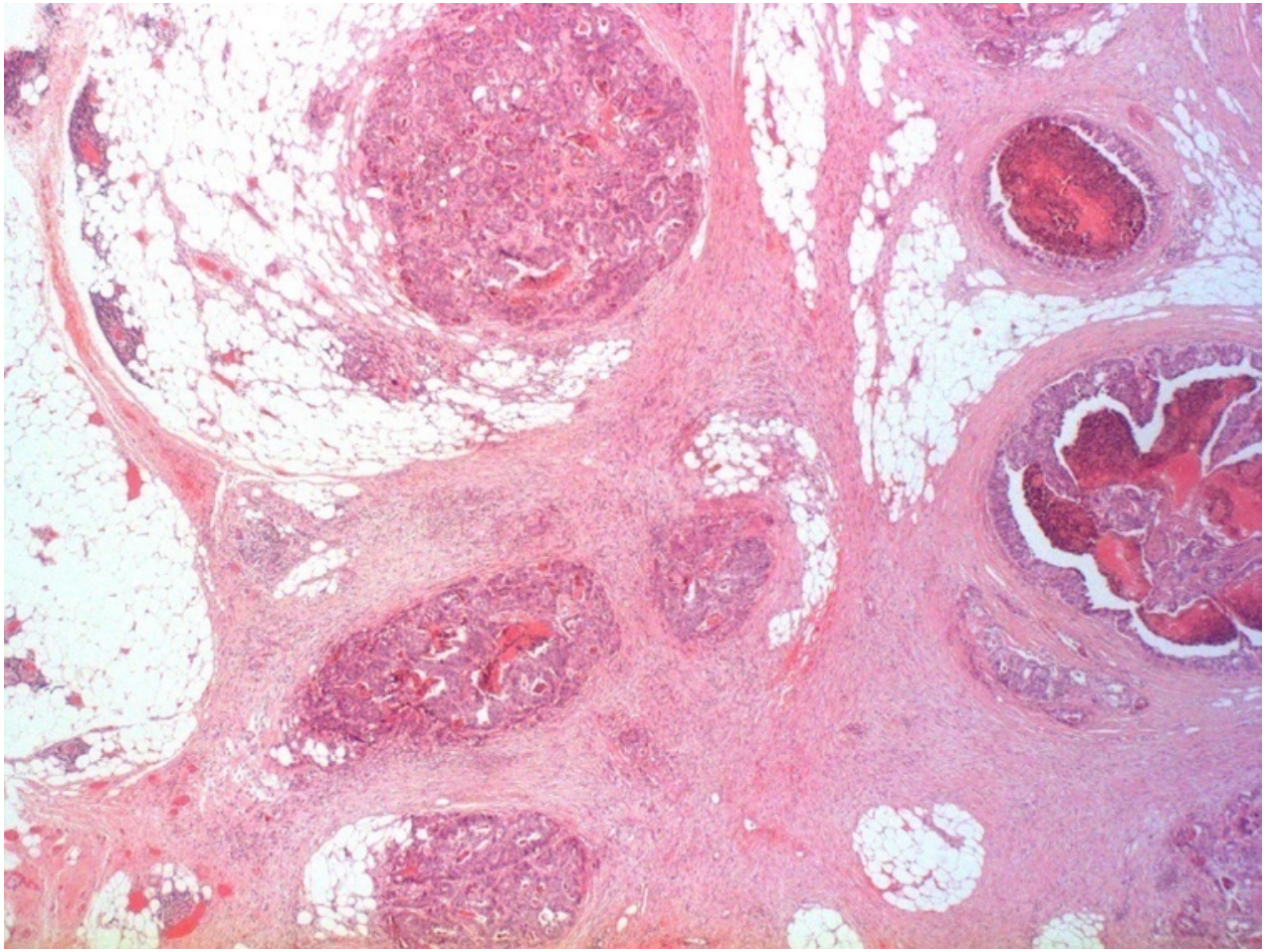

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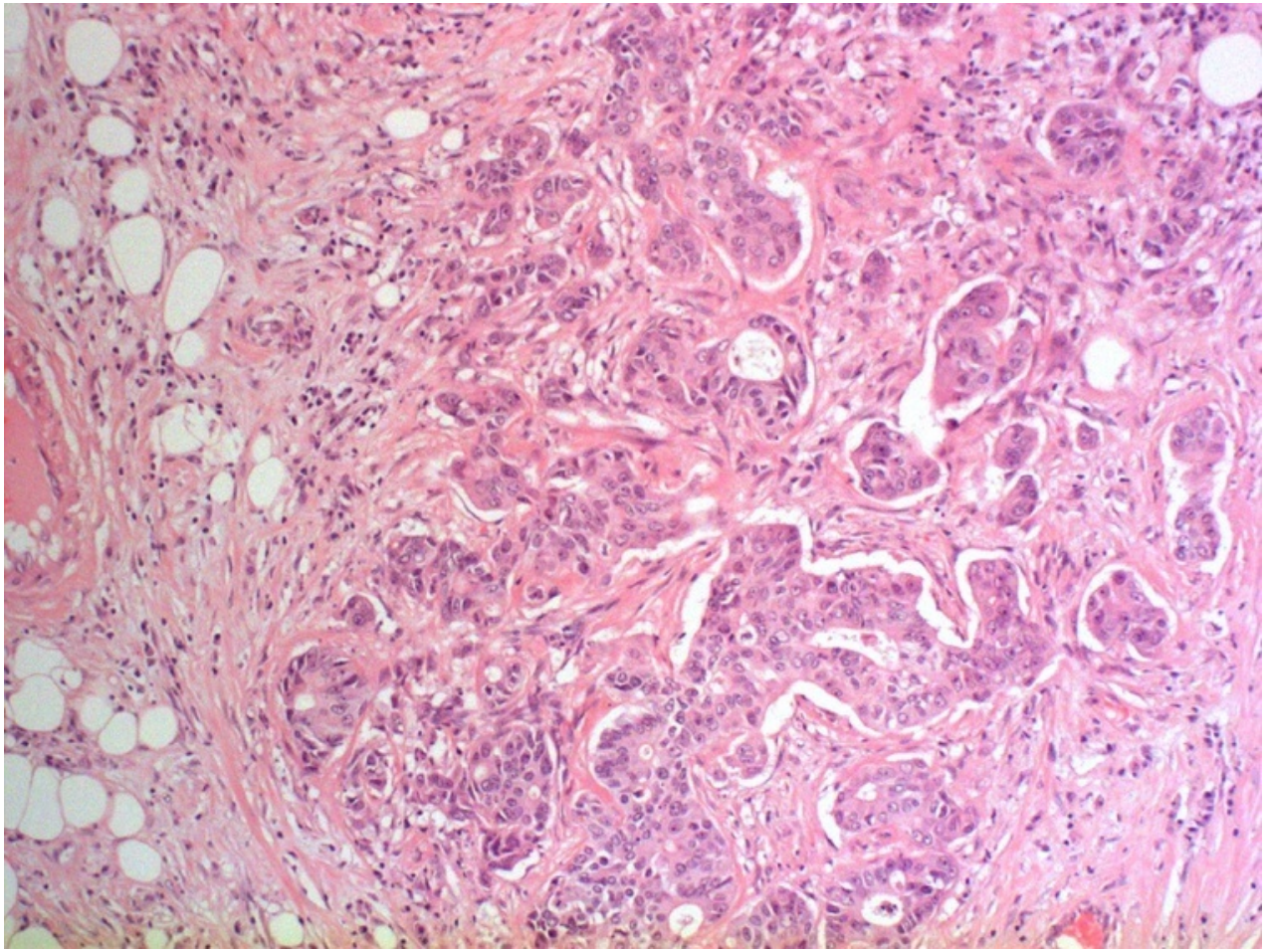


B20

Invasive rectal adenocarcinoma

- May look like a surface component present, mimicking primary
- Clinical history important (had a previous rectal carcinoma)
- Always consider local spread from colon or prostate if adenocarcinoma in bladder

DD

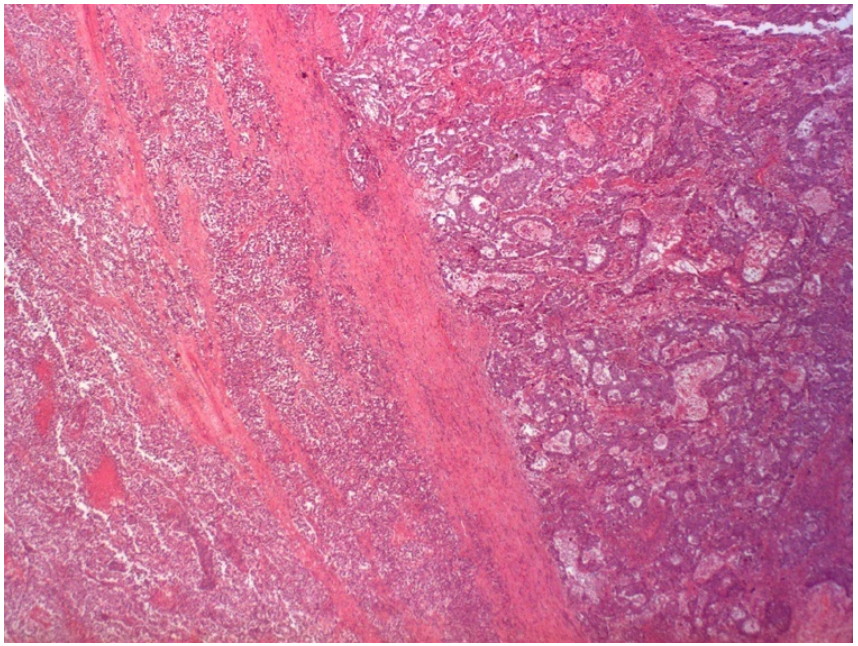
- Bladder primary adenocarcinoma – distinction difficult on IHC (Beta-catenin nuclear in colonic carcinoma)
- Urachal adenocarcinoma – dome/anterior wall

Testis

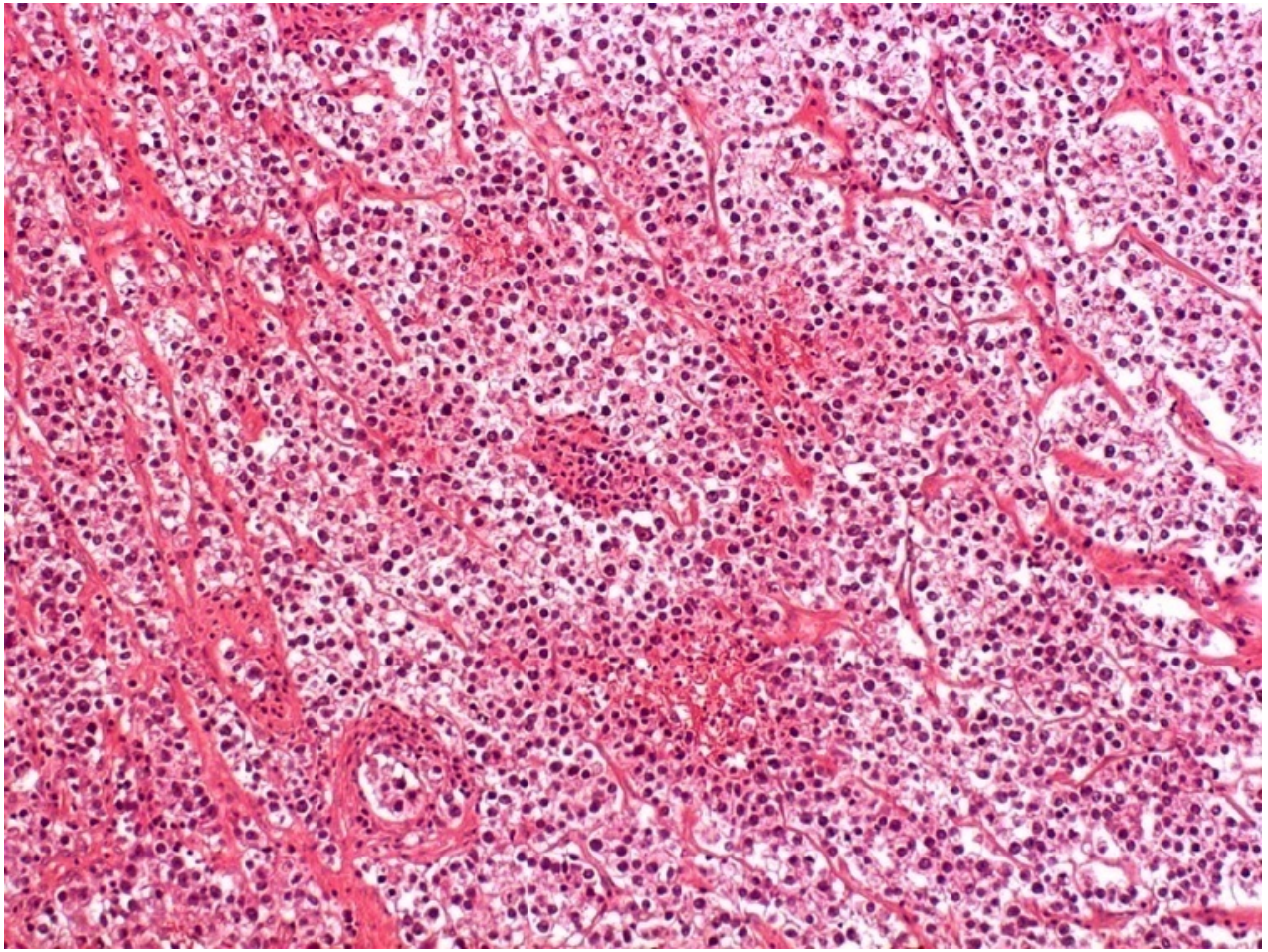
T1

- Male 37yrs

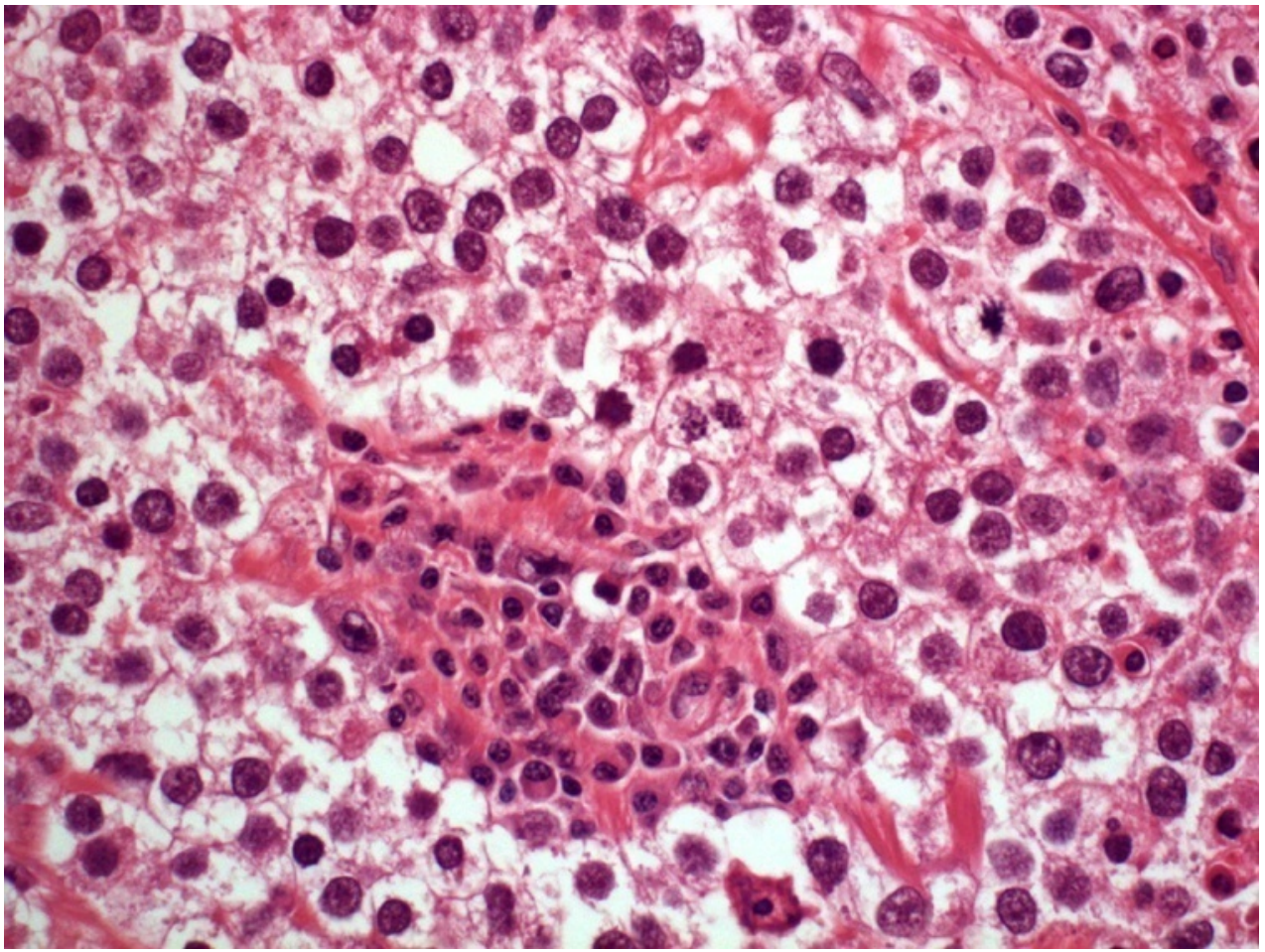
- Left testis mass, 55mms
- AFP 952
- HCG 58



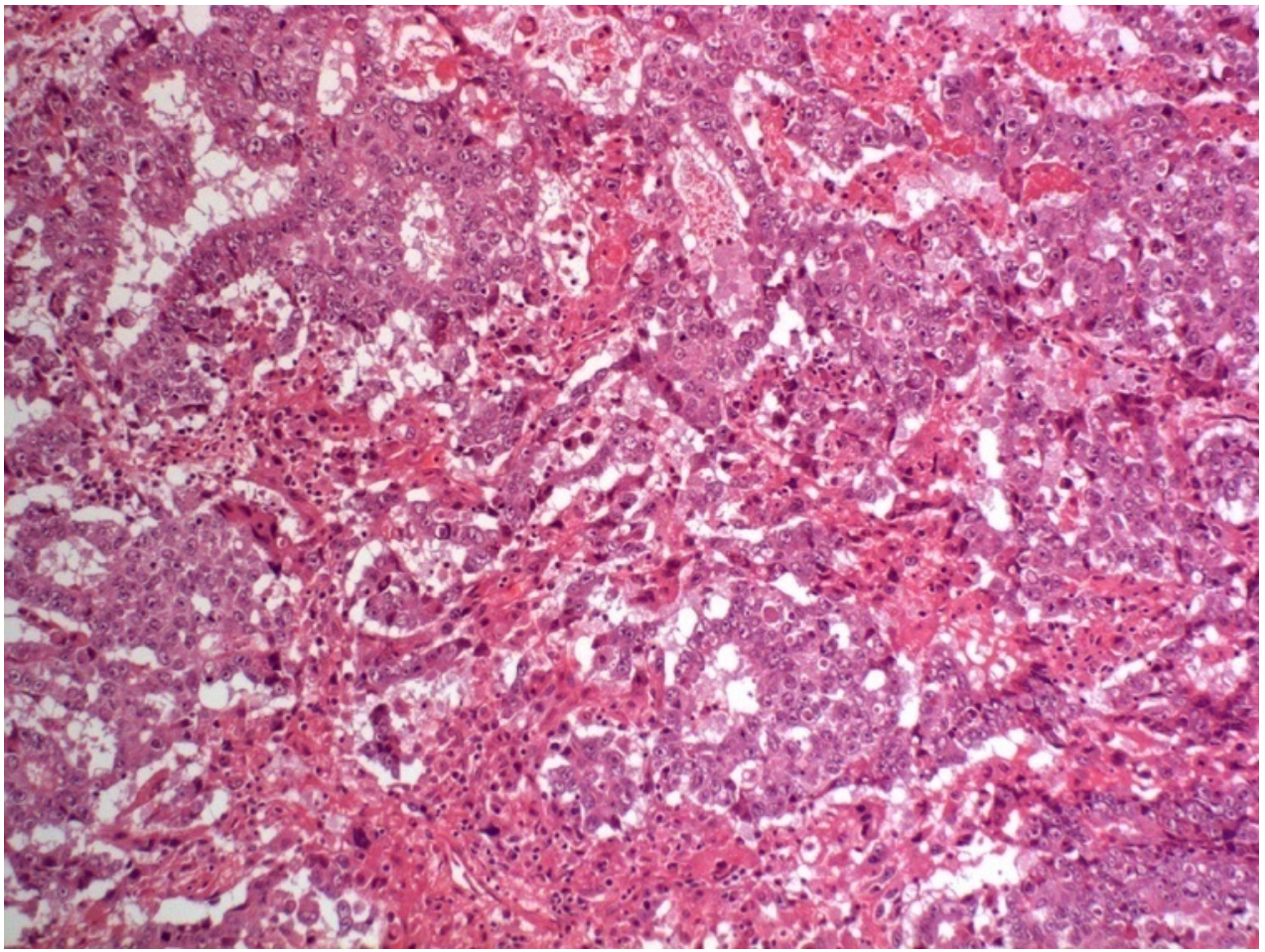
T1



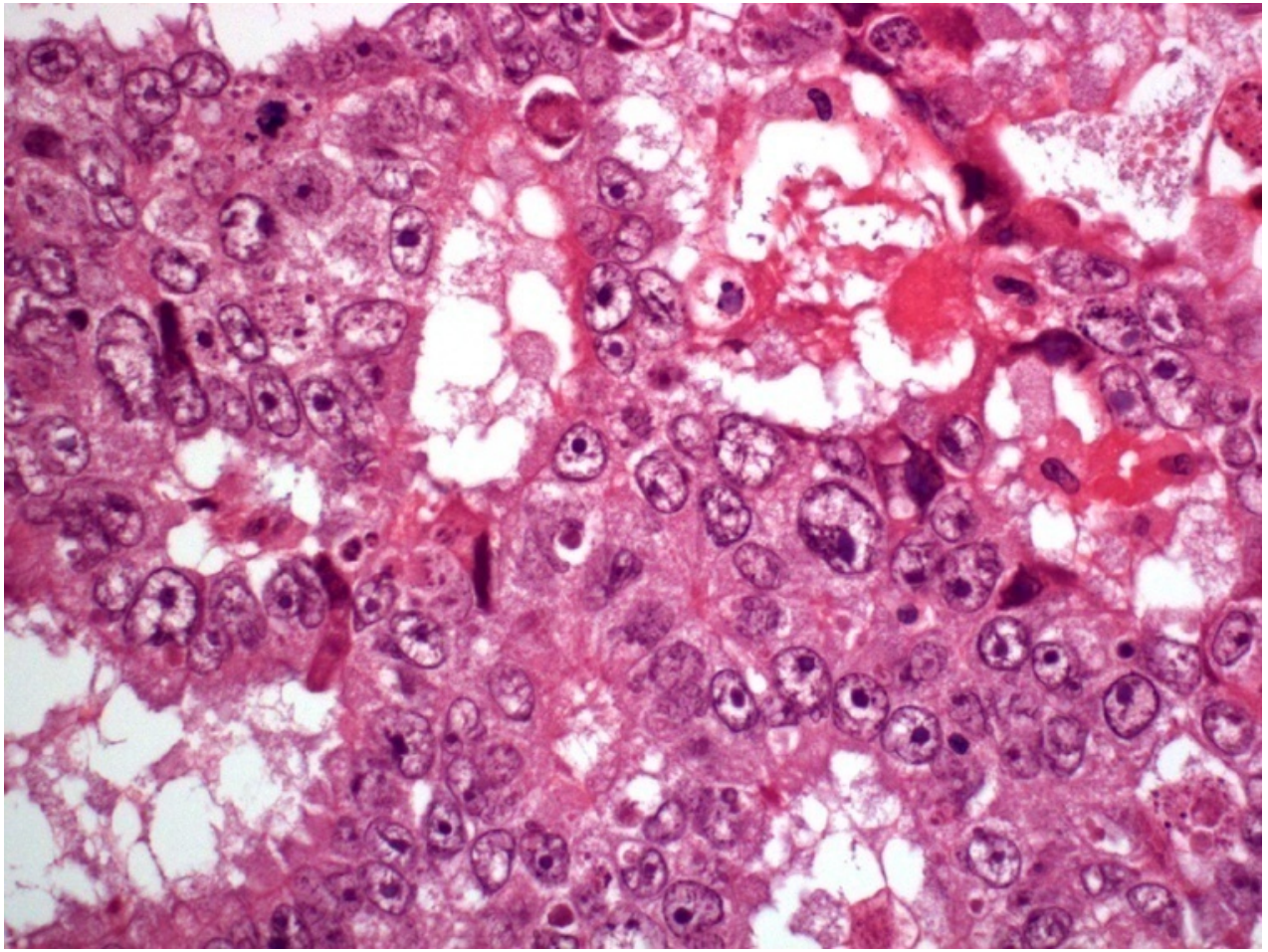
T1



T1



T1

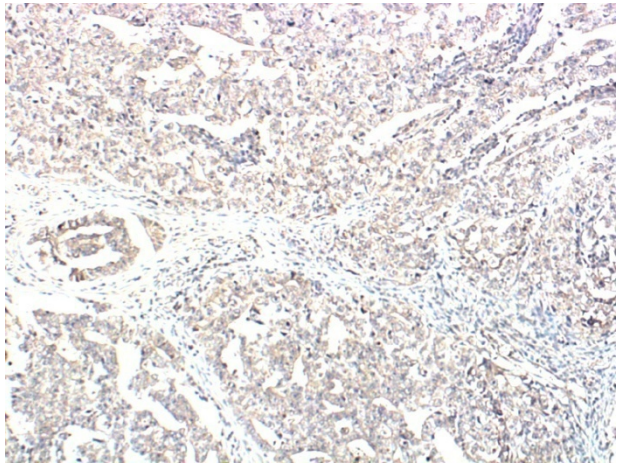


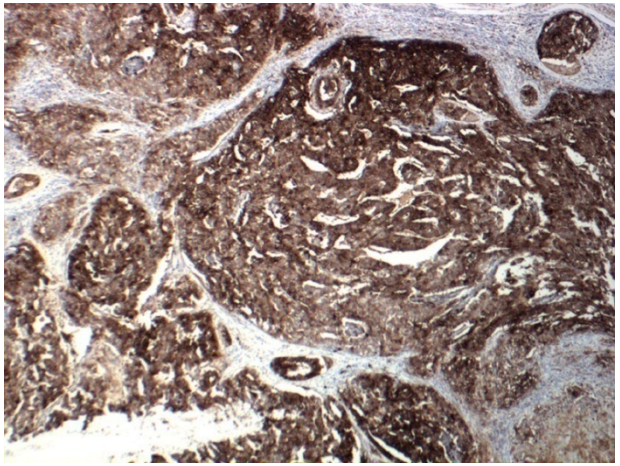
T1

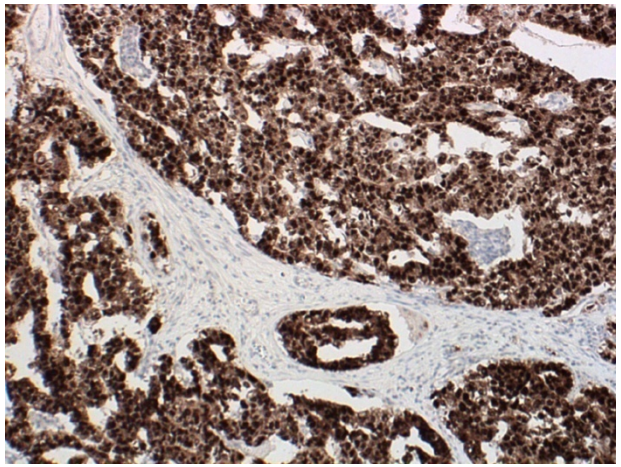
Mixed germ cell tumour

- Embryonal carcinoma
- Seminoma

Embryonal carcinoma







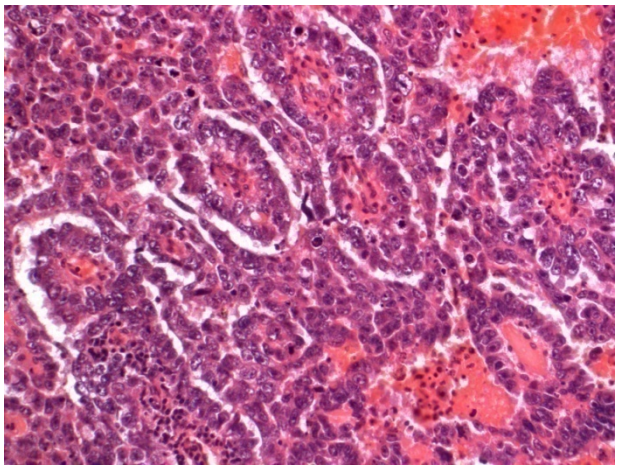
AFP-

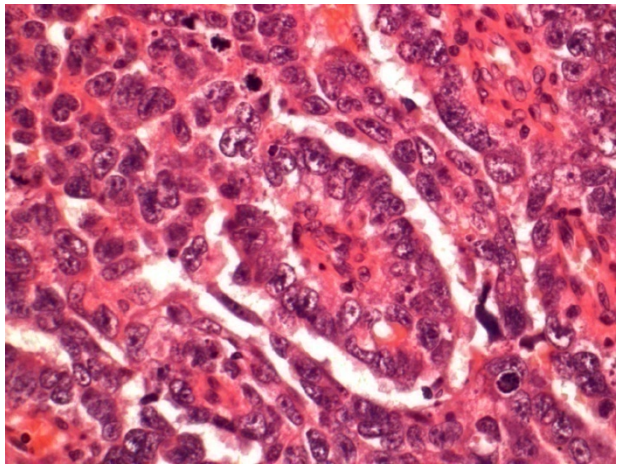
CD30+

OCT3/4 + (nuclear)

Embryonal carcinoma

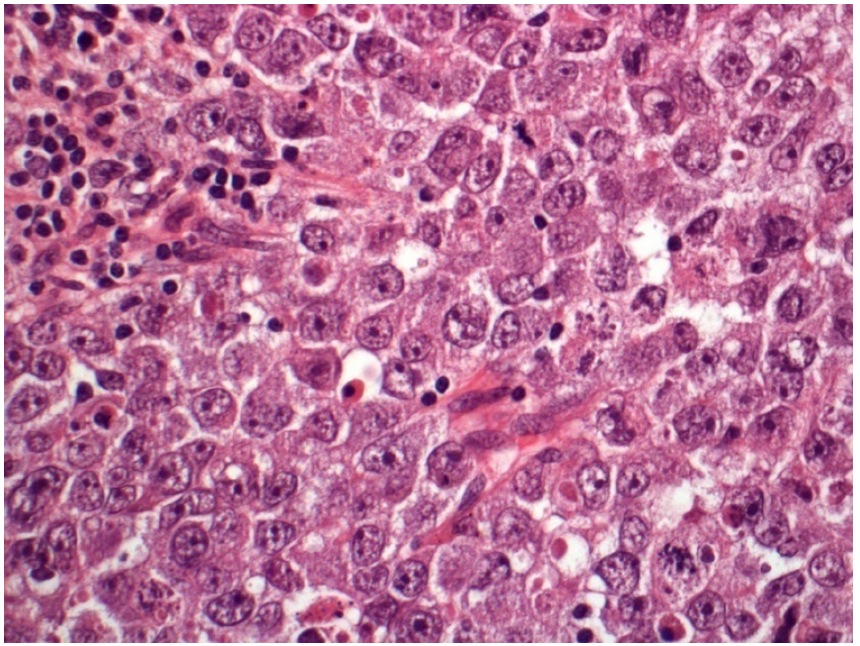
- **IHC**
  - CD30 +
  - PLAP +/-
  - OCT 3/4 +
  - CD117 –
  - AFP –
  - Pancytokeratin +
  - EMA -
- **DD**
  - Seminoma
  - Yolk sac tumour
  - Metastatic carcinoma





Seminoma

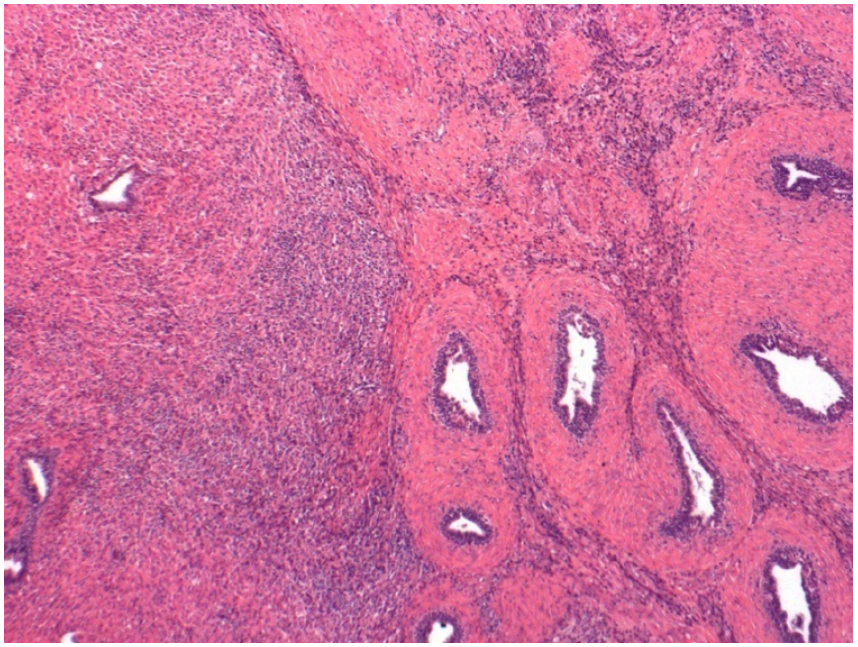
- **IHC**
  - PLAP +
  - CD117 +
  - OCT3/4 +
  - CD30 –
  - AFP-
- as with GCNIS
- **DD**
  - Embryonal carcinoma
  - Yolk sac tumour
  - Sex cord stromal tumour
  - Spermatocytic tumour



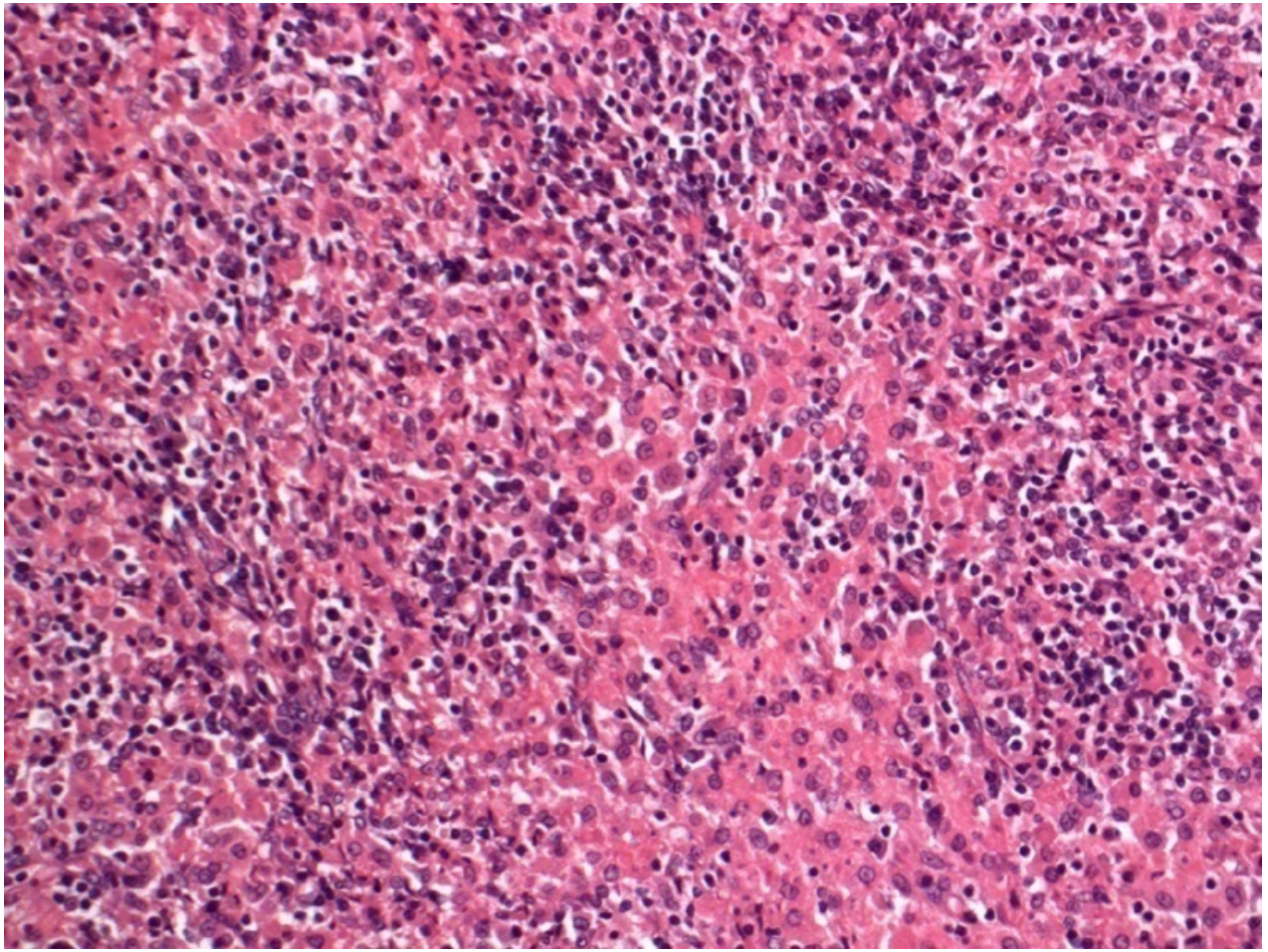
T9

- Male 82yrs

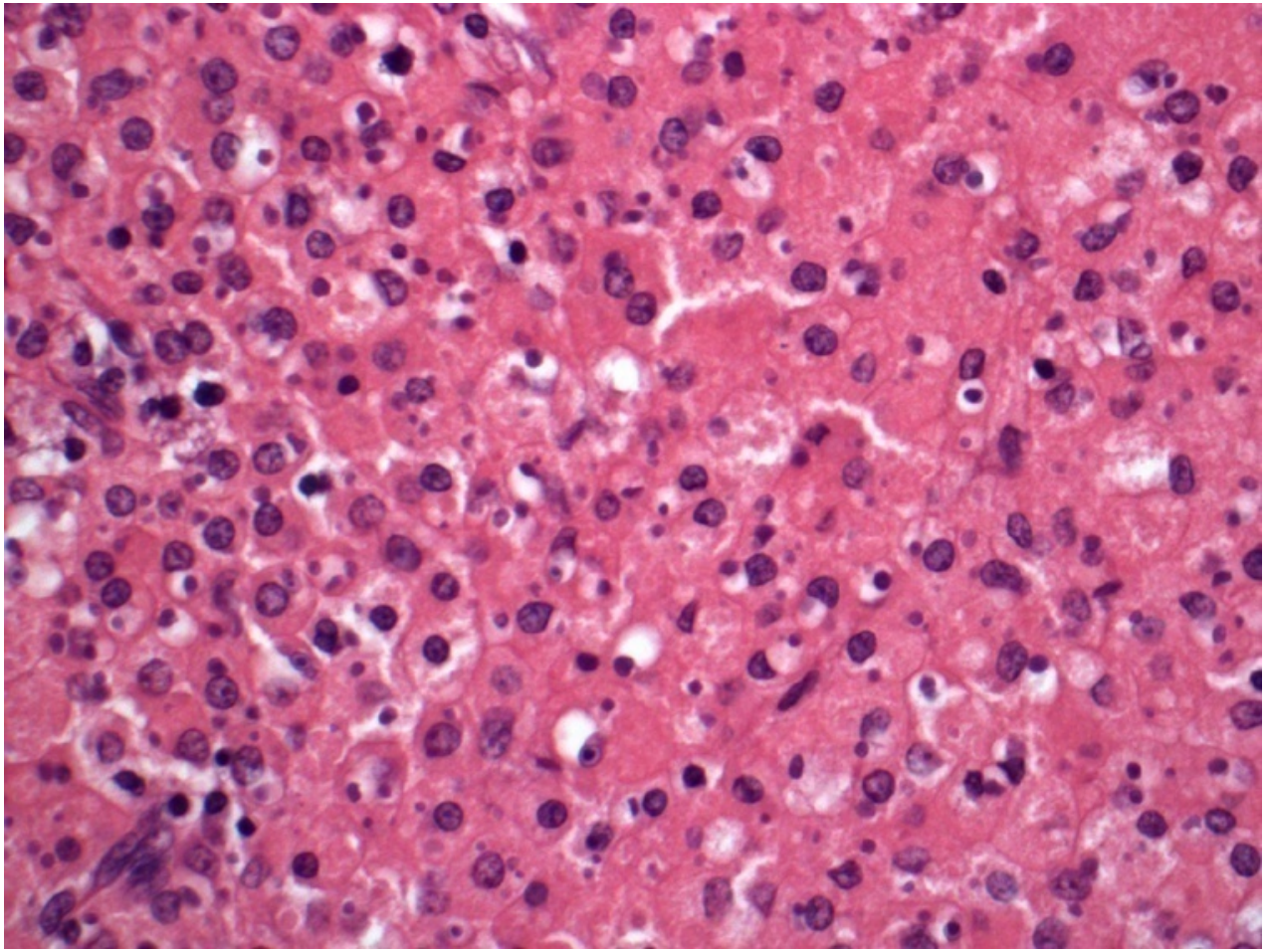
- Left testis mass
- Previous epididymo-orchitis



T9



T9



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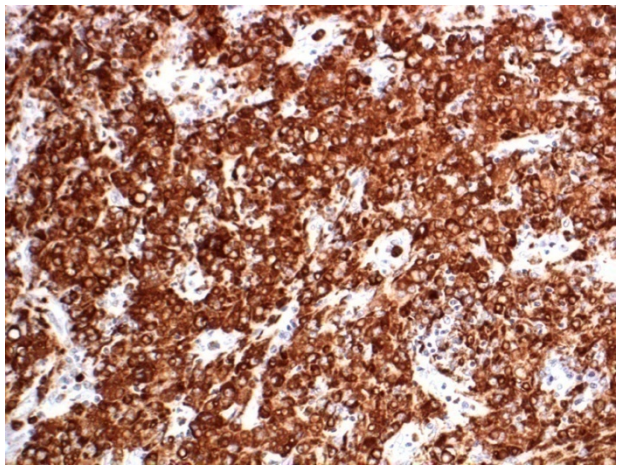
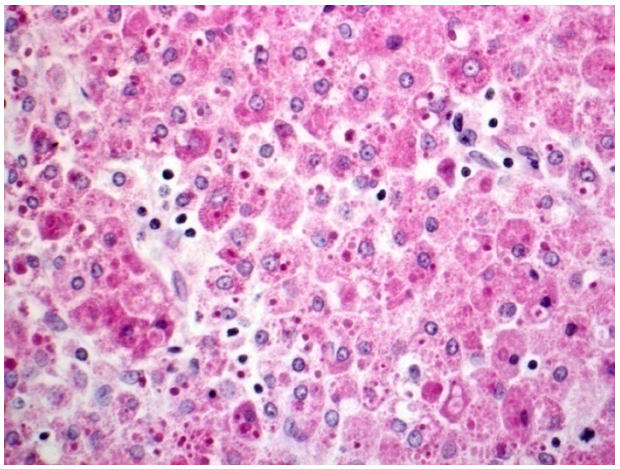
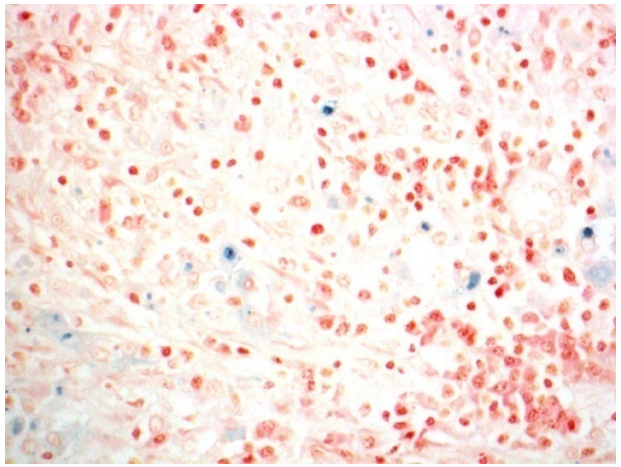
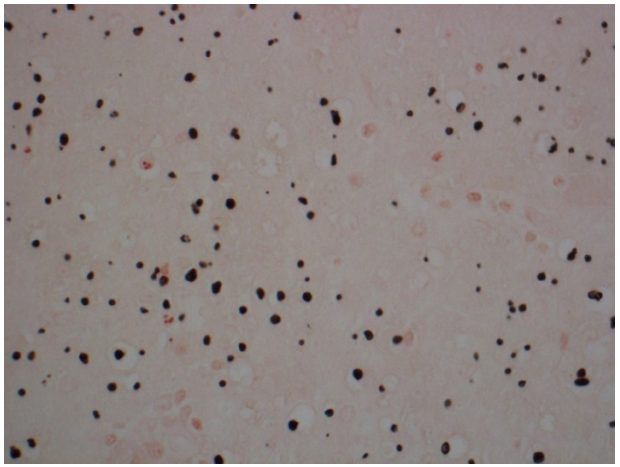








T9

Malakoplakia

- Middle aged men in testis (most urinary tract foci in females)
- Michaelis-Gutmann bodies
  - von Kossa + Perls + PAS +
- Histiocytes – von Hansemann cells CD68+
- Inflammation
- Occurs in urinary tract, usually bladder (renal rare)

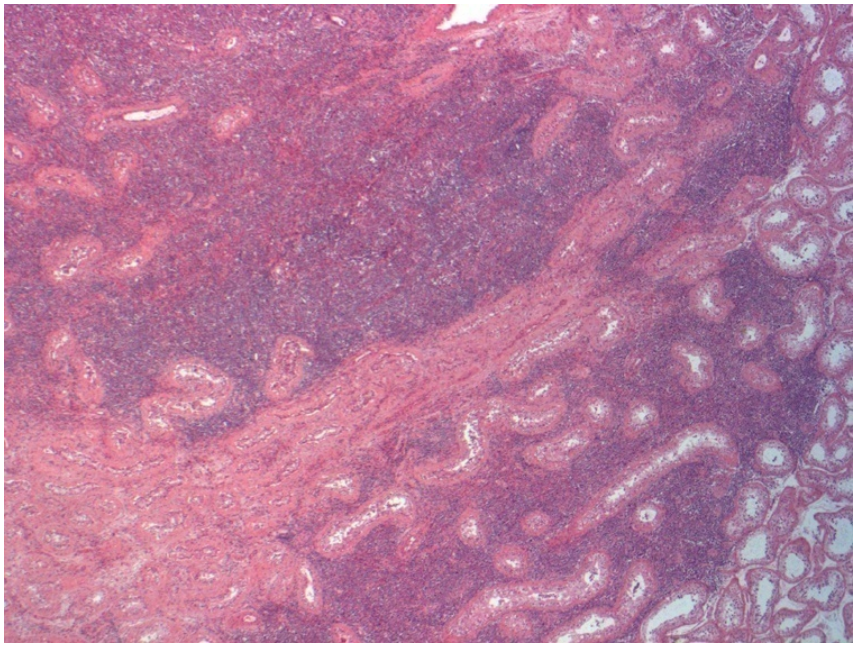
DD

- Seminoma
- Leydig cell tumour
- Granulomatous orchitis

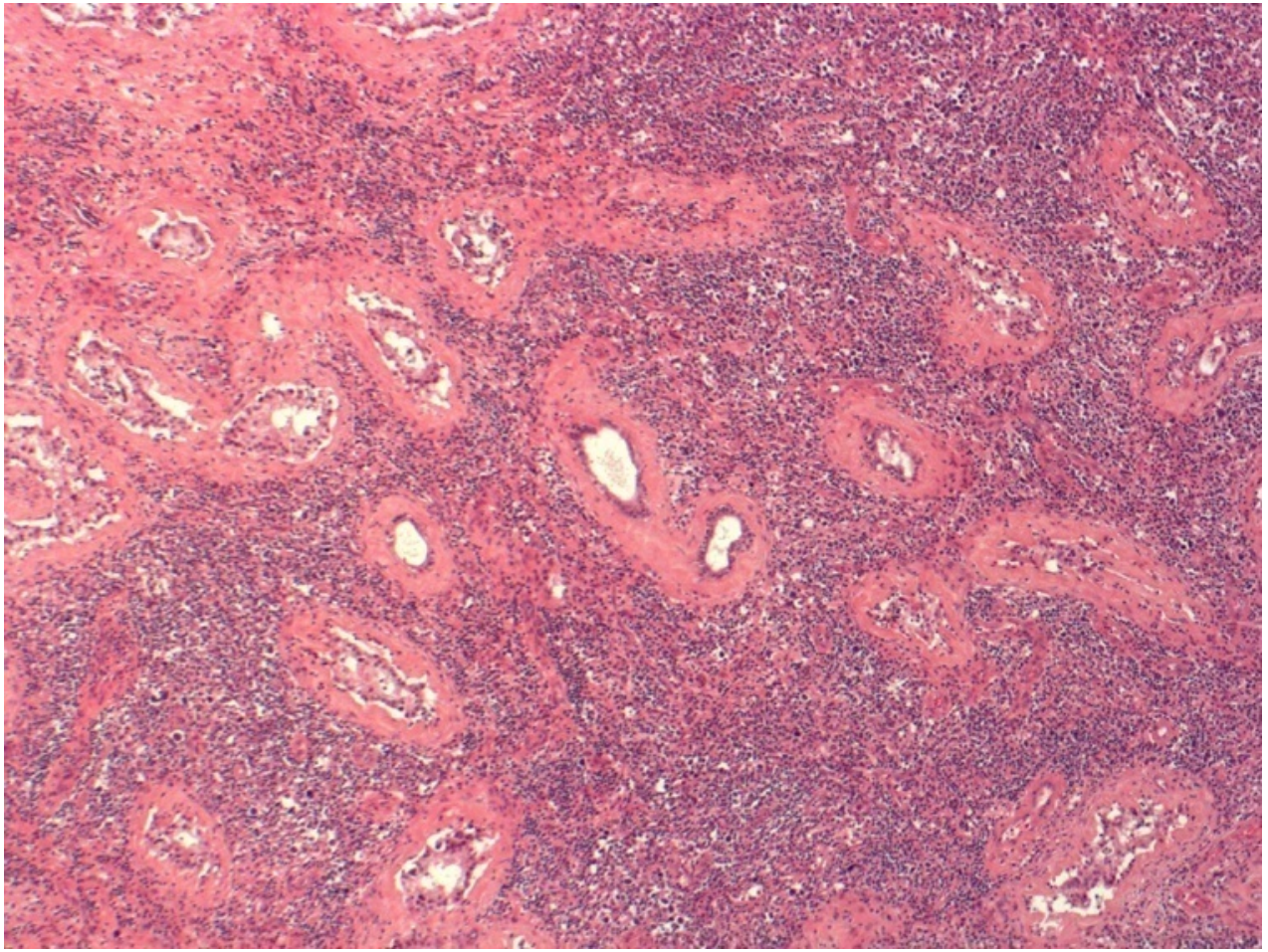
T13

- Male, 58 yrs

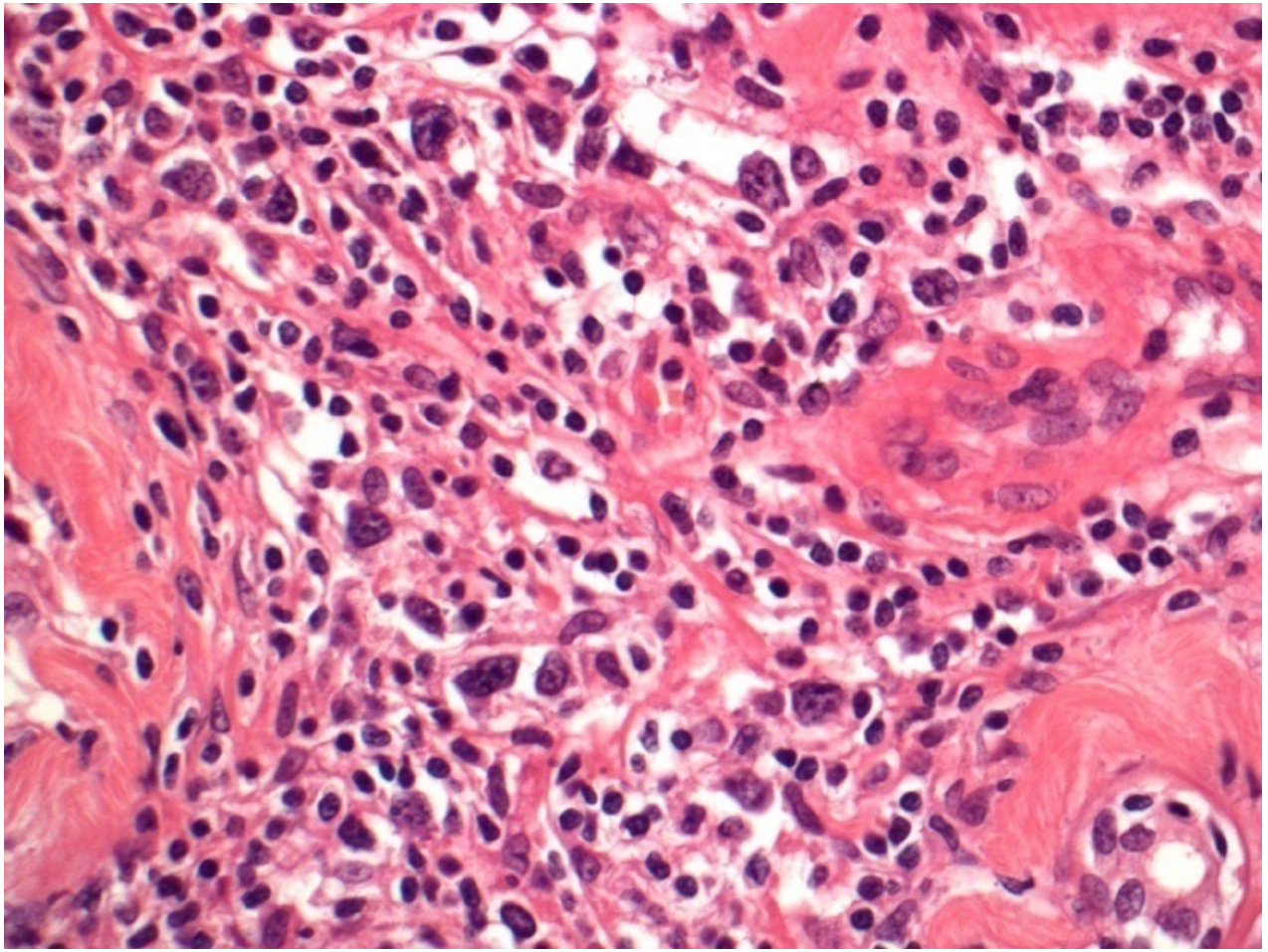
- Mass right testis
- Tumour markers negative



T13



T13



T13

Diffuse large B-cell NHL

This case IHC:

- CD45 +
- CD 20 +
- BCL2 +
- BCL6+
- MUM-1 +
- CD5 -

T13

NHL in testis

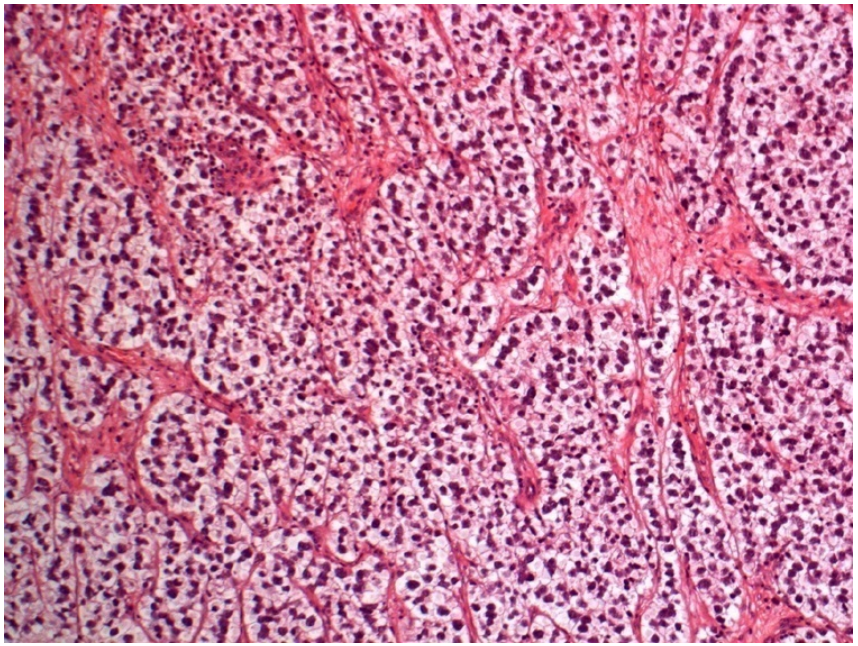
- Usually diffuse large B-cell
- Older age group
- Primary or secondary
- Interstitial pattern; no GCNIS
- Often involves epididymis and spermatic cord

DD

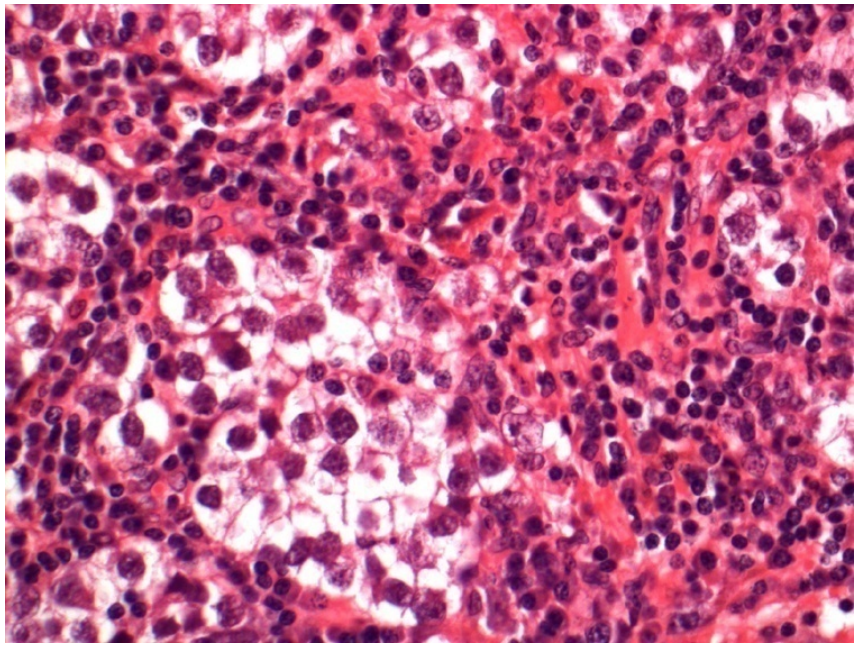
- Seminoma
- Spermatocytic tumour
- Inflammation

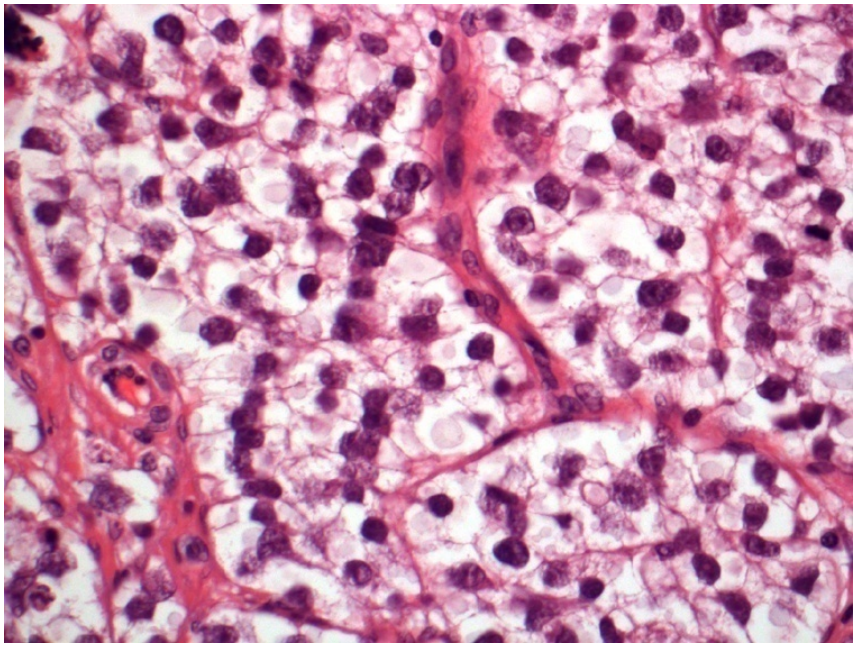
T12

- Male 37 yrs
- Gynaecomastia
- Left orchidectomy

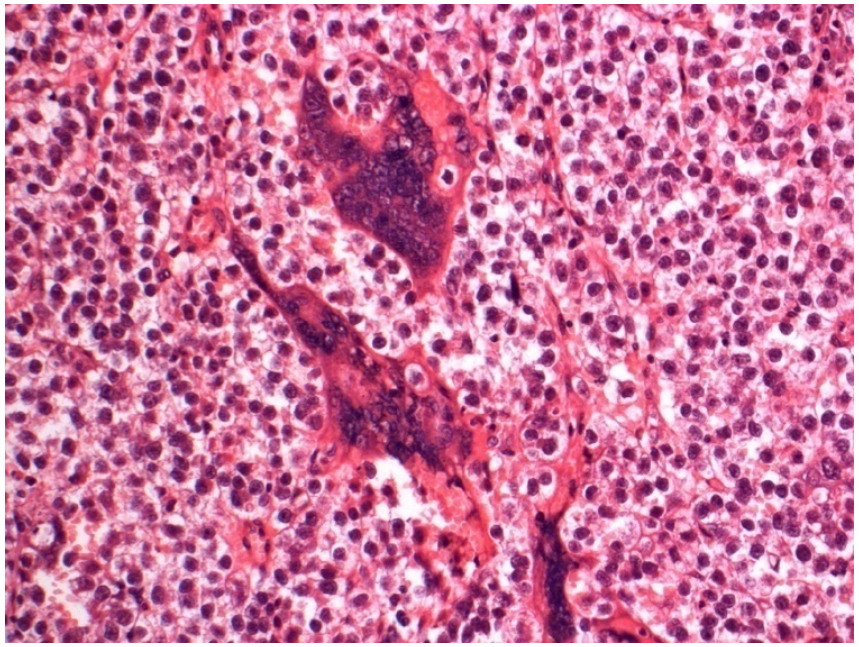


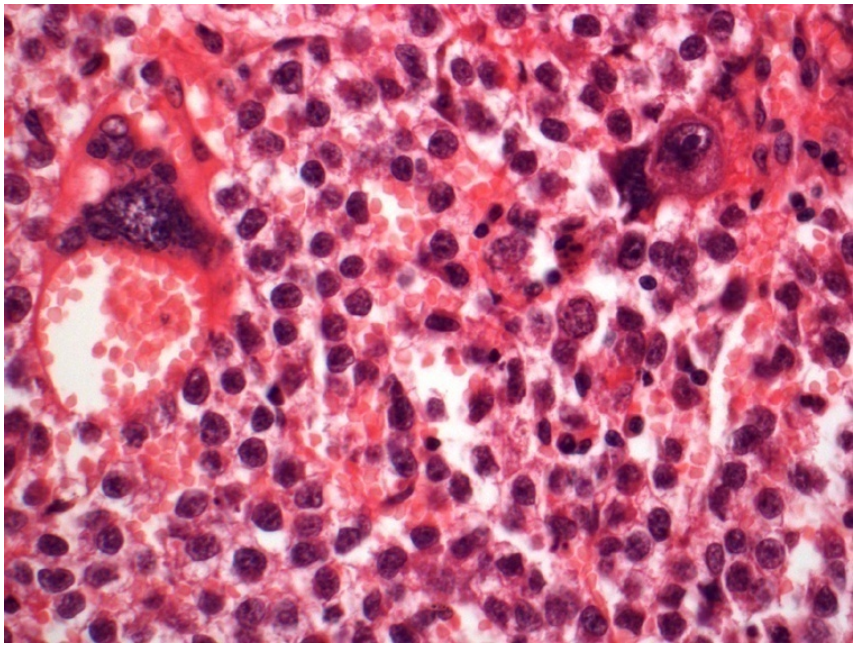
T12





T12





T12

Seminoma with syncytiotrophoblastic cells

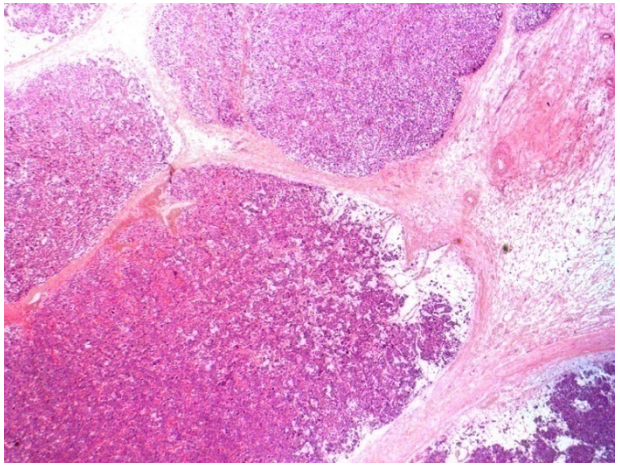
- Approximately 5% of seminoma (> if IHC used)
- Slight rise in serum HCG
- Can be ‘mulberry’ type small cells secreting HCG
- No prognostic significance

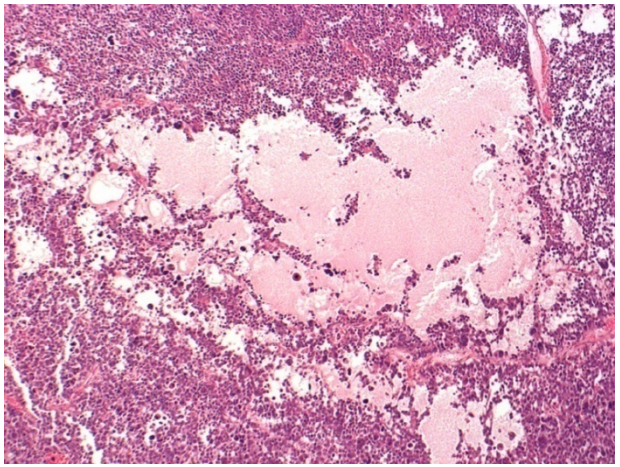
- Still classified as seminoma in WHO

T11

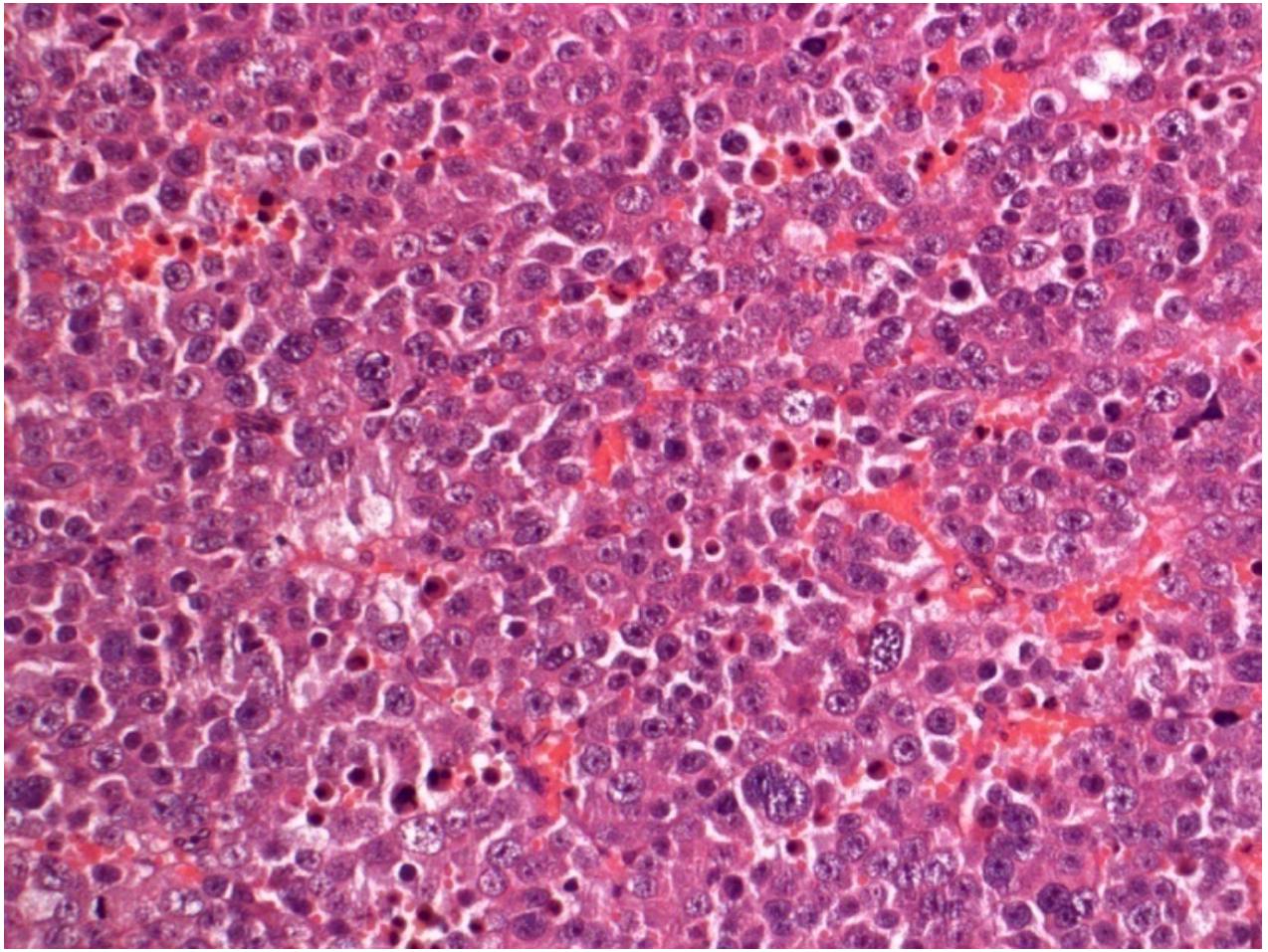
- Male 64yrs

- Right testis mass
- LDH raised - 240
- AFP and HCG normal

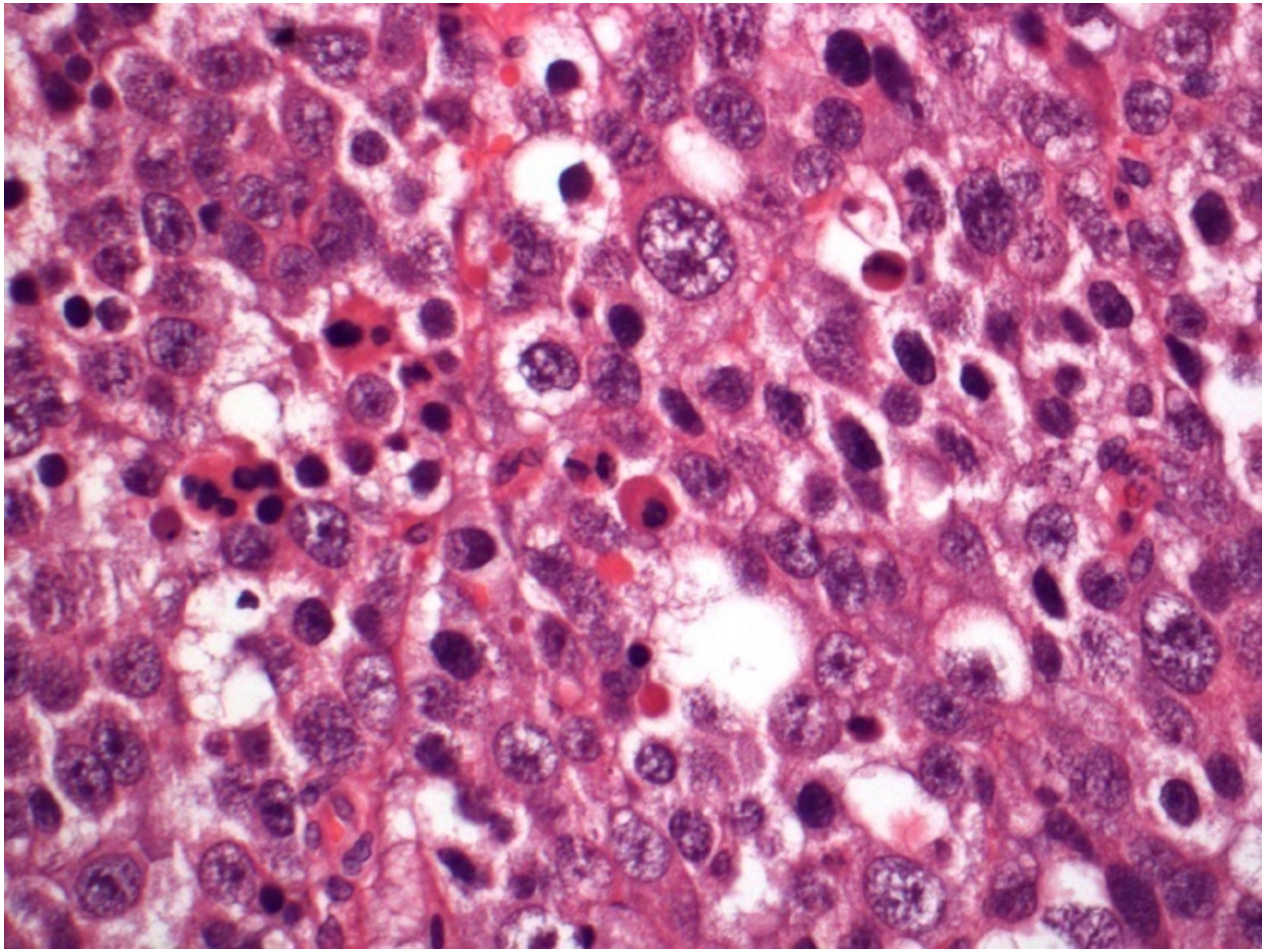




T11



T11



T11

Spermatocytic tumour

- Rare; only in testis (not ovary or extra-gonadal)
- Wide age range usually >50yrs

- Polymorphous cells - 3 types
- Filamentous ‘spireme’ chromatin in large cells
- Can show intra-tubular growth
- No GCNIS

T11

IHC

CD117 +/-

SALL4 + (nuclear)

PLAP – AFP – OCT 3/4 – HCG – CD30 – Cytokeratin – Vim –

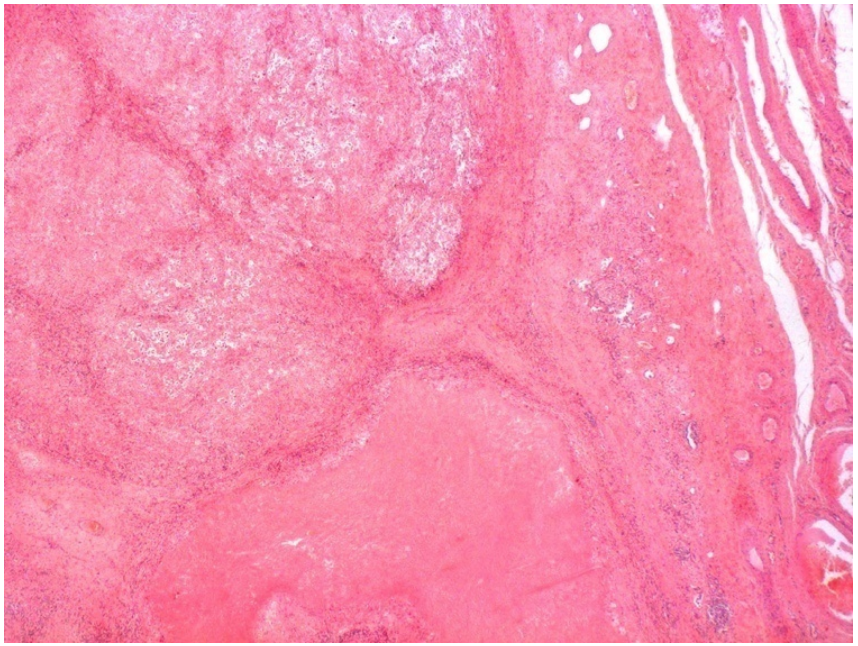
DD

- Seminoma (lymphocytes, granulomas, monomorphic)
- Embryonal carcinoma
- NHL

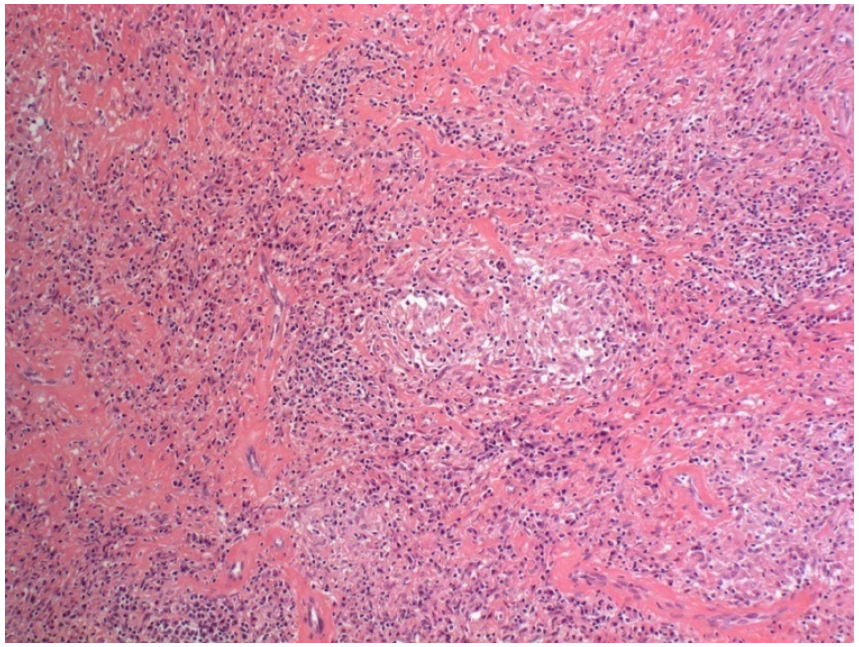
- Rare sarcomatoid transformation

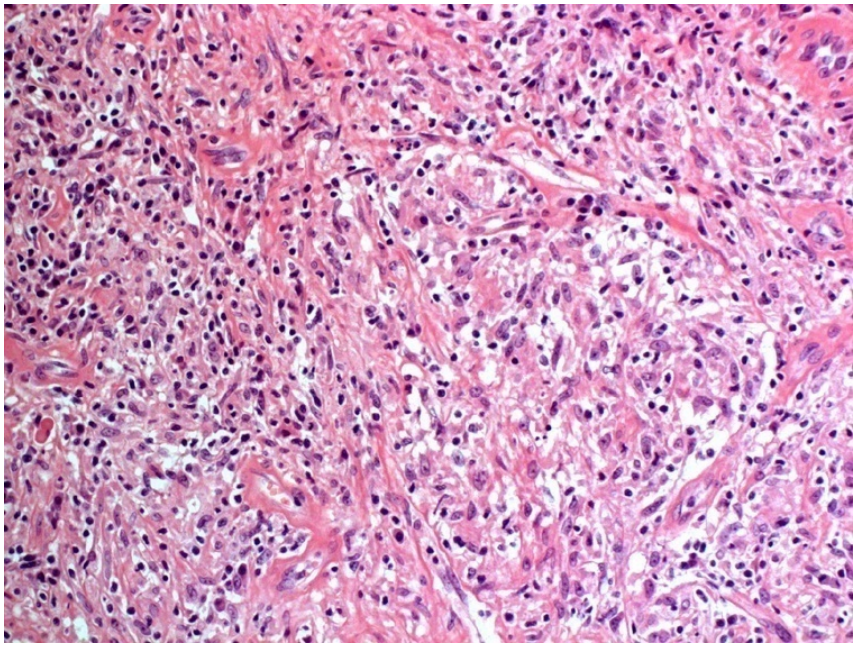
T4

- Male 41 years
- Left testis mass, 20mms

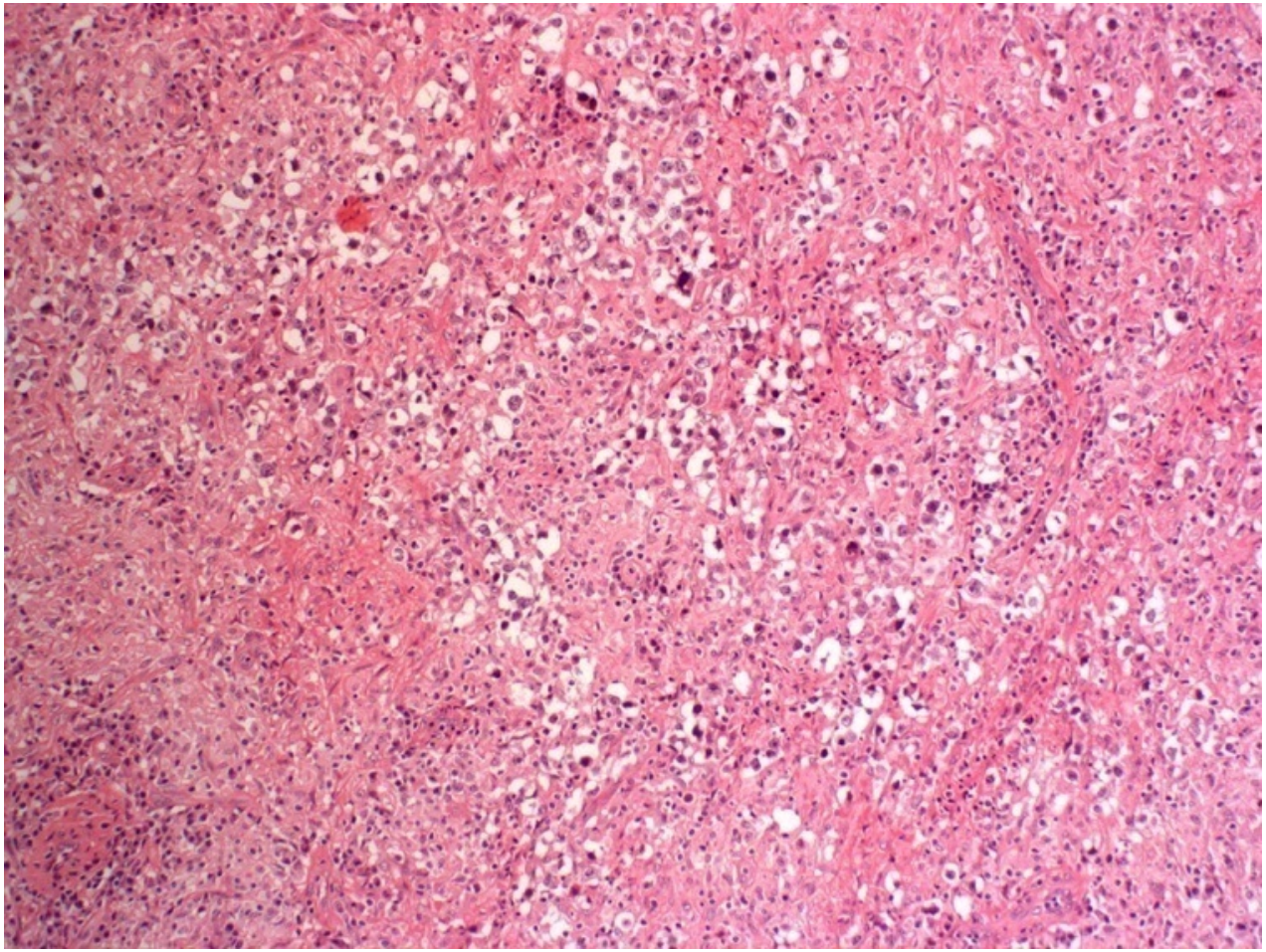


T4

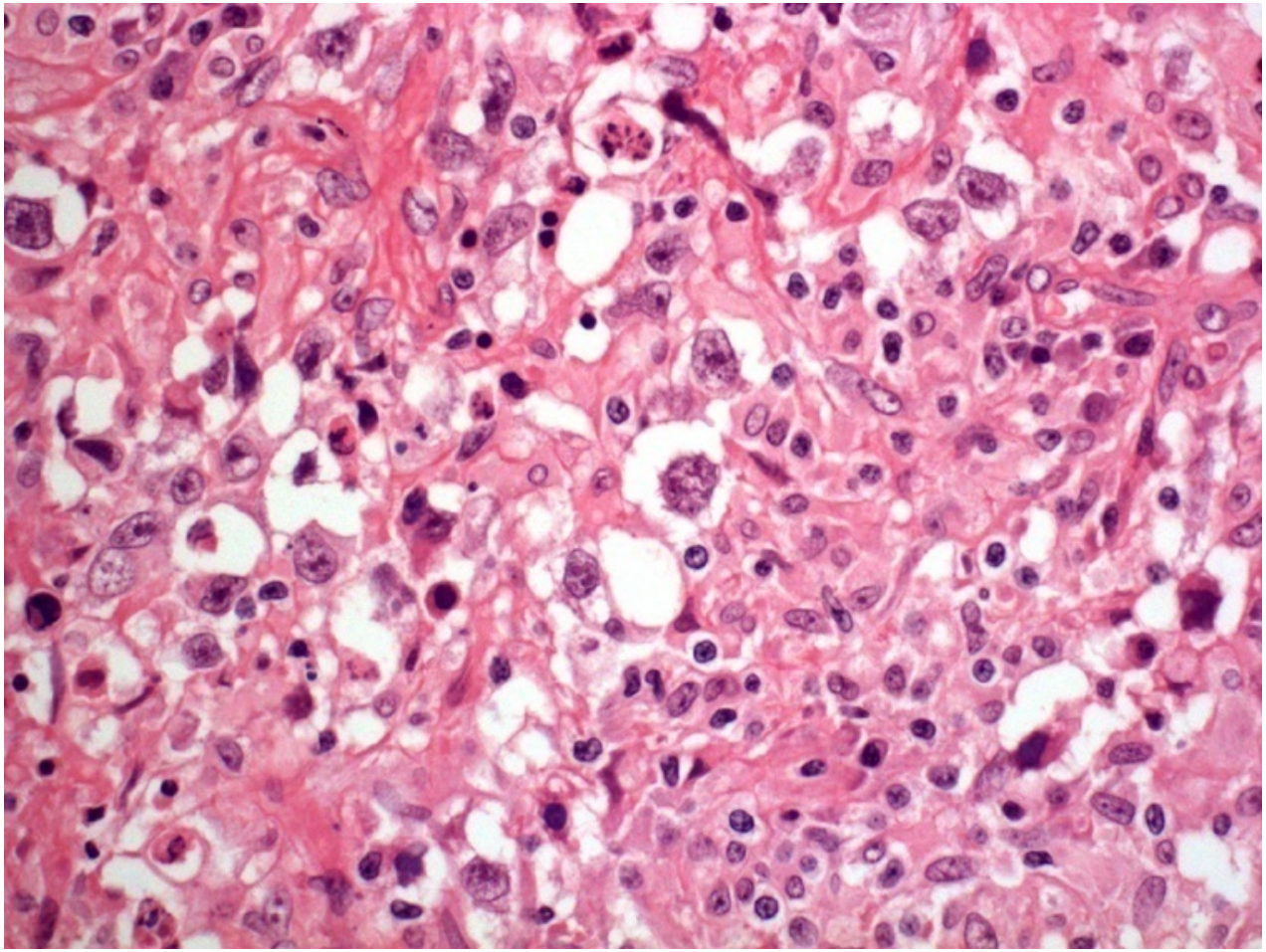




T4



T4



T4

Seminoma with florid granulomatous inflammation

DD

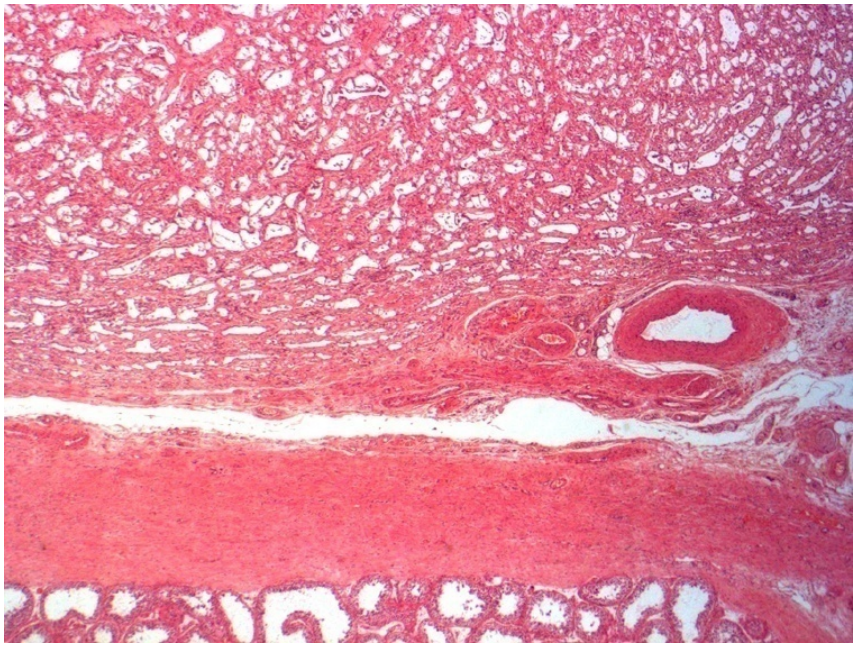
- Granulomatous orchitis
- Sarcoidosis
- Lymphoma
- Sperm granuloma
- Malakoplakia

Other features of seminoma

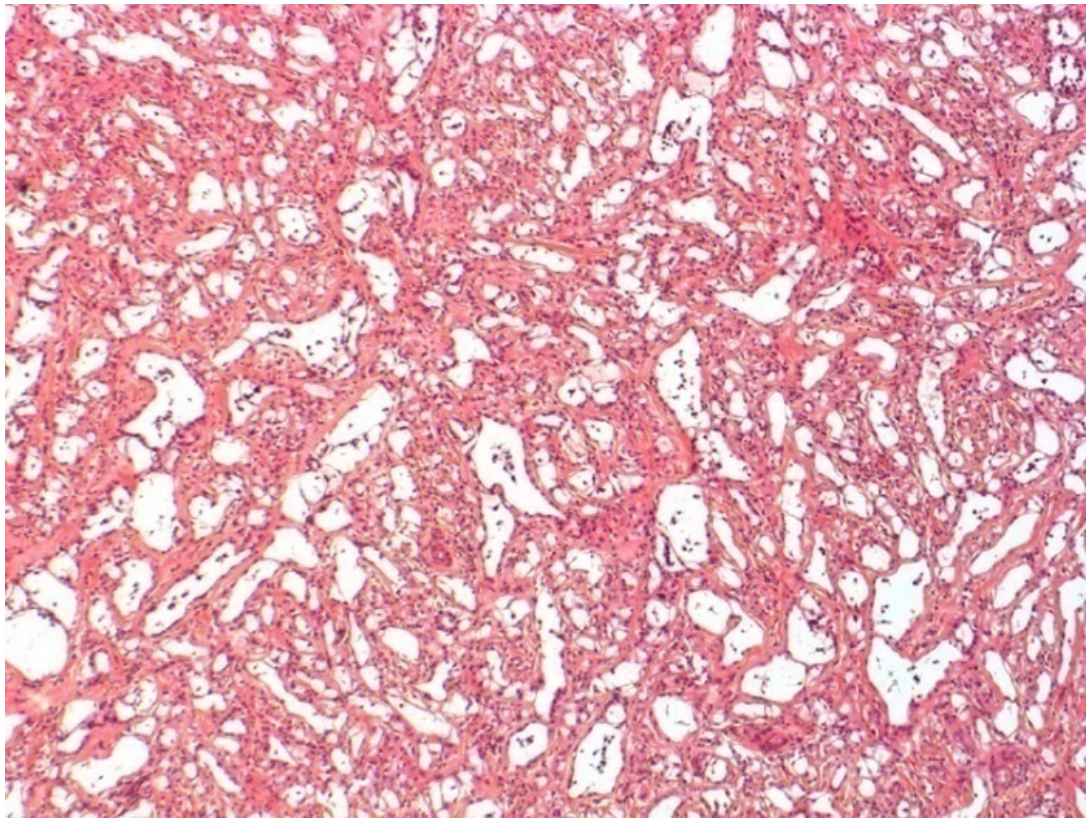
- Interstitial growth
- Intratubular growth
- Sclerosis
- Regression

T18

- Male 78yrs
- Right orchidectomy for right epididymal mass

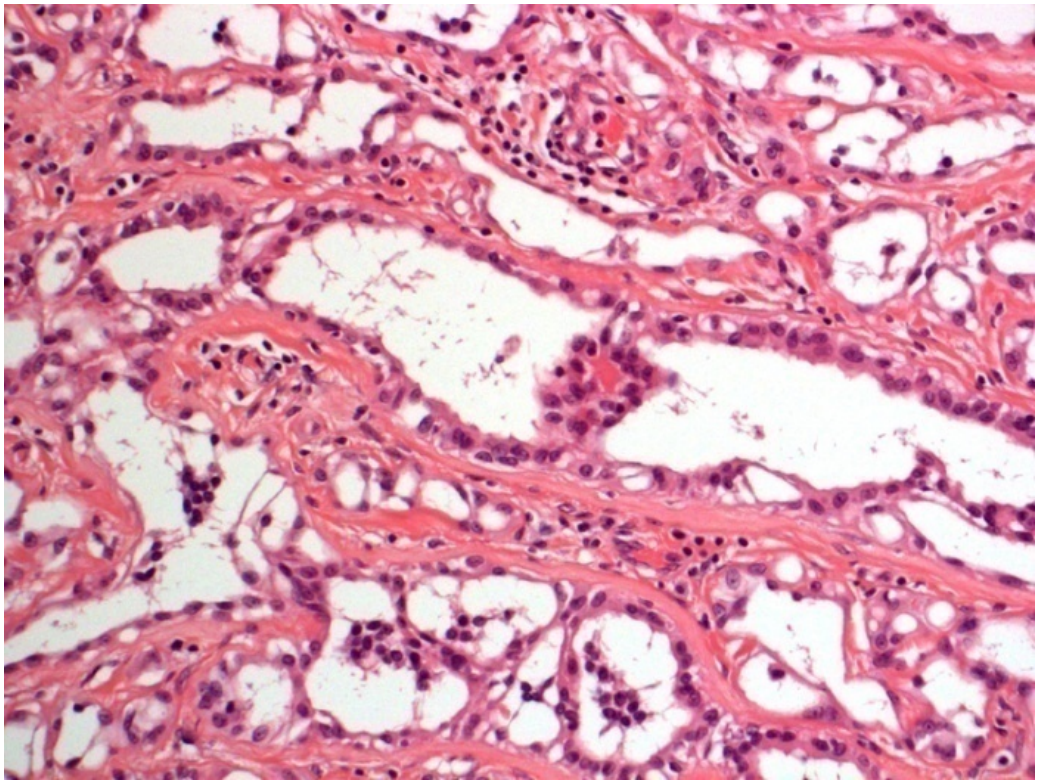


T18



T18

- Cytokeratin +
- Calretinin +
- CD31 -



T18

Adenomatoid tumour

- Benign mesothelial origin
- Usually paratesticular
- Prominent stromal component
- Cells may be vacuolated

IHC

- Calretinin + WT-1 + Cytokeratin AE1/3 + EMA + D2-40 + CK5/6+
- Inhibin - BerEP4 – CD31-

DD

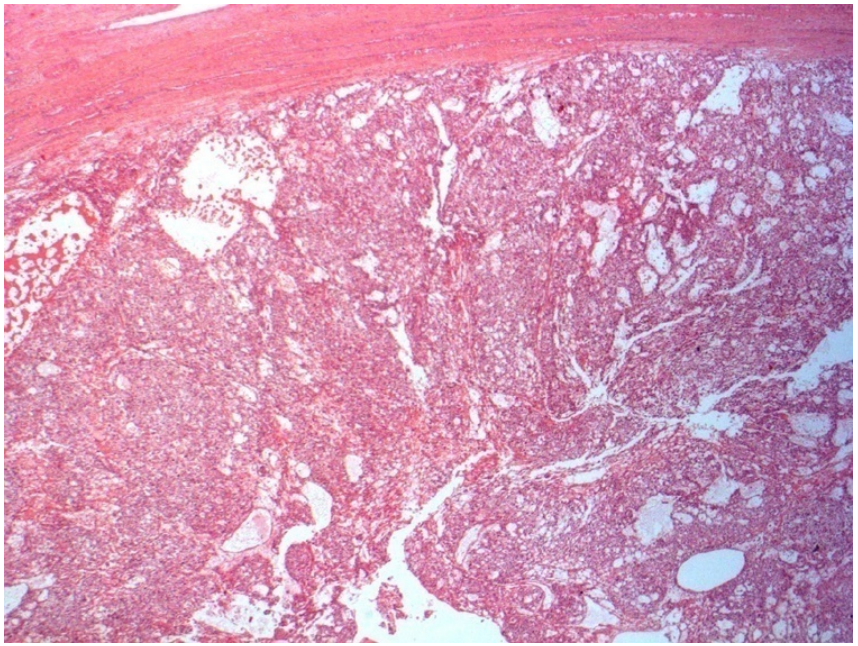
- Sertoli cell tumour
- Metastatic signet ring carcinoma
- Yolk sac tumour
- Leiomyoma
- Haemangioma
- Malignant mesothelioma

T10

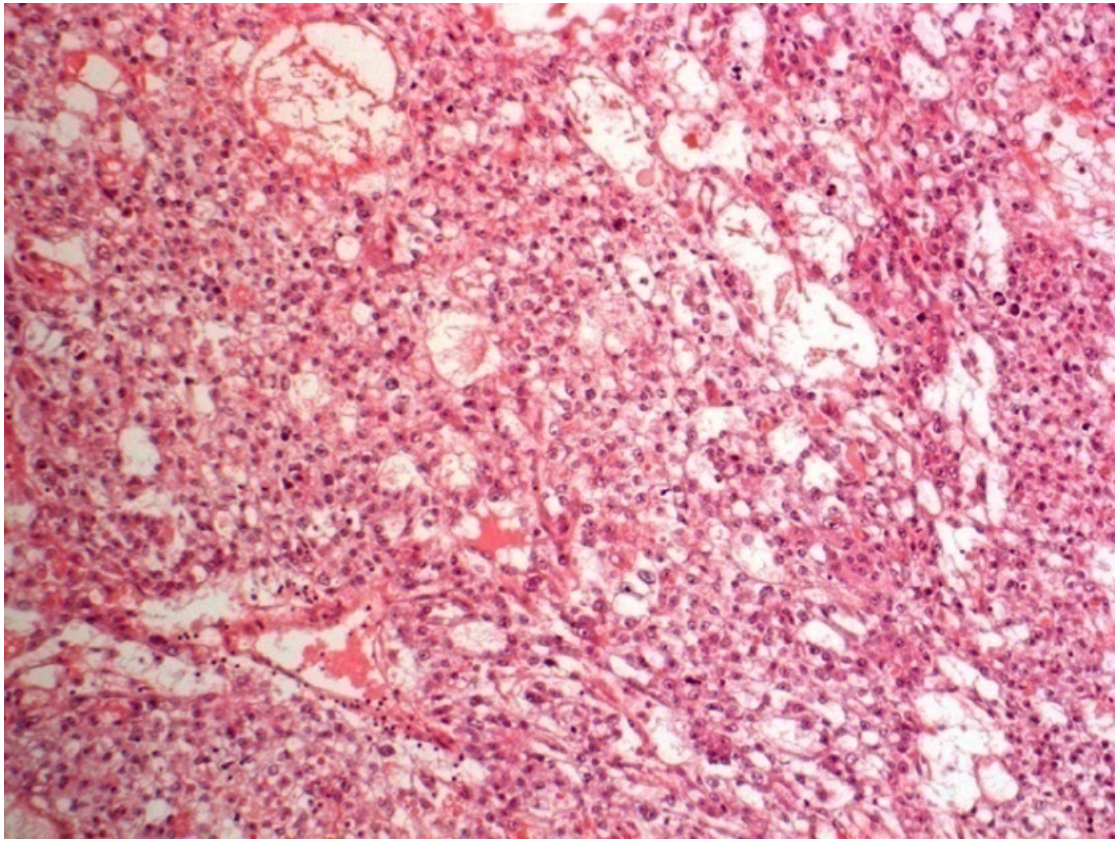
- Male 39 yrs

- Right testis mass
- Raised tumour markers

- Section of right testis



T10



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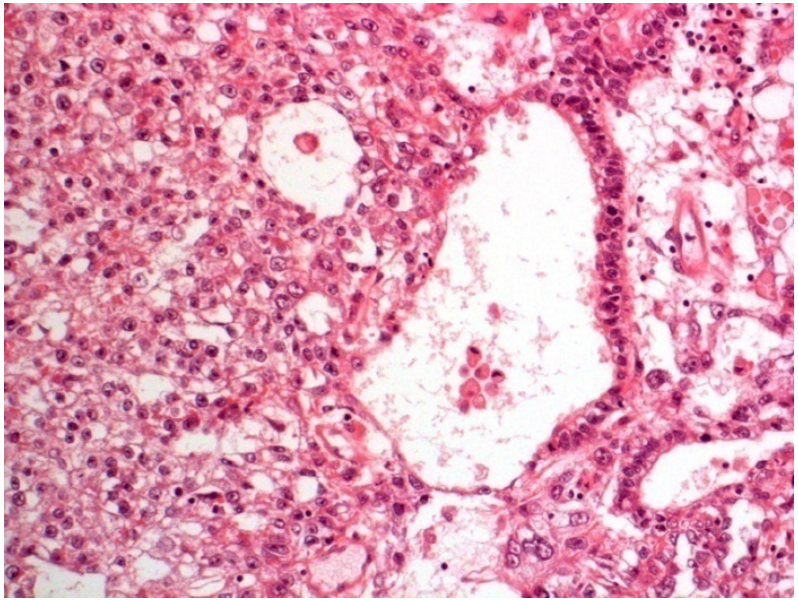

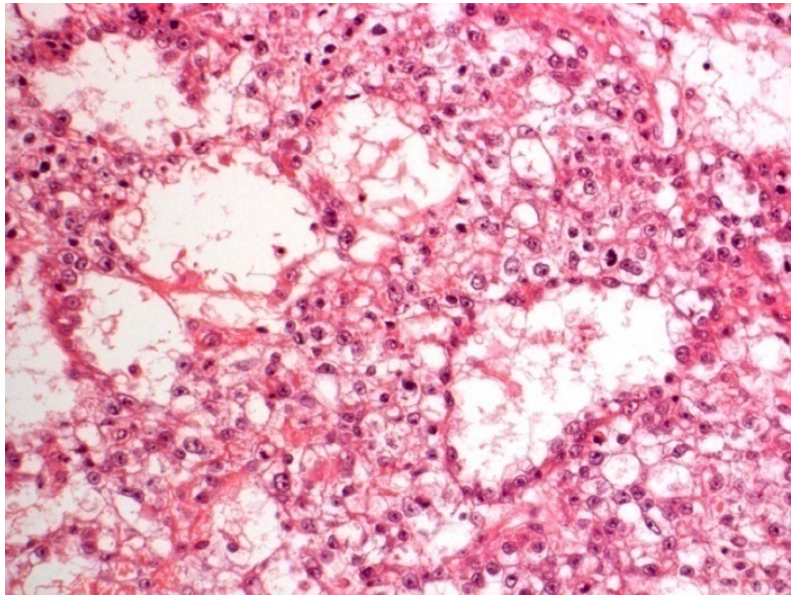

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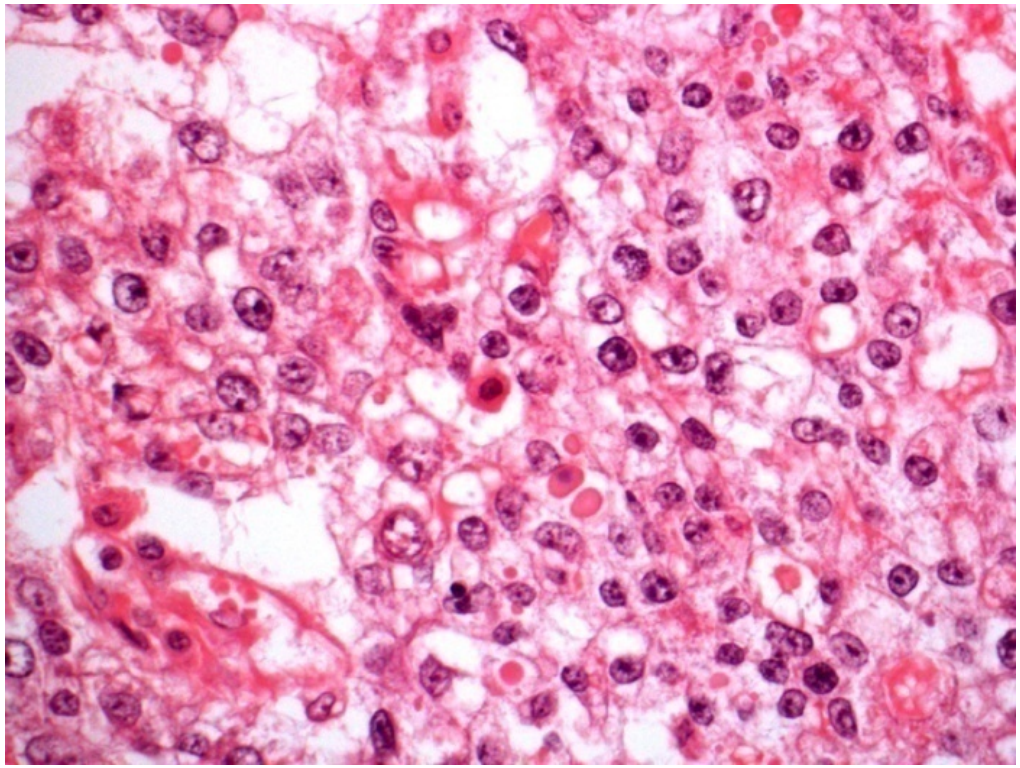


T10

Yolk sac tumour (had minor teratoma component elsewhere)

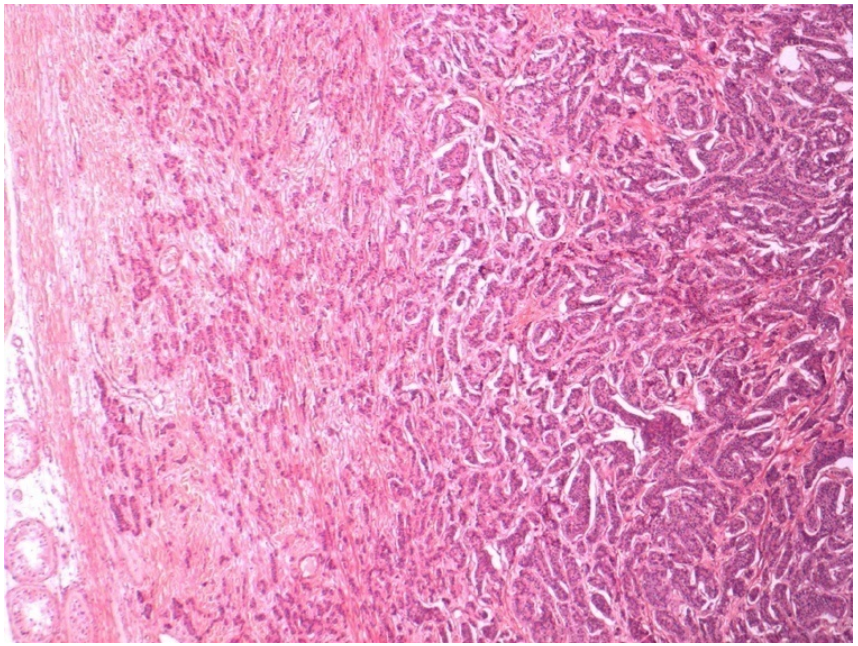
- Usually in mixed germ cell tumours – pure in childhood
- Raised serum AFP
- Variable patterns – mimicking other germ cell tumours and sex cord stromal tumours

IHC

- AFP + Glypican-3 + SALL4 +
- PLAP +/-
- OCT 3/4 –
- Pancytokeratin positive

T17

- Male 56 yrs
- Mass right testis



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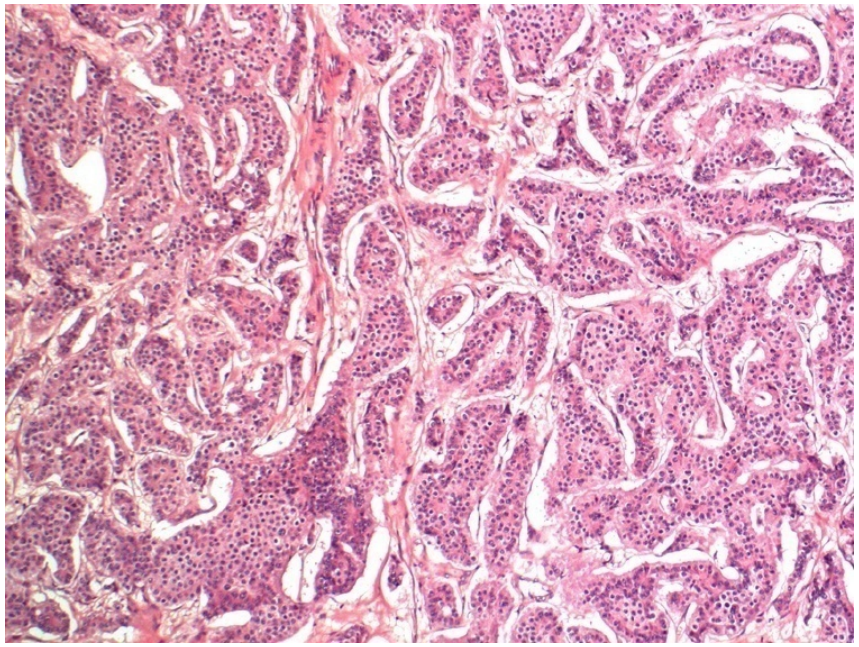
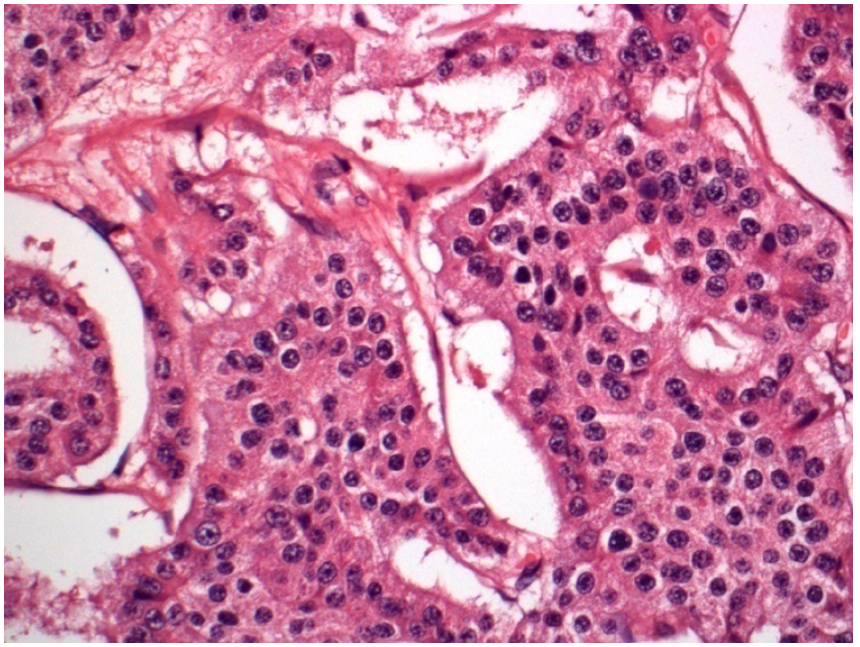




T17

Carcinoid/neuroendocrine

- Pure (monodermal teratoma – 70%)
- Part of teratoma – 20%
- Metastatic 10 % (bilateral/multifocal/vascular invasion)
- Can have carcinoid syndrome

- Insular pattern etc/ salt and pepper chromatin
- Size more indicative of aggressive behaviour, rather than necrosis, vascular invasion or tunica invasion

IHC

Cytokeratin + Synaptophysin + Chromogranin + CD56 +

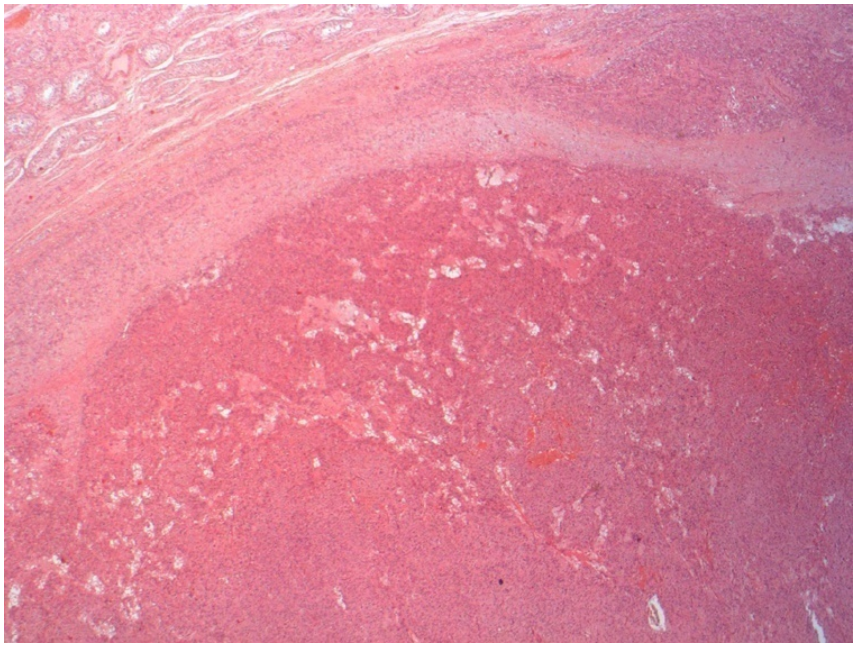
DD

- Leydig cell tumour
- Sertoli cell tumour

T16

- Male 37 yrs

- Left testis mass
- Serum markers negative



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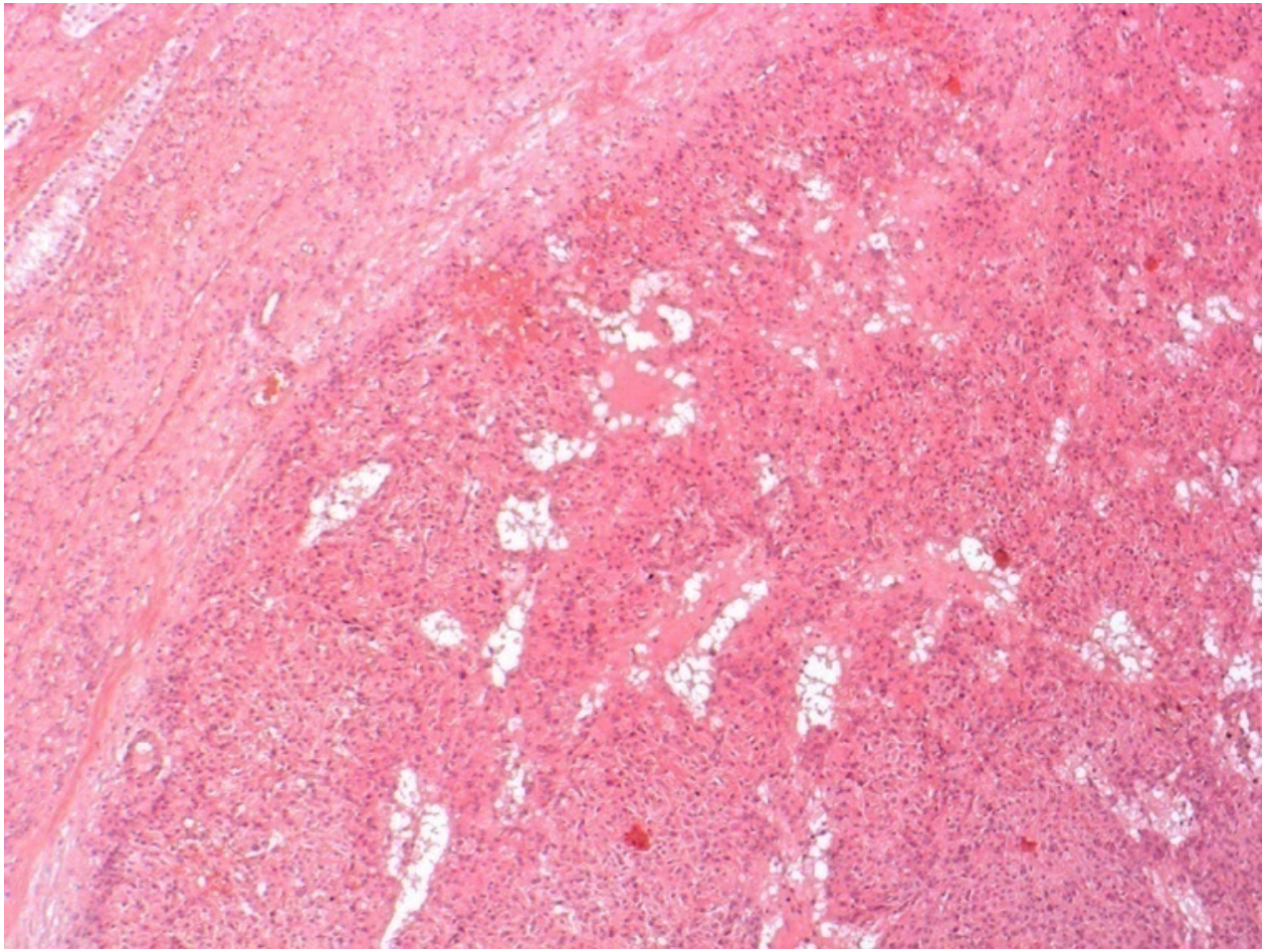

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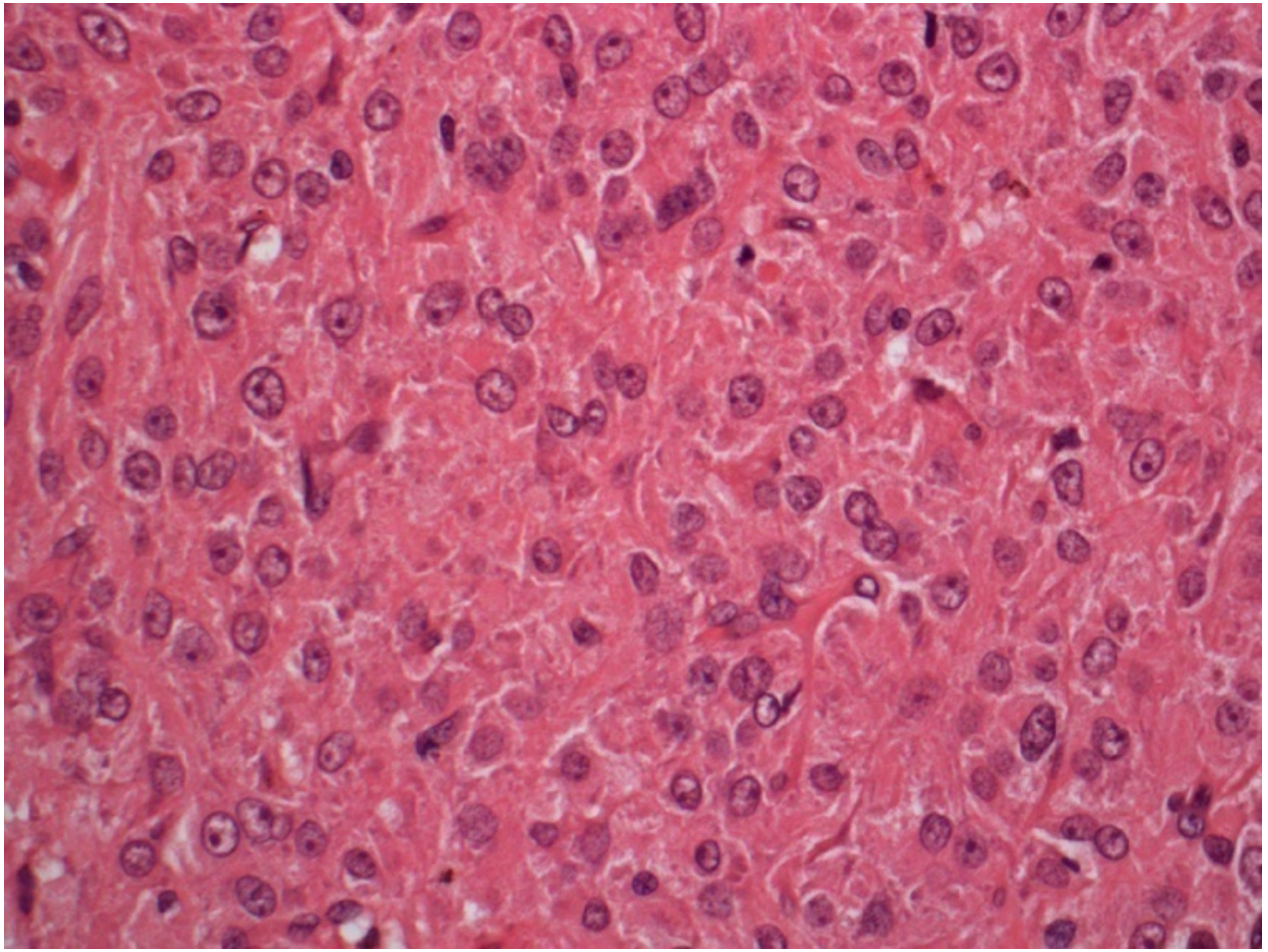


T16

Leydig cell tumour

- Commonest SCST
- Can have gynaecomastia, precocious puberty
- Usually benign, 10% malignant (metastasis to diagnose)
- Solid, large cells, eosinophilic cytoplasm, Reinke crystals (30% approx)
- Size important for likely behaviour

IHC

Calretinin + inhibin + Melan-A + Vimentin + CK+ S100+ CD99+

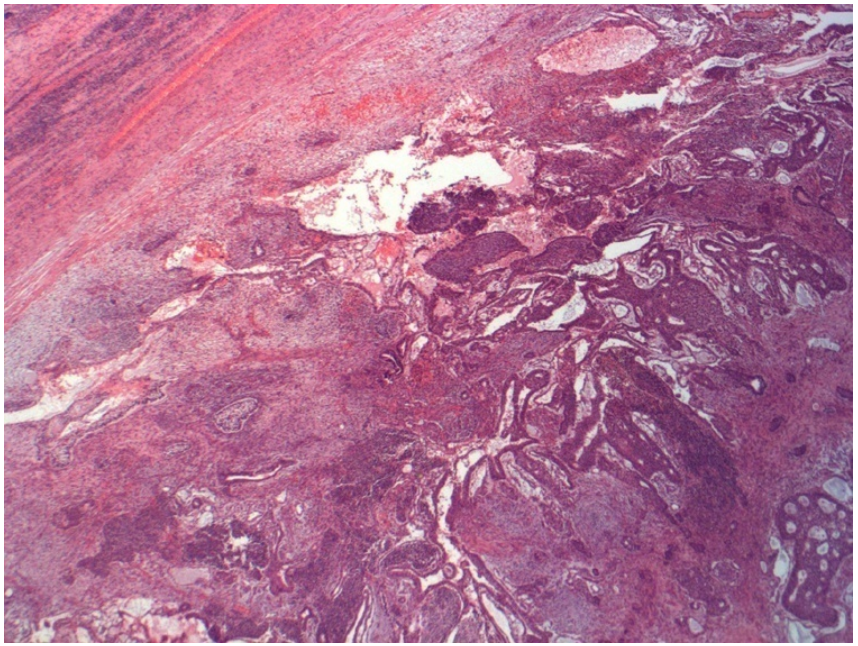
DD

- Testicular tumours in adreno-genital syndrome (CAH) - multinodular
- Malakoplakia
- Hepatoid yolk sac tumour
- Carcinoid tumour
- Metastatic melanoma

T15

- Male 42 yrs

- Right testis mass
- AFP 40



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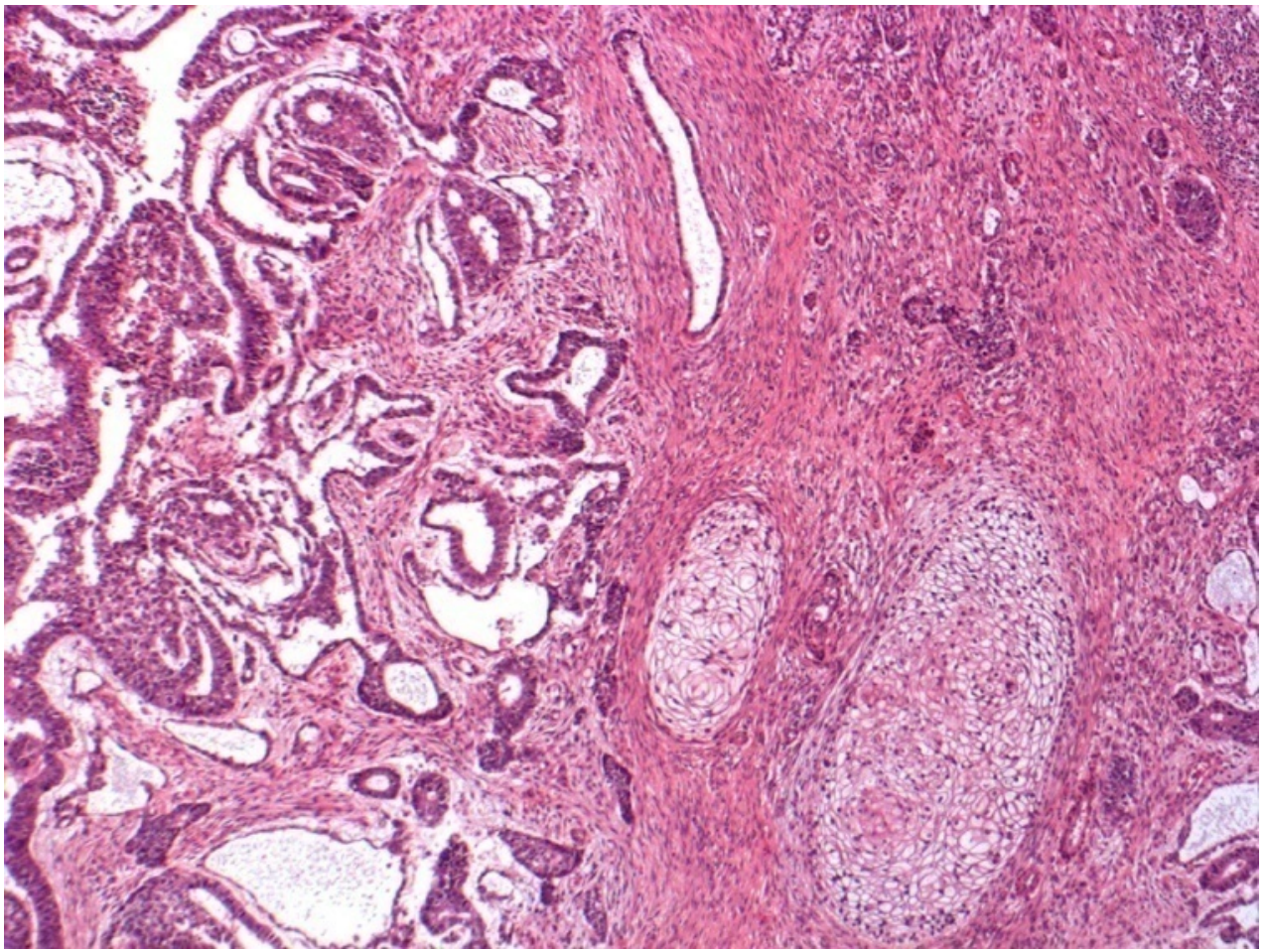

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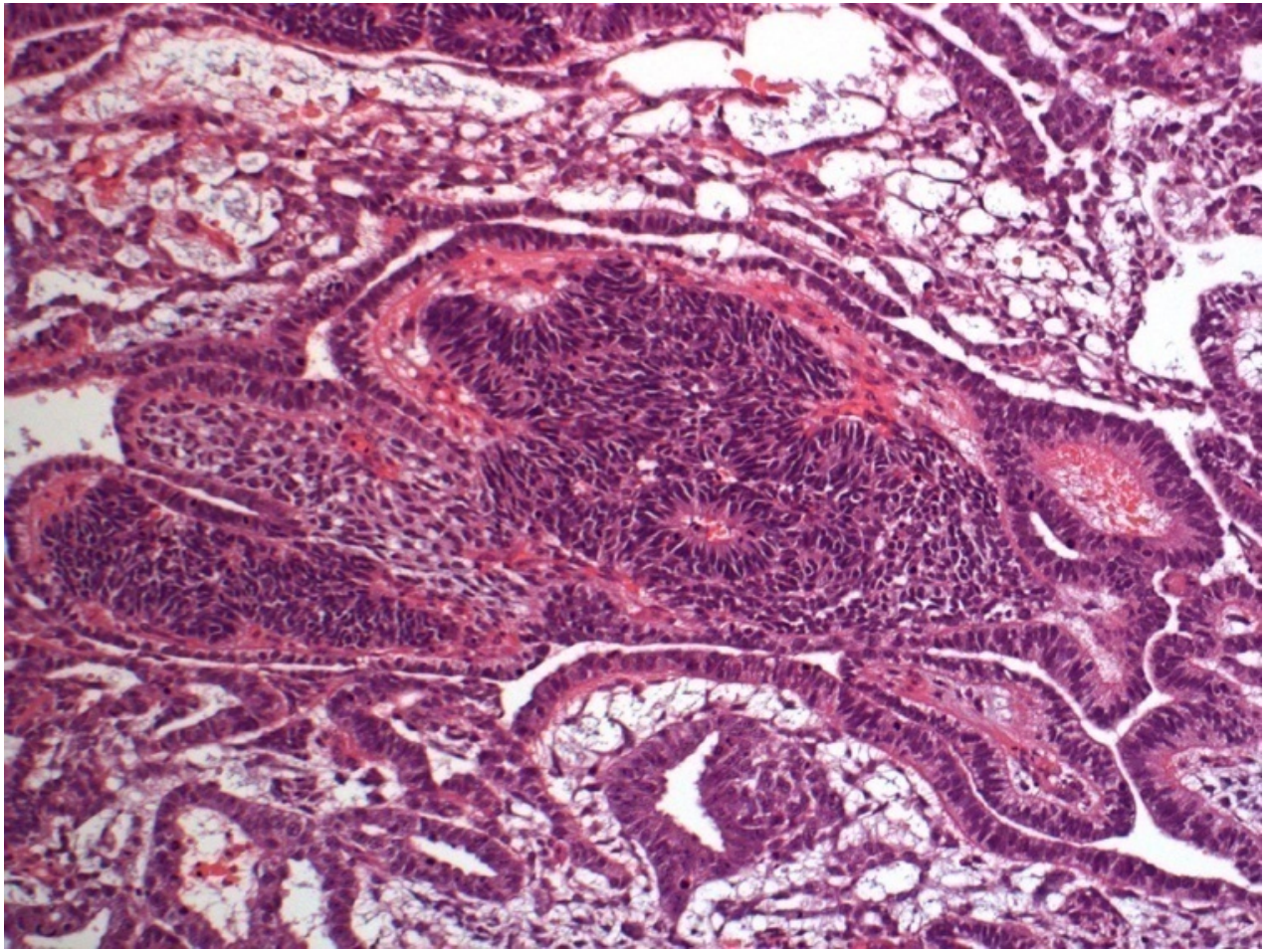

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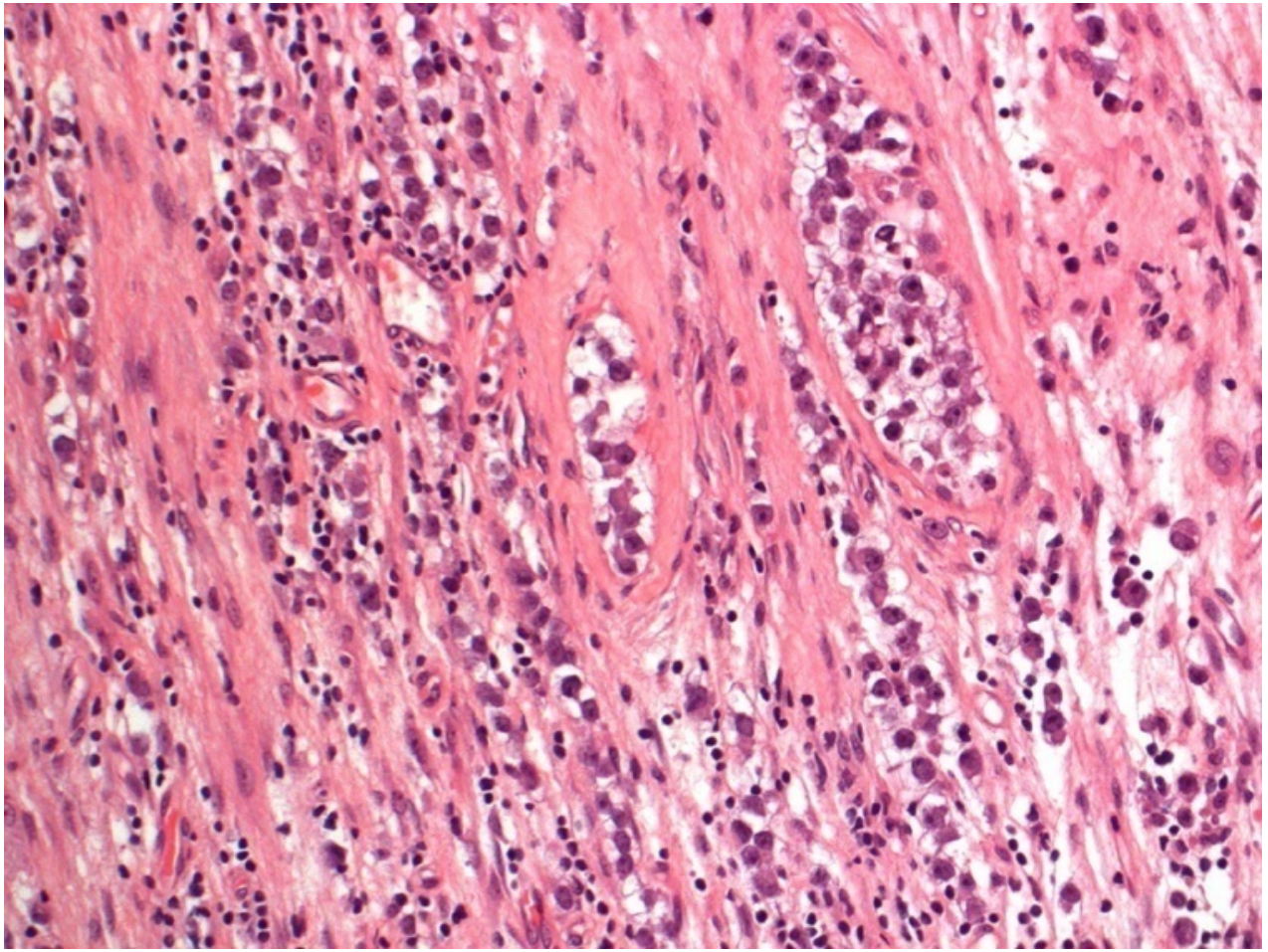


T15

Mixed germ cell tumour

- Embryonal carcinoma
- Yolk sac tumour
- Teratoma
  - Immature neural epithelium (not overgrowth)
- Seminoma

T54

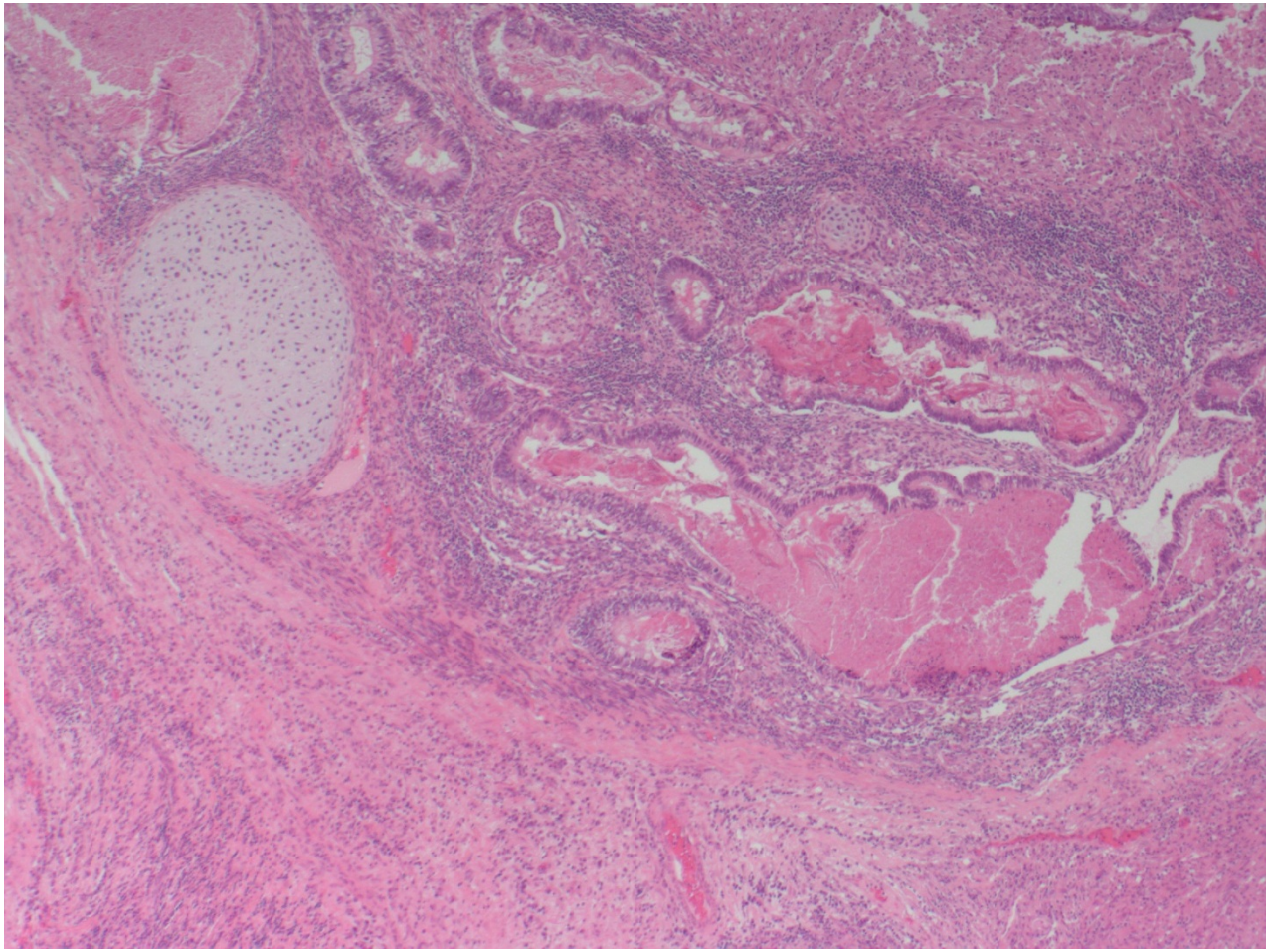
Male, 39 years

Mass in testis

Raised HCG and AFP

Orchidectomy

T54



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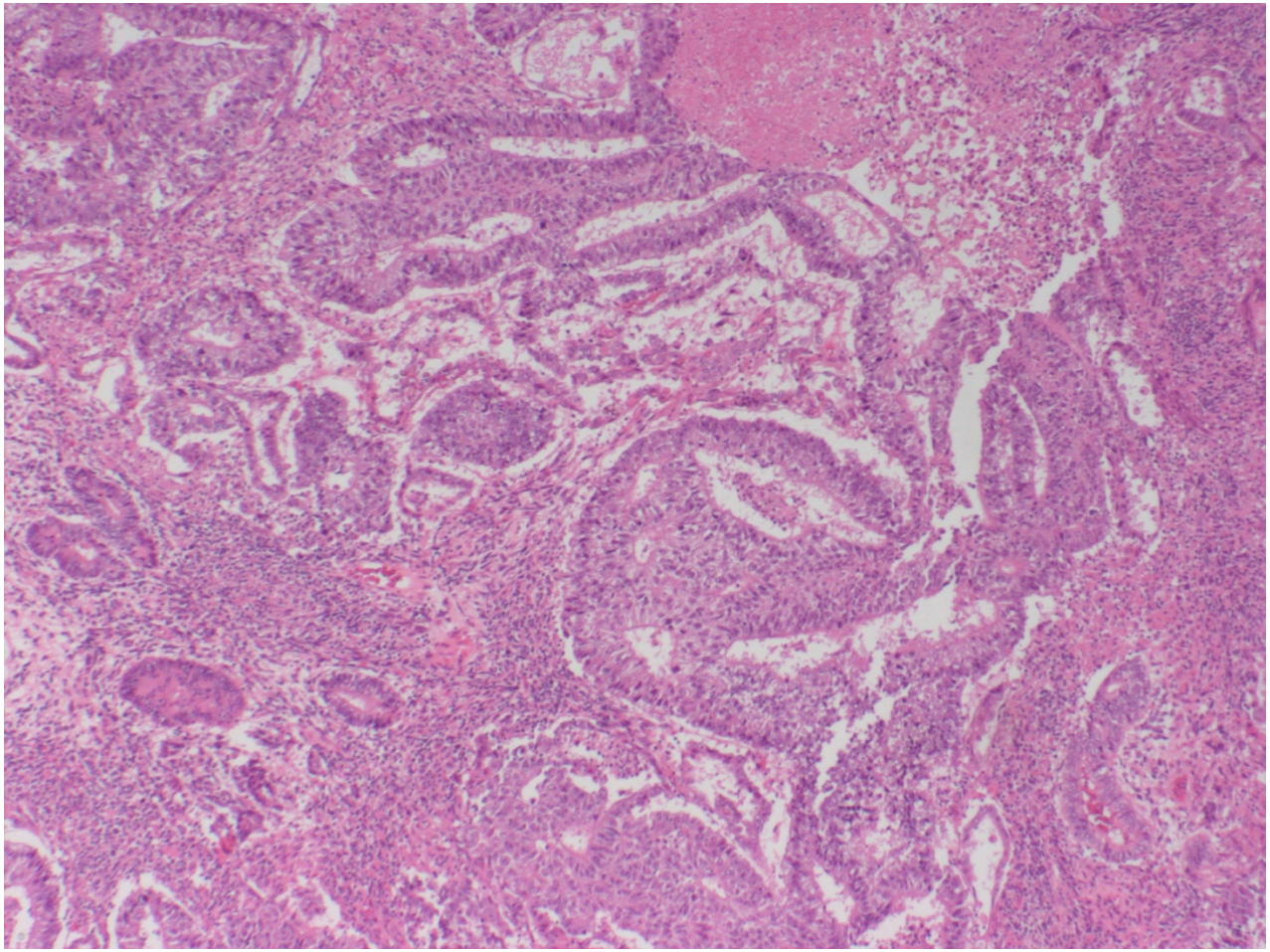

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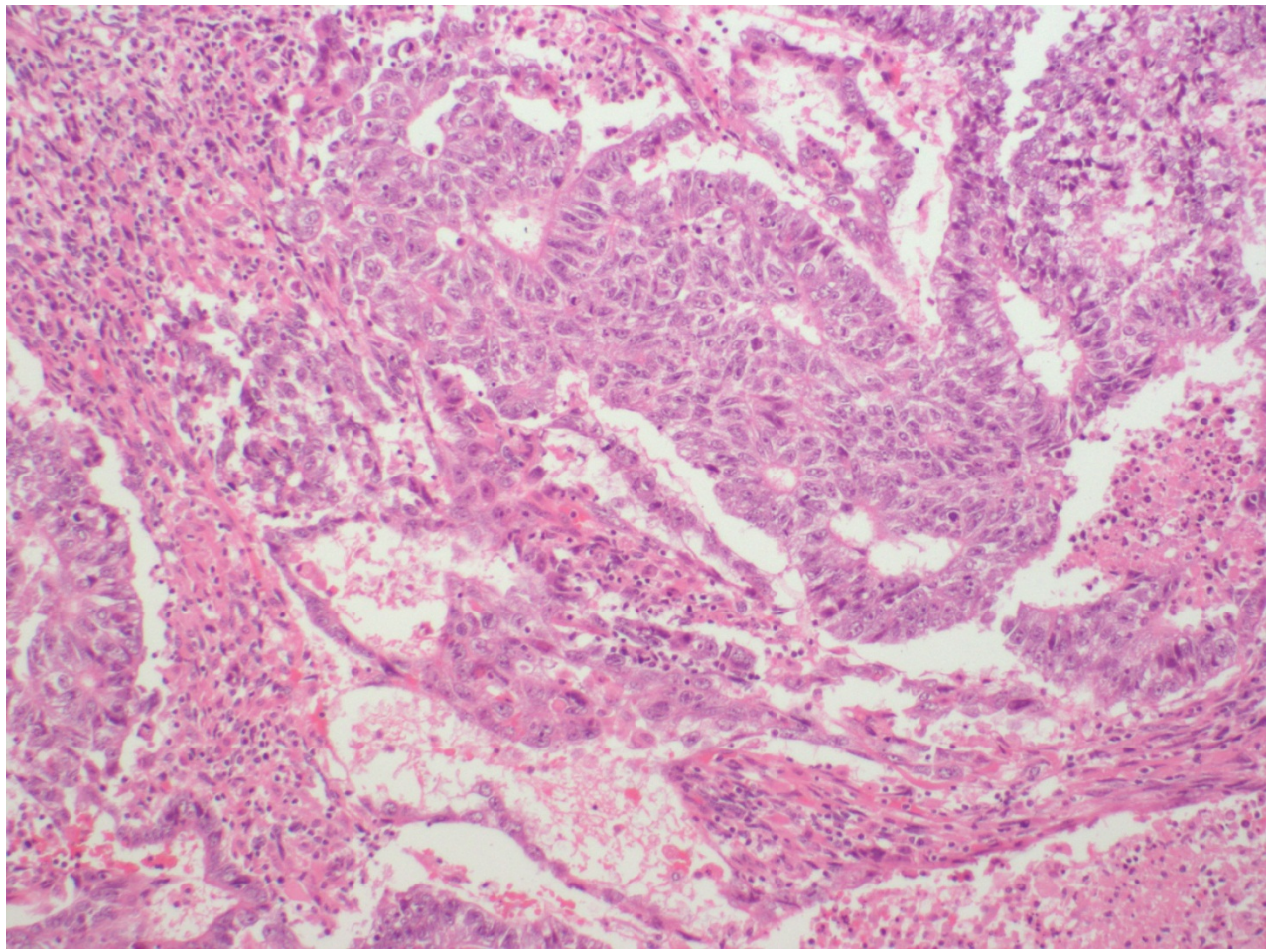
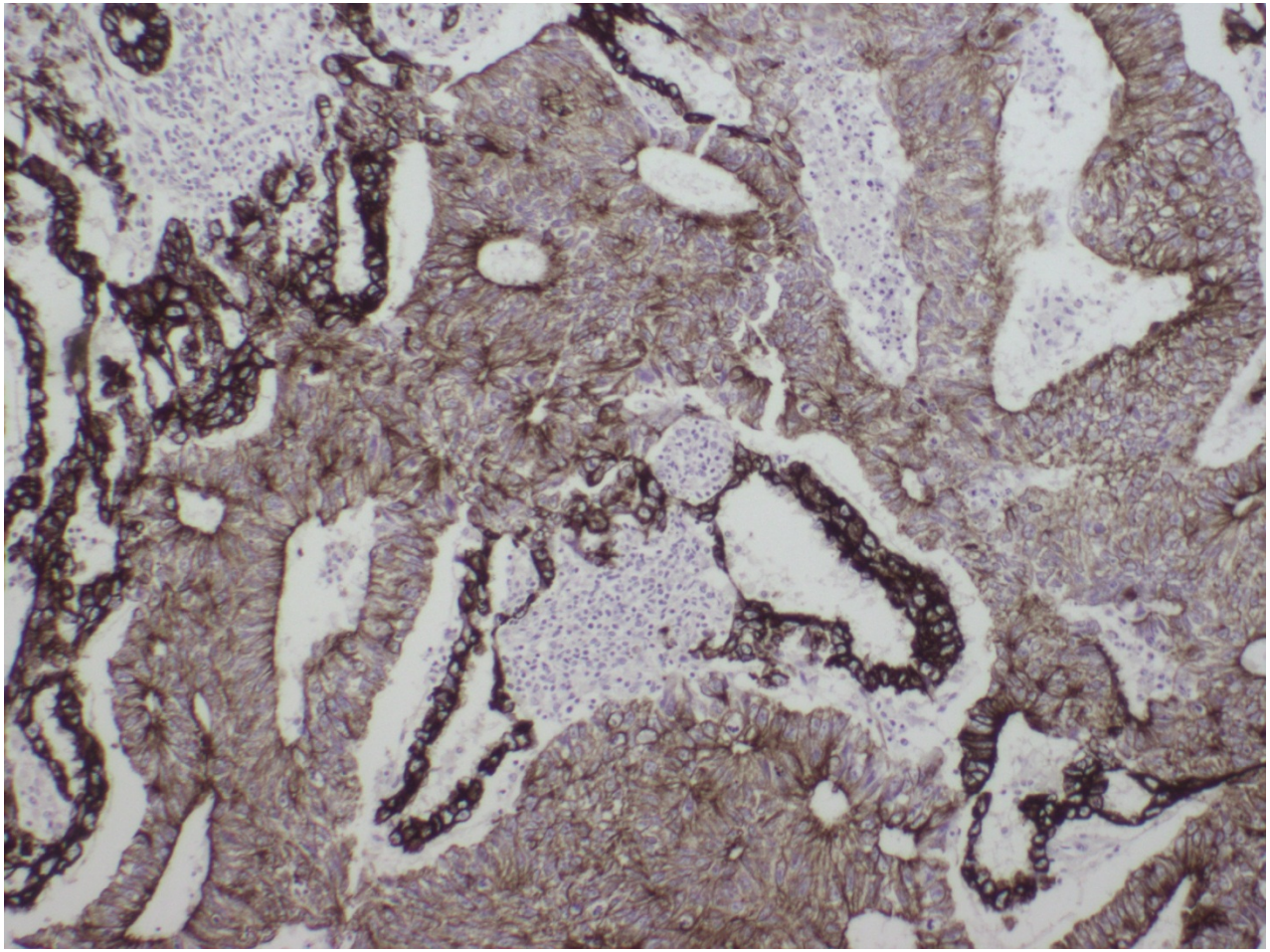


T54 - CK



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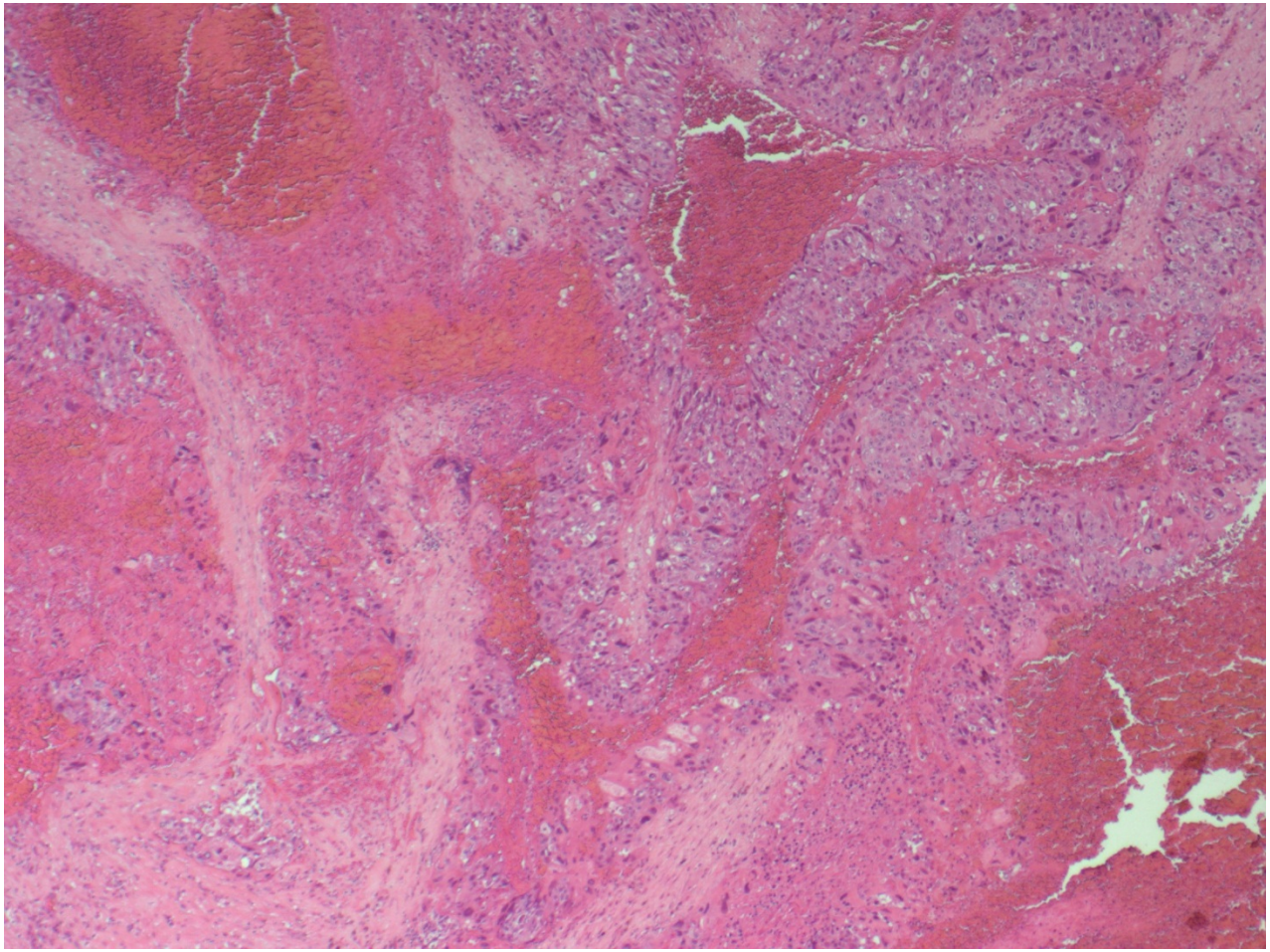

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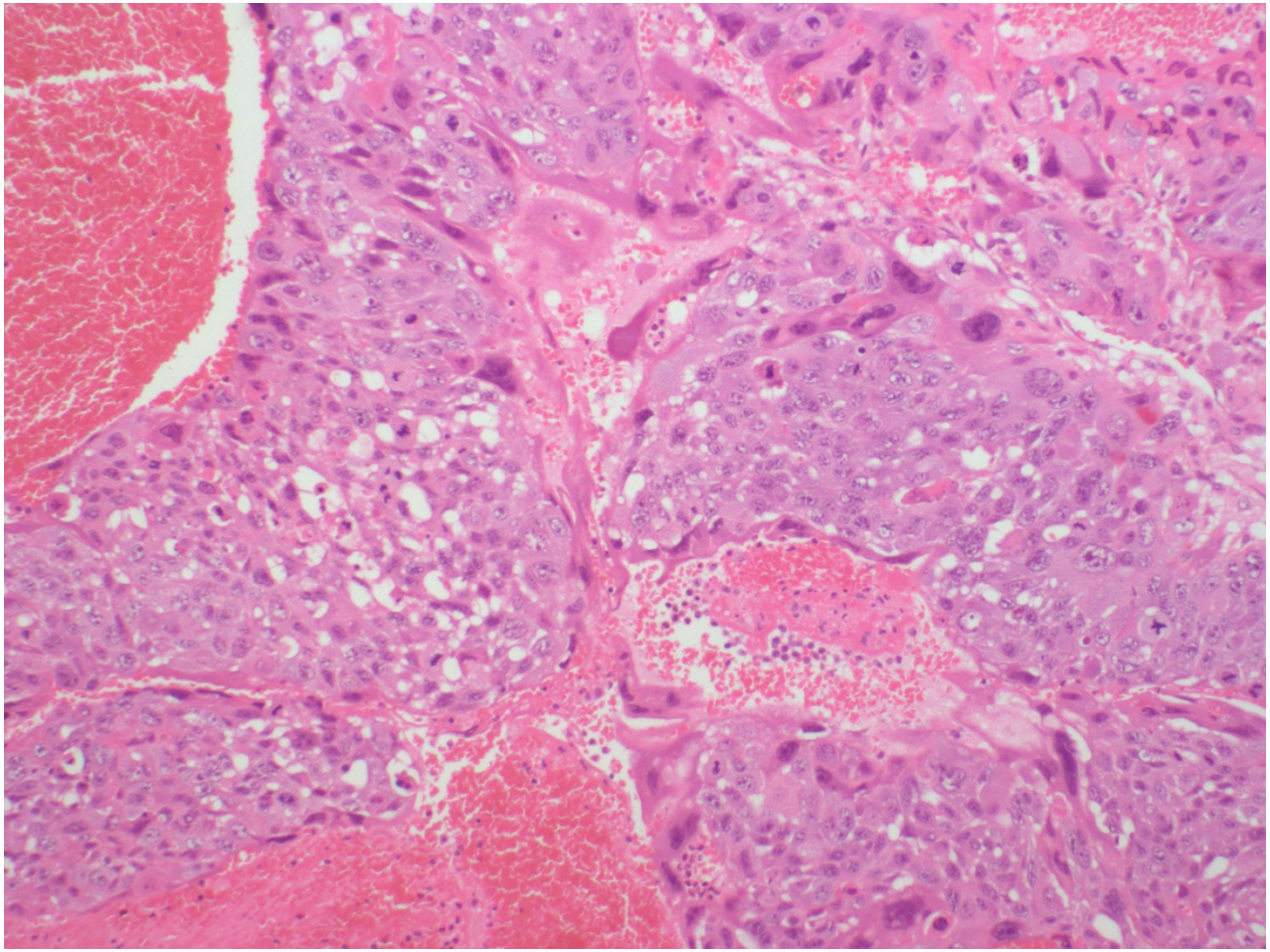

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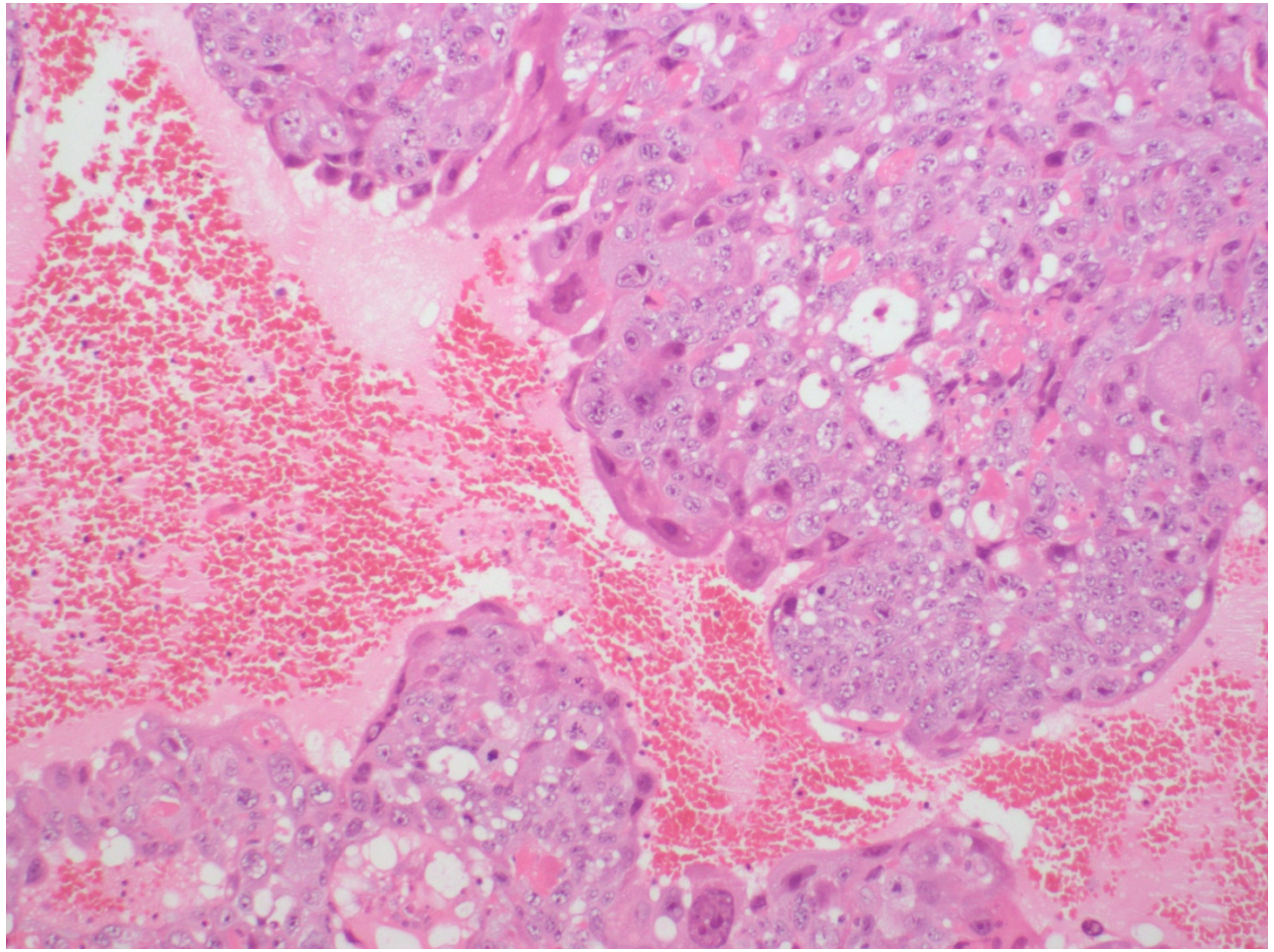


T54

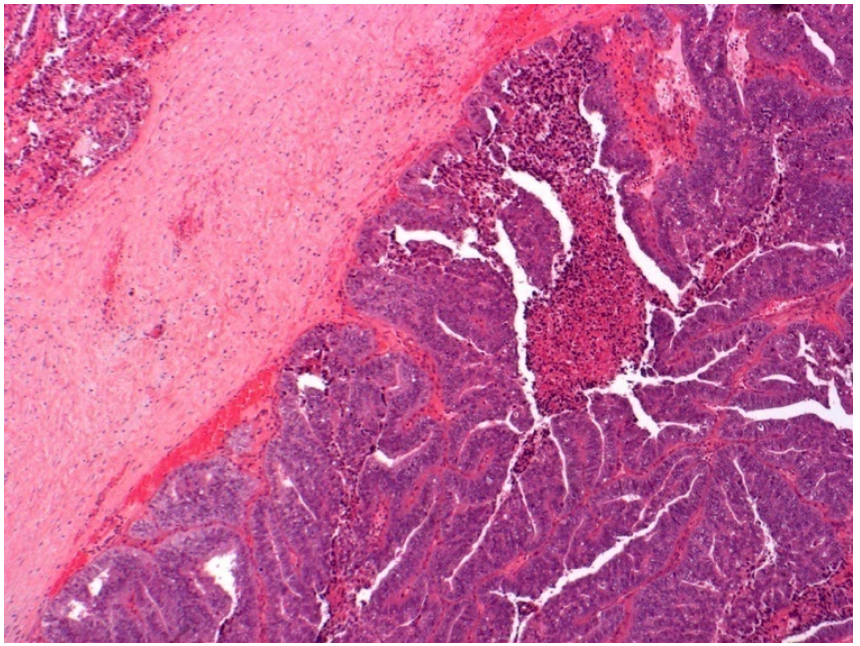
Mixed germ cell tumour

Teratoma
YST
Embryonal carcinoma
Choriocarcinoma

T14

- Male 49 yrs
- Previous germ cell tumour of testis
- RPLND

- Section of Paracaval lymph node



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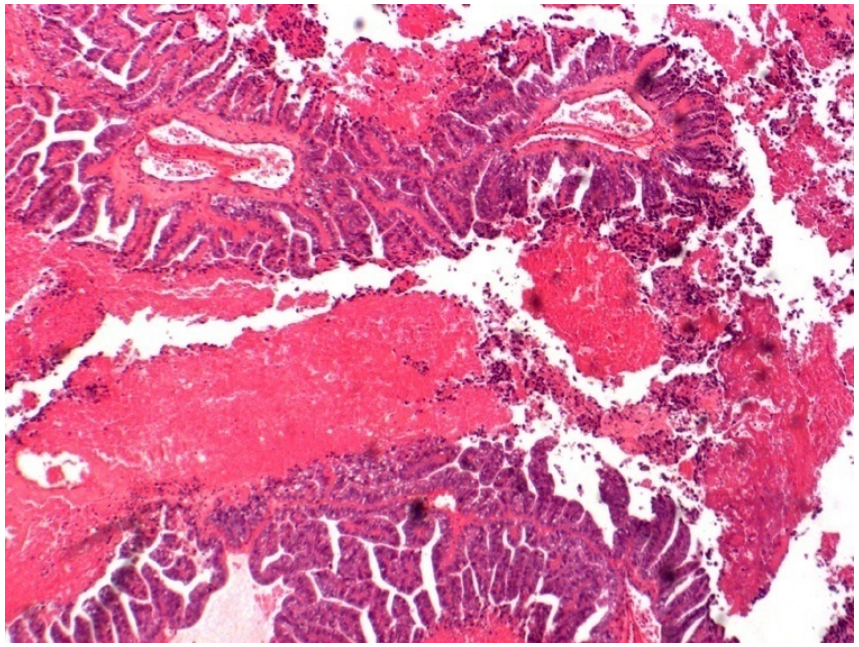

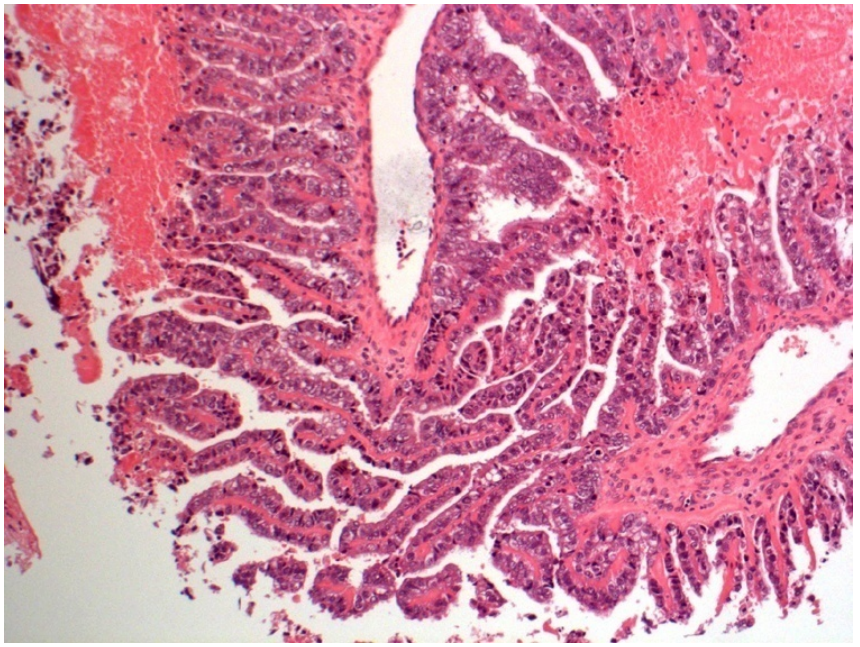

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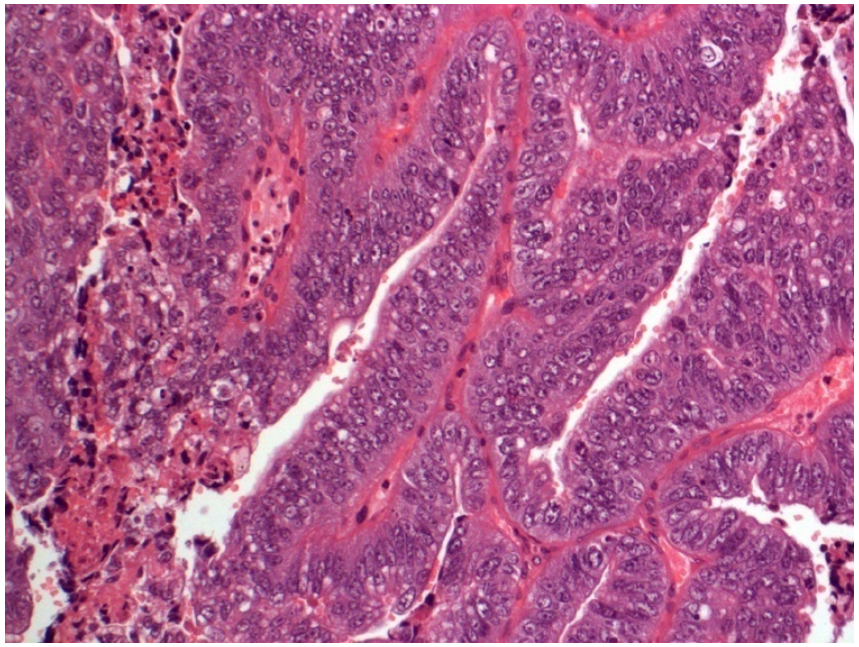
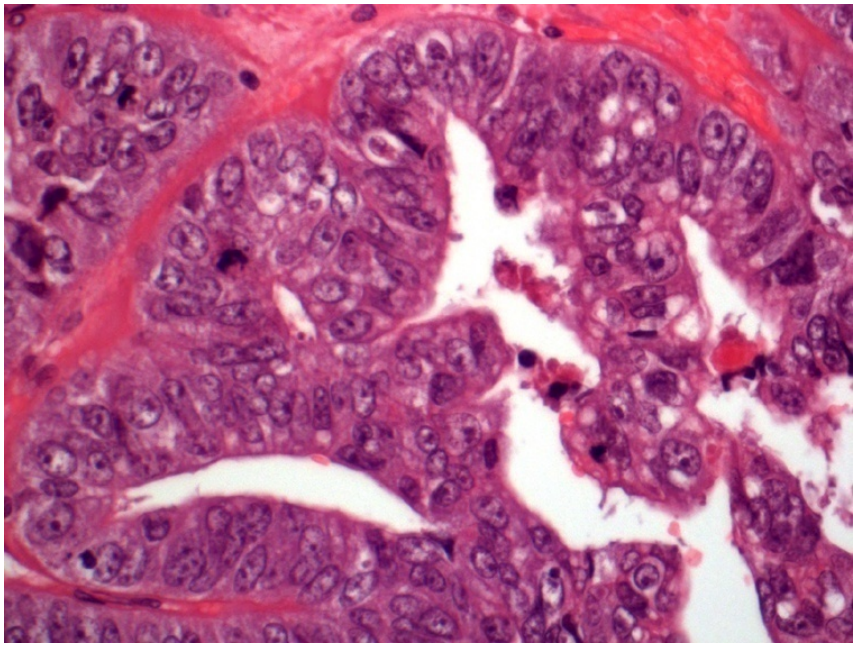
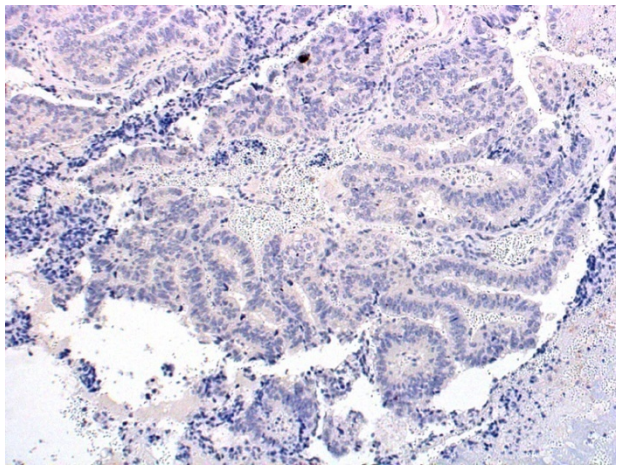
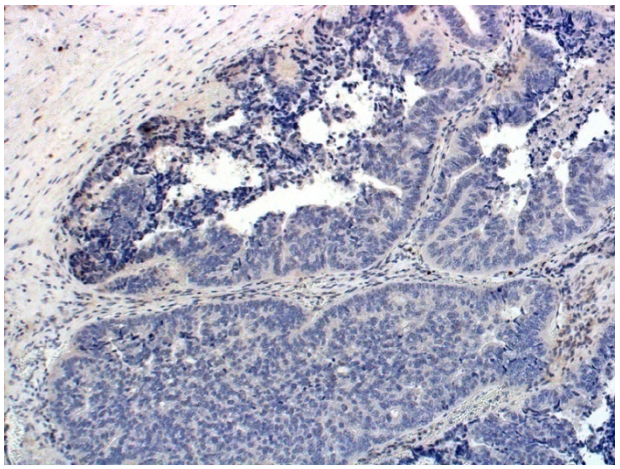
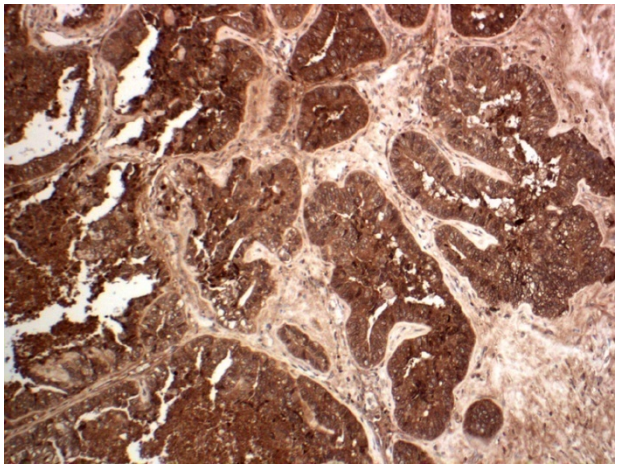




T14
OCT34- CD30- AFP+







T14

Metastatic yolk sac tumour

- Glandular pattern seen in late relapse cases
- Poor outcome

DD

- Embryonal carcinoma
- Metastatic carcinoma
- Somatic transformation

WHO 2016 Germ cell tumour classification

Related to GCNIS (pure or mixed)

- Seminoma
  - With syncytiotrophoblastic cells
- Embryonal carcinoma
- Yolk sac tumour
- Trophoblastic tumours
- Teratoma post-pubertal
  - Teratoma with somatic type malignancies

• Unrelated to GCNIS

- Spermatocytic tumour
- Teratoma pre-pubertal
  - Dermoid cyst, epidermal cyst
  - Monodermal teratoma

Testis tumour - staging

TNM 8

pTis – GCNIS

pT1 - Confined to testis, no LVI

pT2 - Confined to testis with LVI or spread through tunica albuginea to involve tunica vaginalis or hilar soft tissue invasion

pT3 - Spermatic cord invasion +/- LVI

pT4 - Scrotal invasion +/- LVI

- LVI = lymphovascular invasion

Key IHC

	PLAP	OCT3/4	CD30	AFP	CD117	EMA	CK	Glyp3
Seminoma	+	+	-	-	+	+/-	+/-	-
Sp Tum	+/-	-	-	-	+	-	+/-	-
Emb. Ca.	+/-	+	+	+/-	-	-	+	-
YST	+	-	-	+	-	-	+	+

SALL4 = Germ cell marker

Testicular tumours – summary 1

Consider clinical details

- Age (sp.sem, NHL, metastasis in older)
- Serum markers

Histology

- Primary or metastasis?
- Germ cell or non-germ cell?
- Enough blocks to show heterogeneity

List components in mixed GCT (WHO classification)

- with % (amount of embryonal carcinoma important – high % poorer prognosis)
- Low threshold for IHC in unusual patterns

Testicular tumours – summary 2

TNM Staging

- Vascular invasion moves pT1 to pT2 – do not overcall ‘smearing’ of tumour especially with seminoma
- pT1 seminoma – add tumour size and rete (interstitial) involvement

Lymph node metastasis, unknown primary, young male – think GCT

- Remember yolk sac tumour is OCT 3/4 negative
- Yolk sac tumour, embryonal carcinoma, seminoma may mimic each other – and carcinoma
- Metastatic yolk sac tumour shows unusual patterns

Testicular tumours – summary 3

RPLND

- Margins important as surgery is key to cure
- Germ cell tumour metastases may not respond well to usual GCT chemotherapy

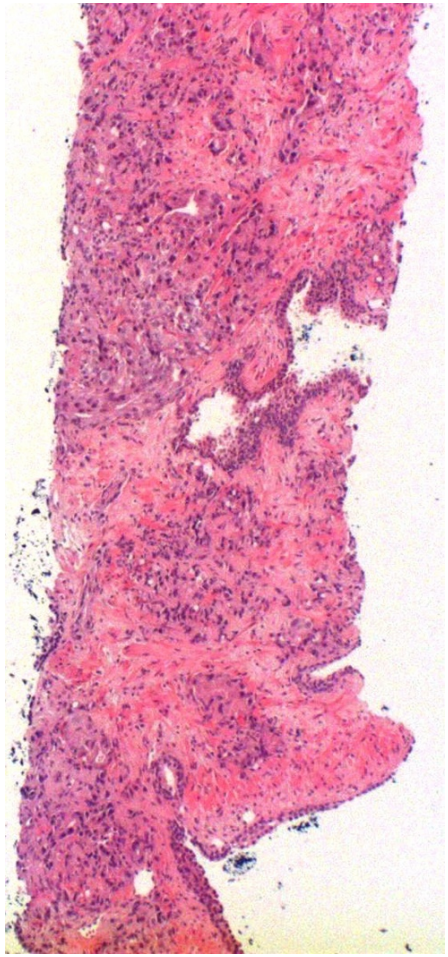
Somatic malignancy arising in GCT

- usually in teratomatous component - 'overgrowth'
  - PNET
  - Rhabodmyosarcoma
  - Carcinoma

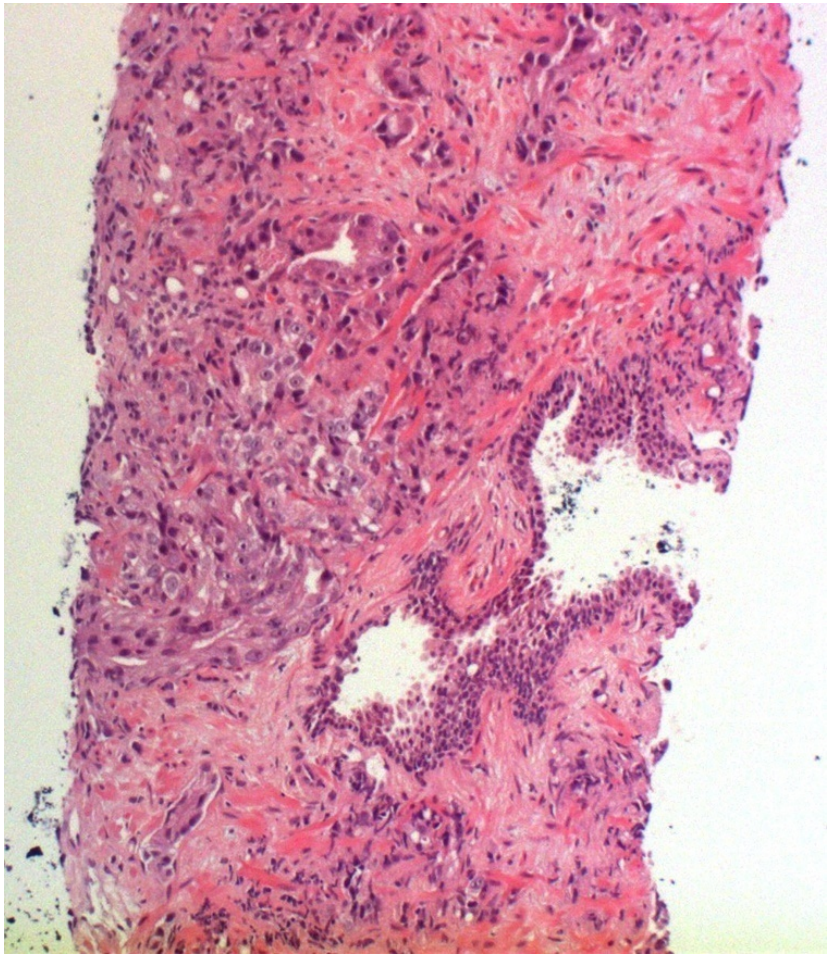
Prostate

P1

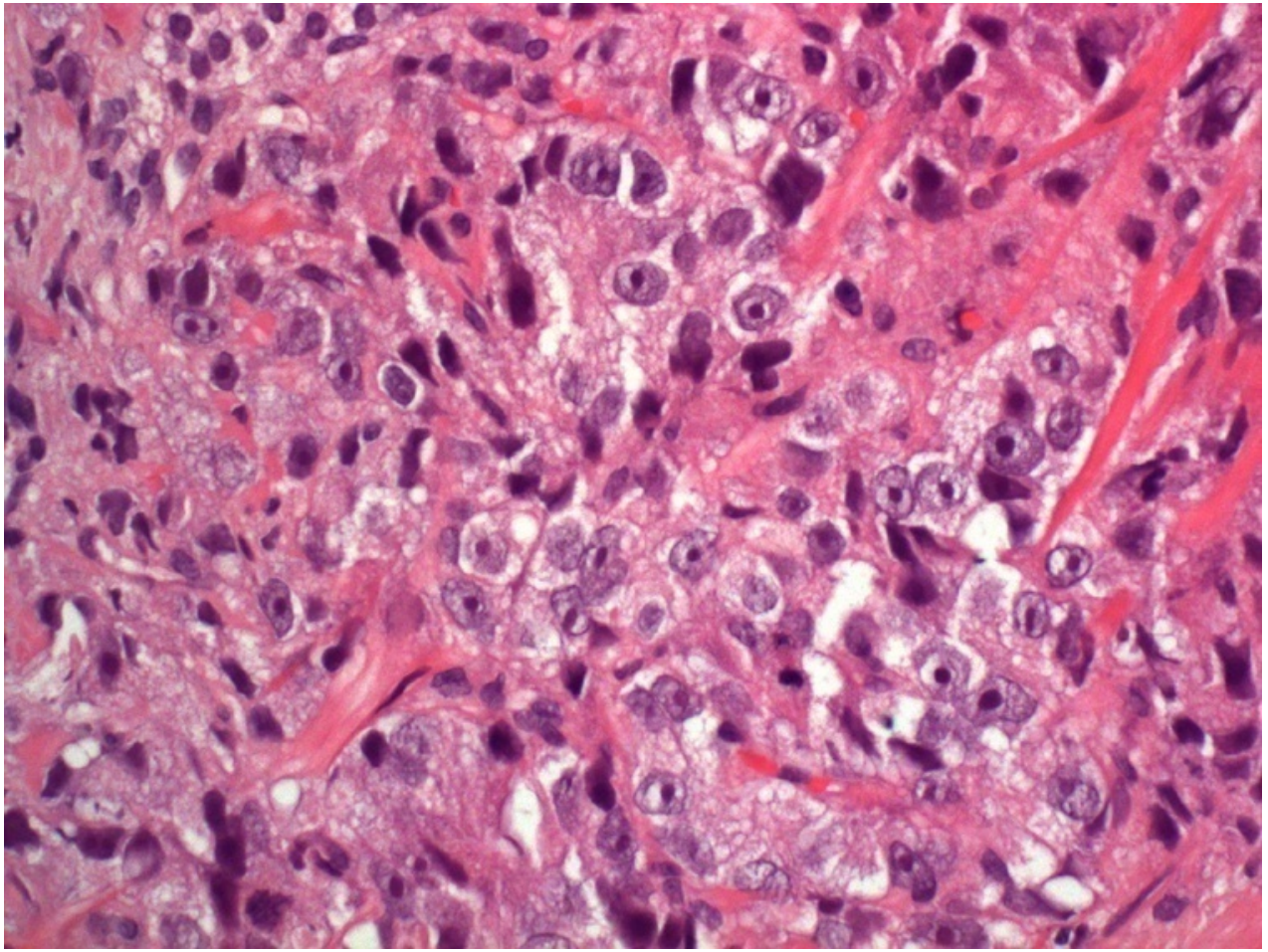
- Male 81 yrs
- DRE large firm prostate



P1



P1



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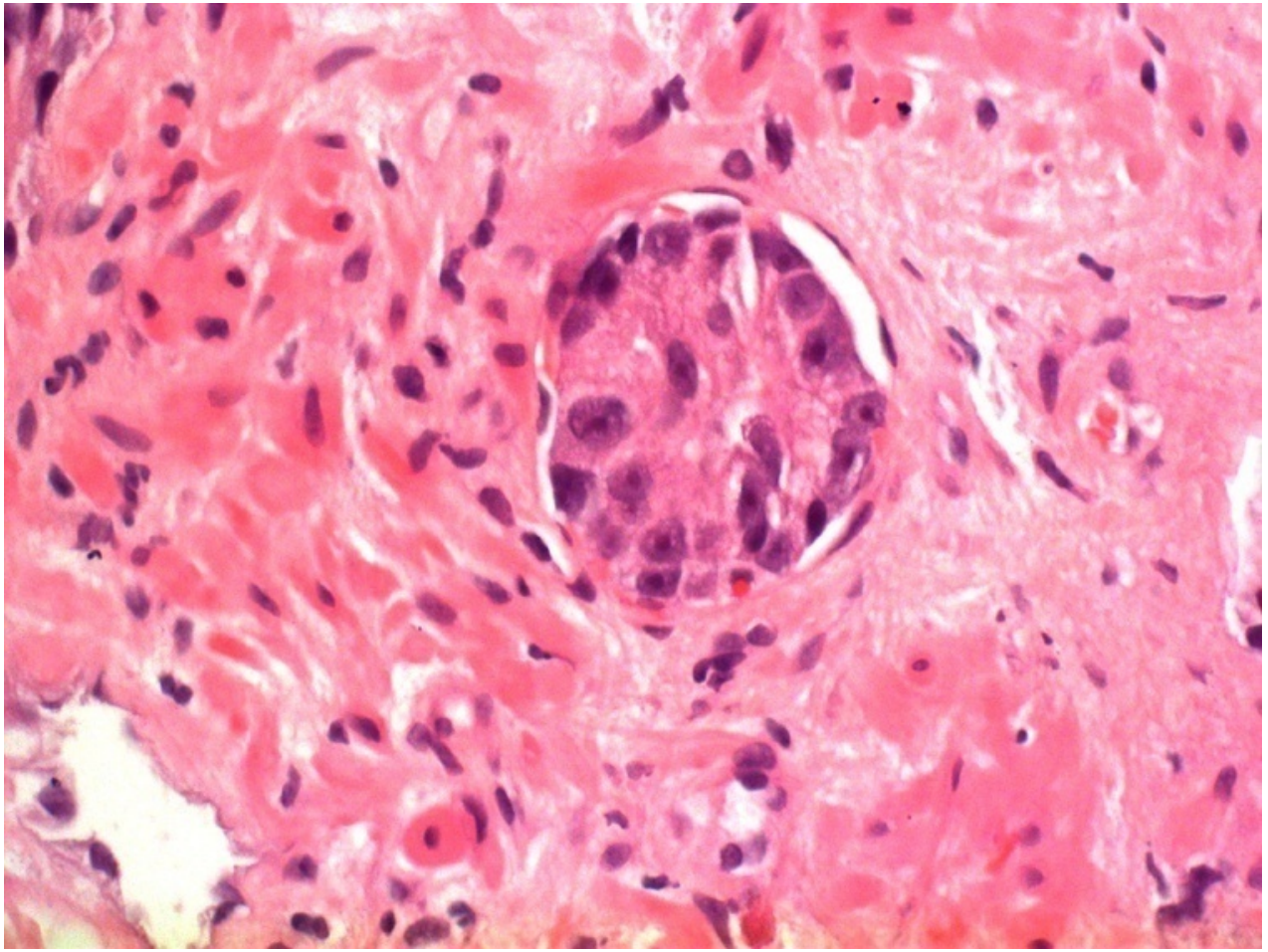


P1

Prostatic adenocarcinoma with lymphovascular invasion

- Gleason score 5+5=10 / Grade Group 5
- Note eosinophilic nucleoli in prostate cancer
- Consider urothelial carcinoma if pleomorphic

  Prostate: PSA+ PSAP+ AMACR + NKX3.1+ Prostein+
  CK7- 34BE12- p63- GATA3-

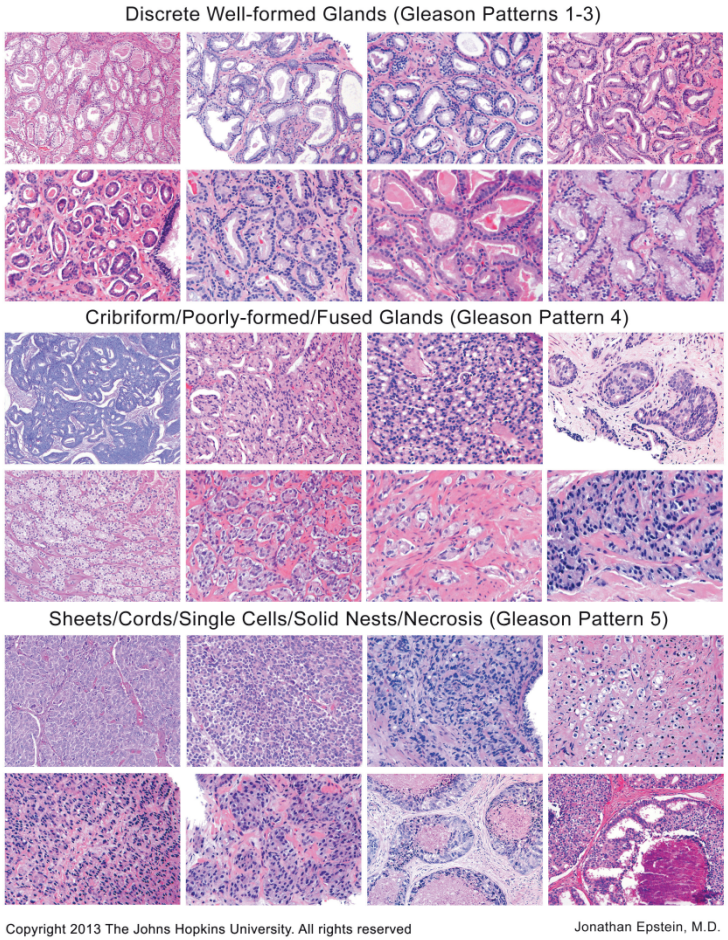
  Urothelial: converse

2014 International Society of Urological Pathology (ISUP) Consensus Conference on Gleason Grading of Prostatic Carcinoma

Prognostic Grade Groups 1-5

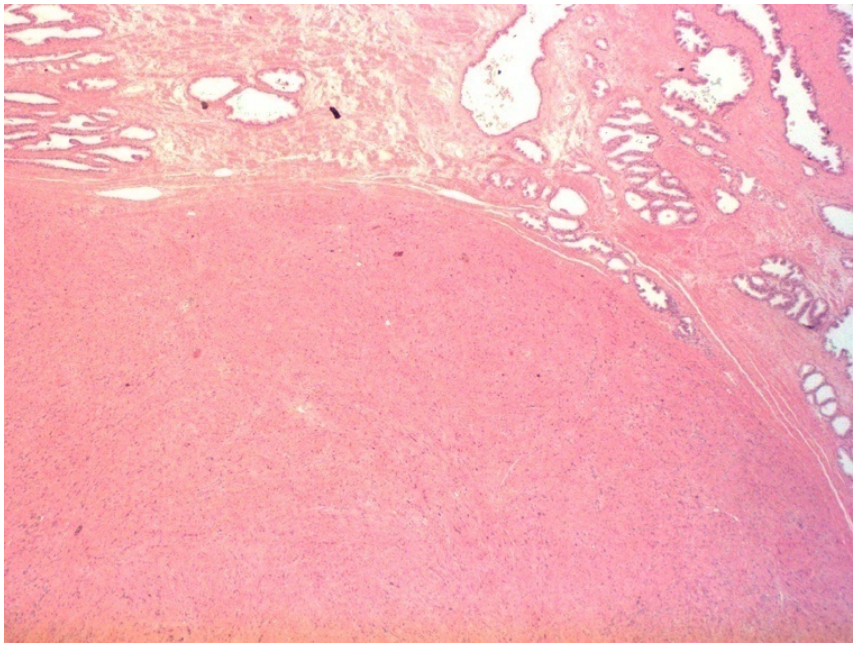
- Grade group I = up to GS 6
- Grade group 2 = GS 3+4
- Grade group 3 = GS 4+3
- Grade group 4 = GS 8
- Grade group 5 = GS 9-10

Epstein JI et al. Eur Urol 2015



P5

- Male 56 yrs
- Cytoprostatectomy and lymphadenectomy for G3 pTa urothelial carcinoma
- Section of prostate



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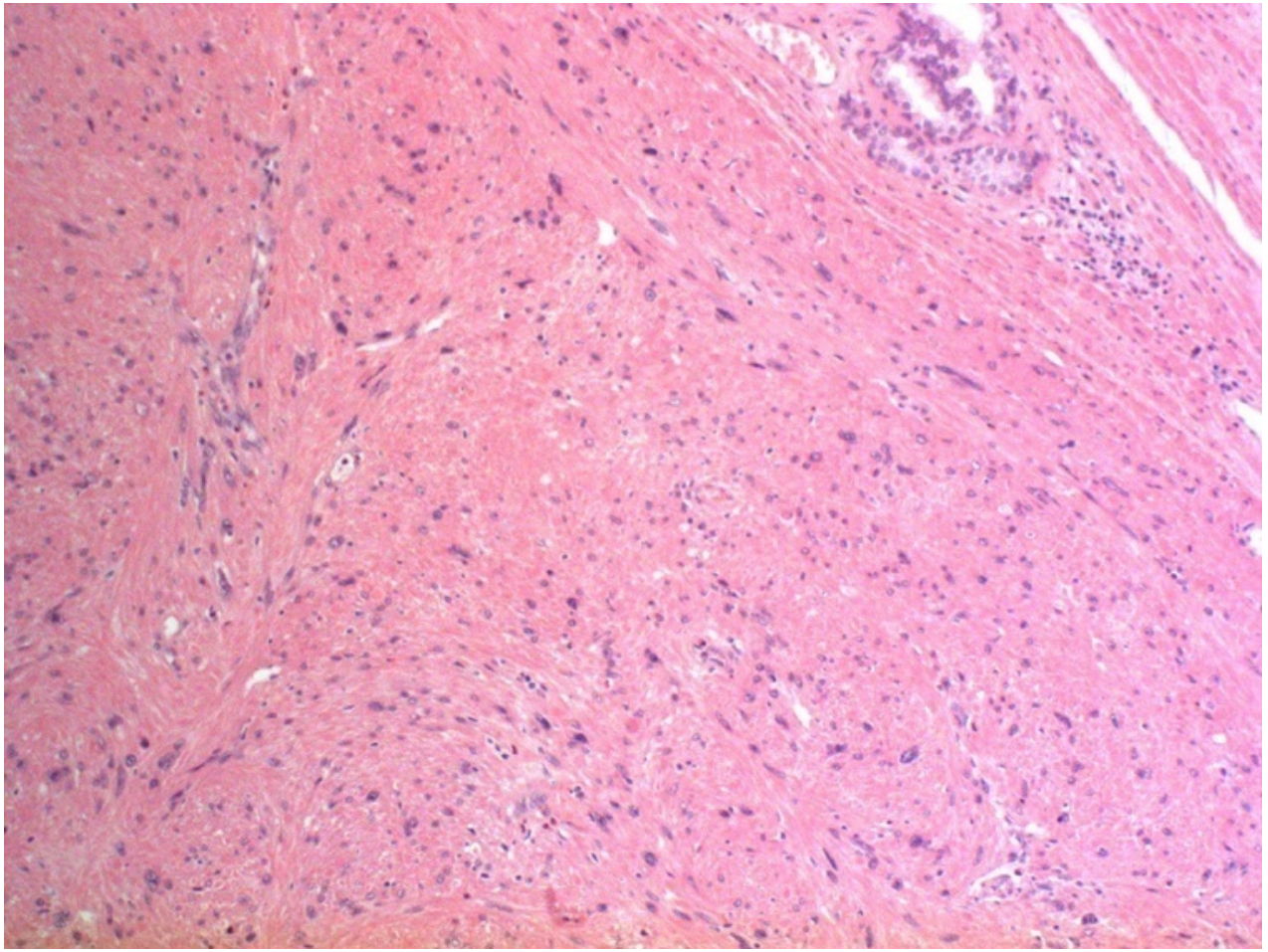

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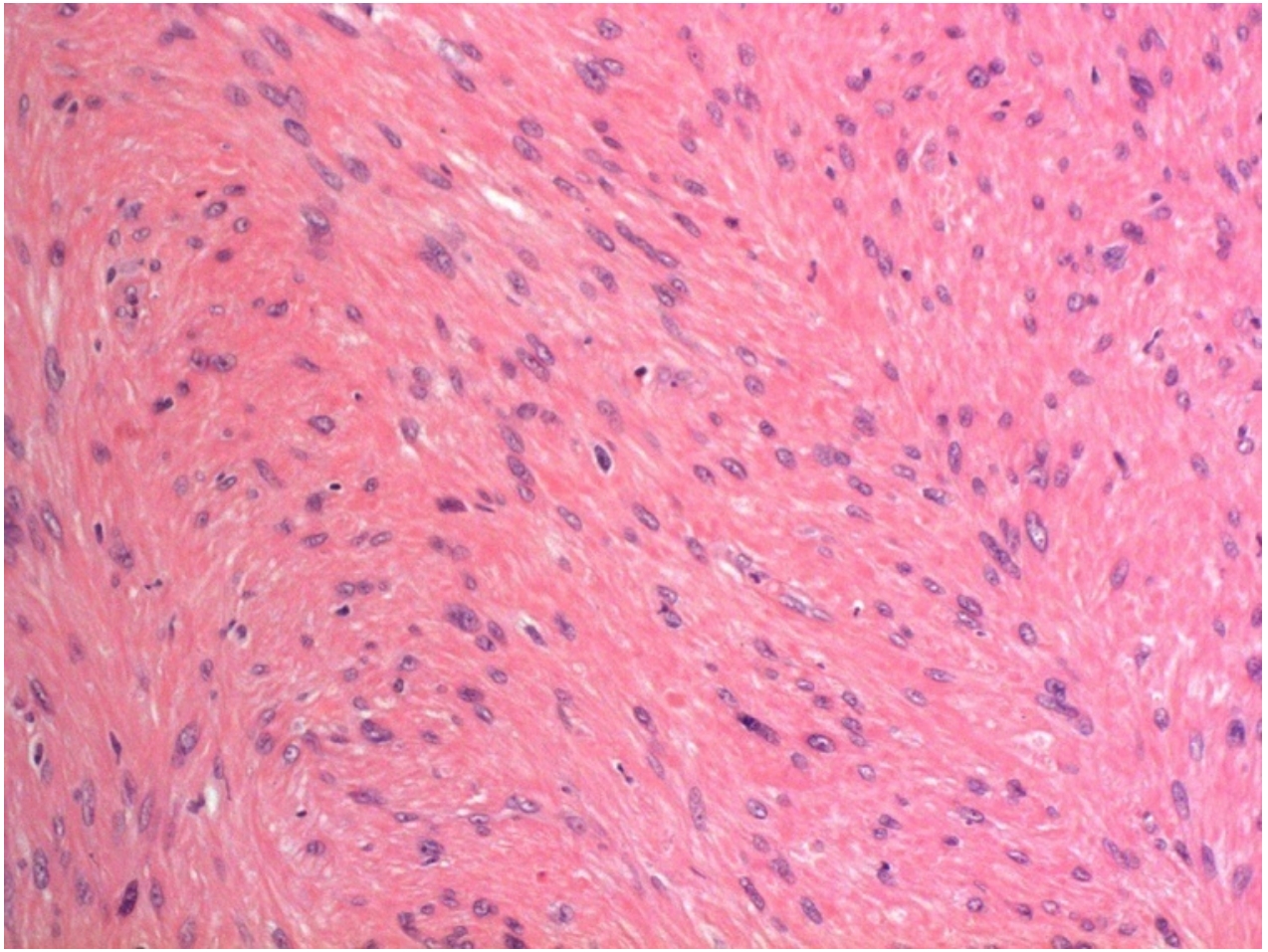

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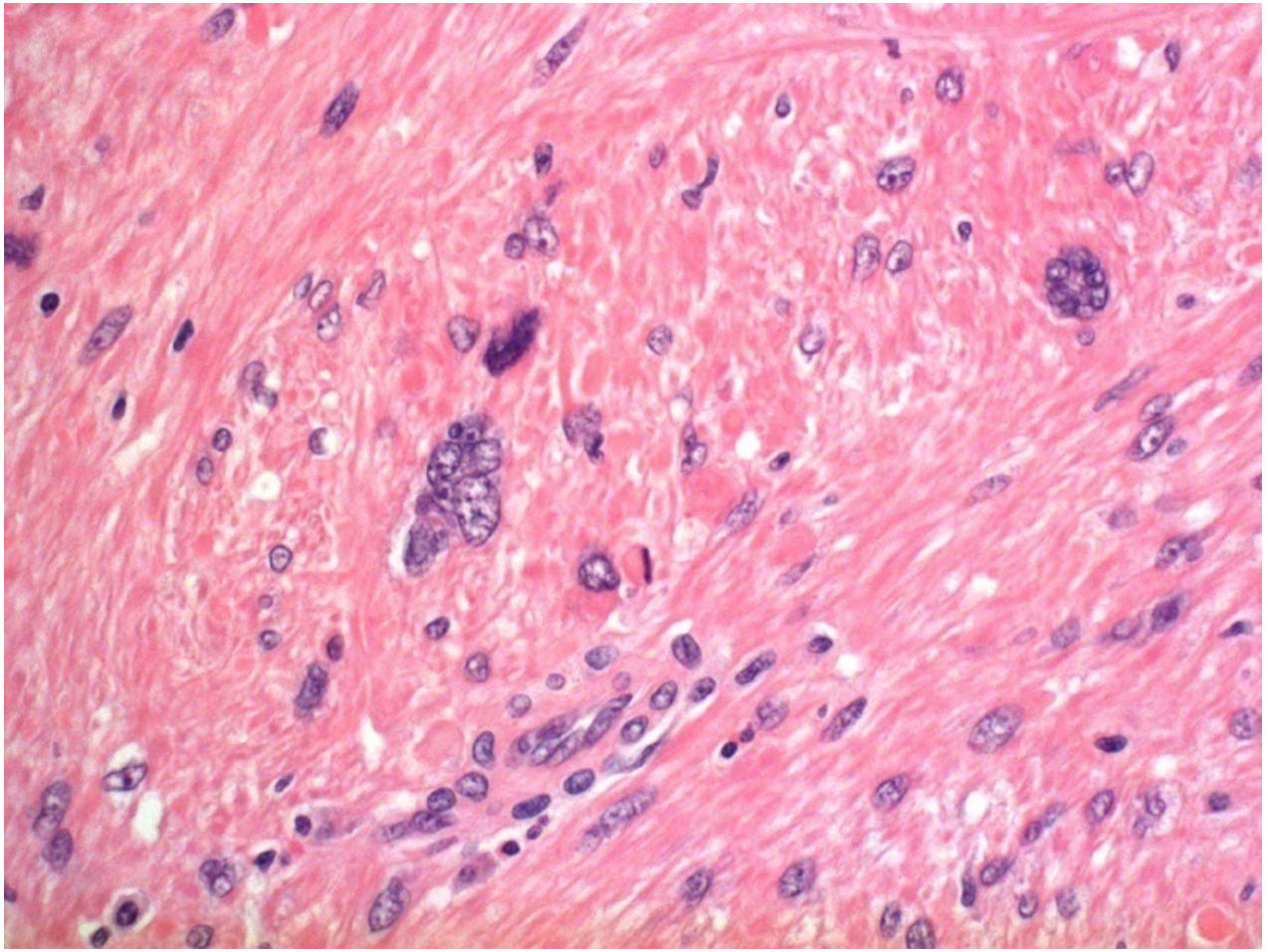


P5

Leiomyoma (symplastic)

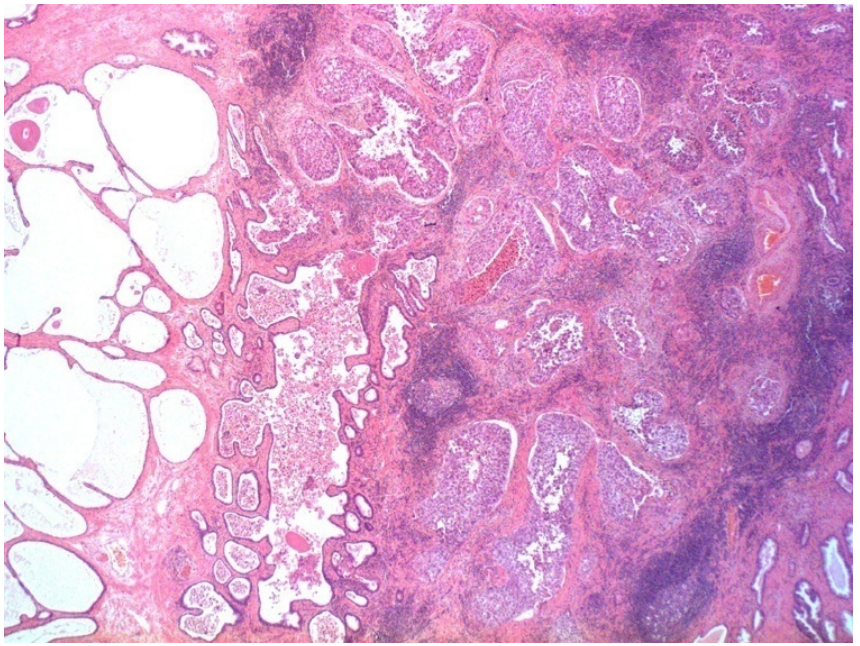
- CD34- Desmin + H-Caldesmon +

DD

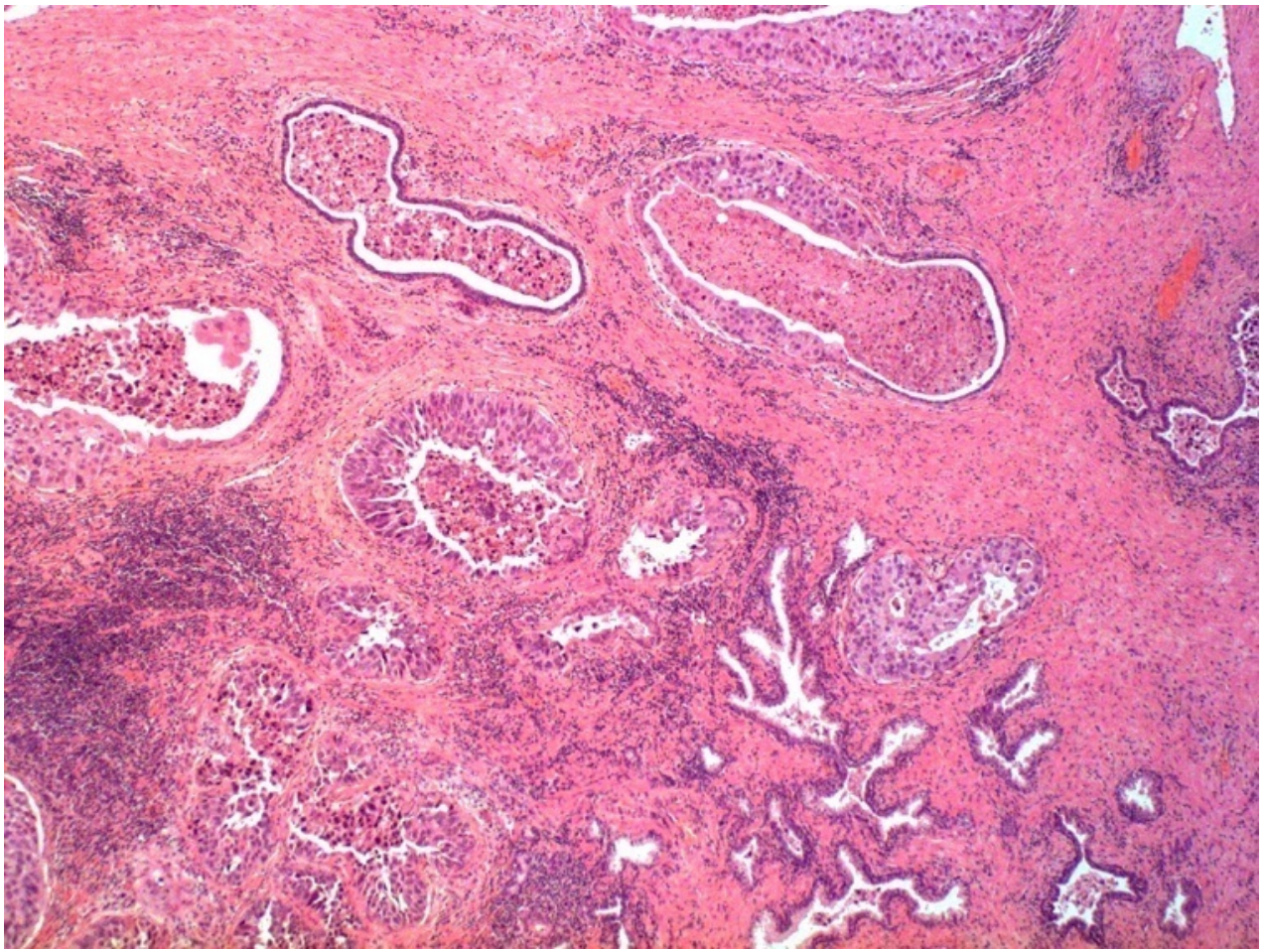
- Hyperplastic stromal nodule (stromal vessels ++)
- Leiomyosarcoma (atypia, necrosis, mitoses)

P8

- Male 70 yrs
- Cystoprostatectomy for urothelial carcinoma
- Section of prostate



P8



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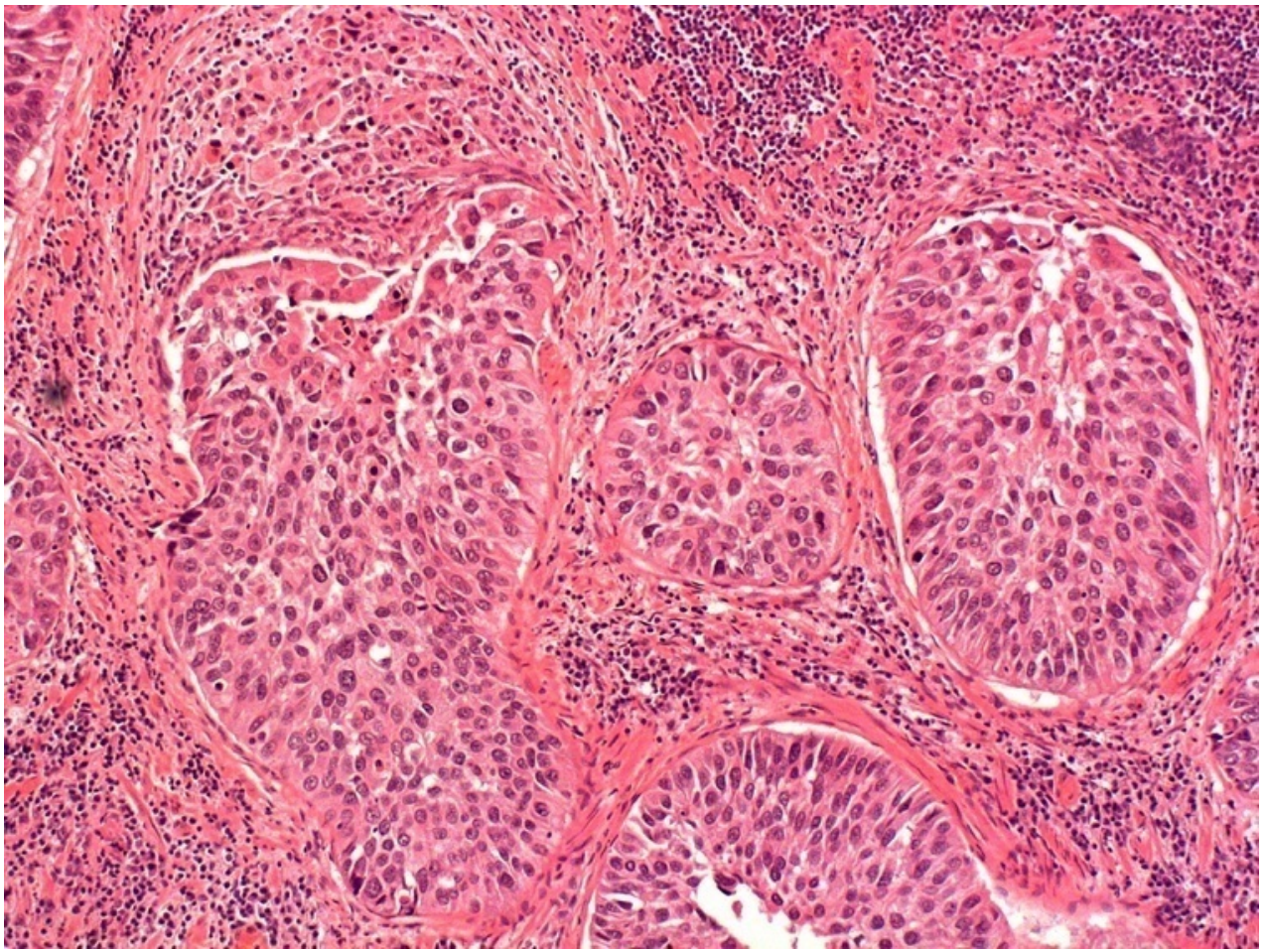

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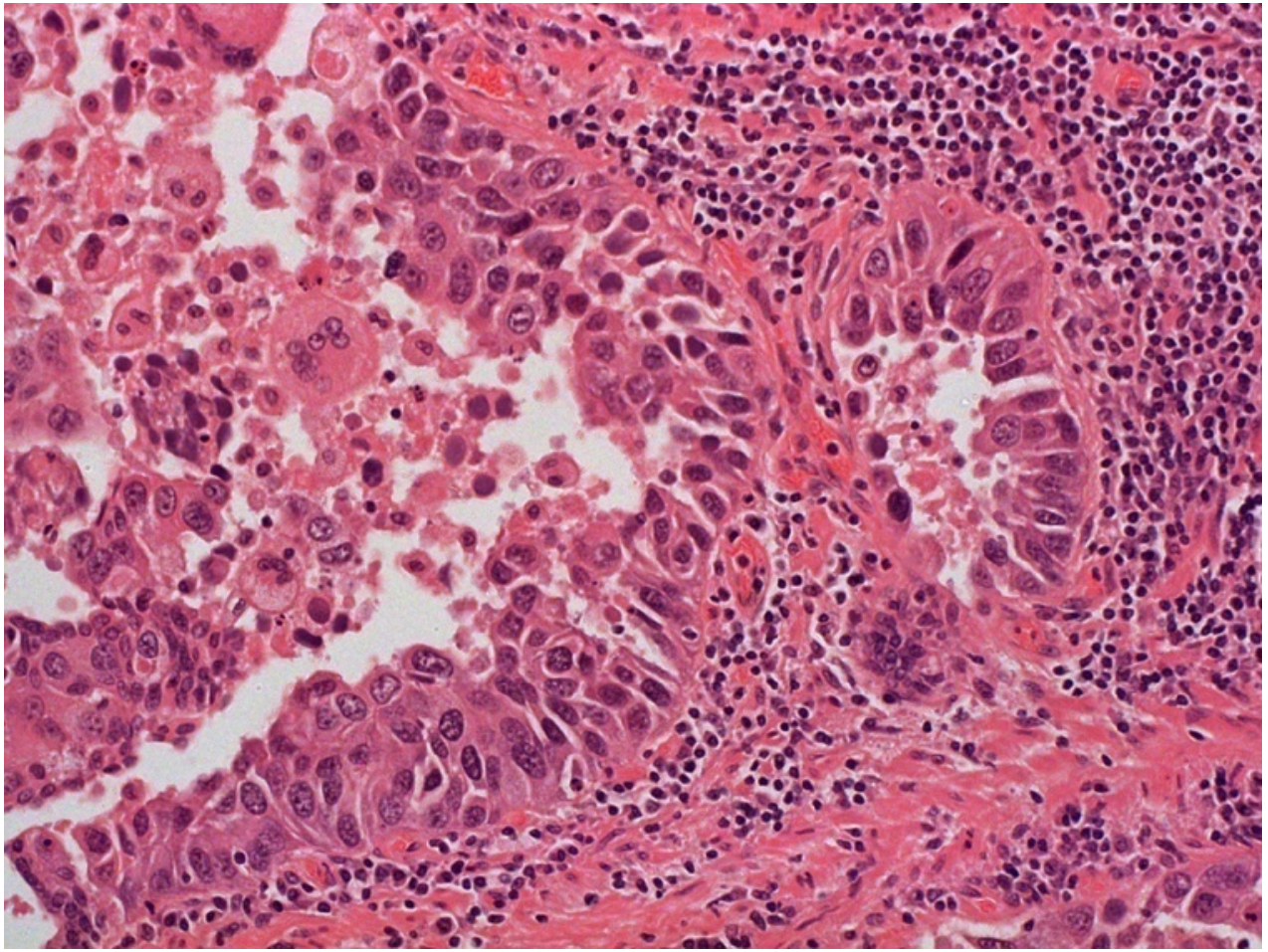
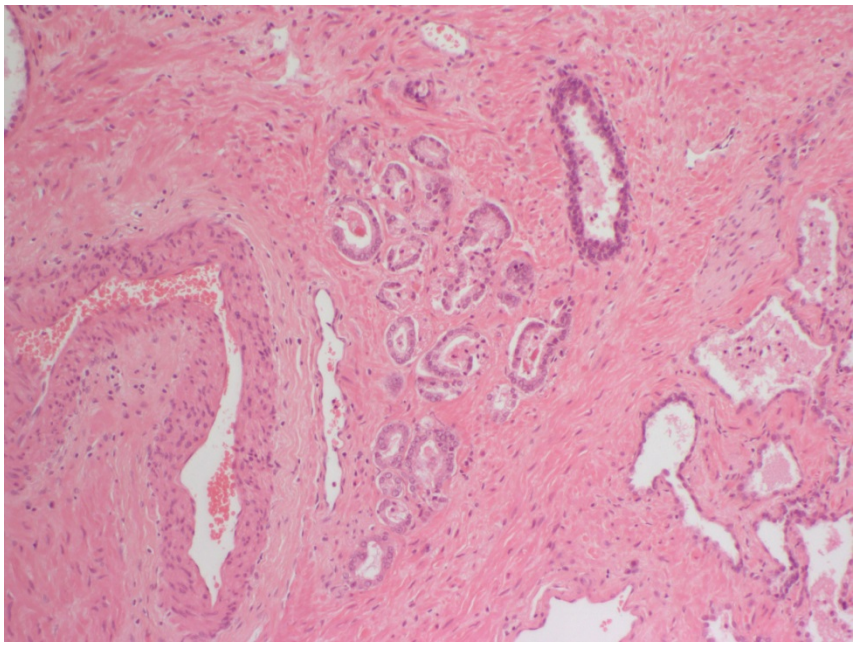


P8

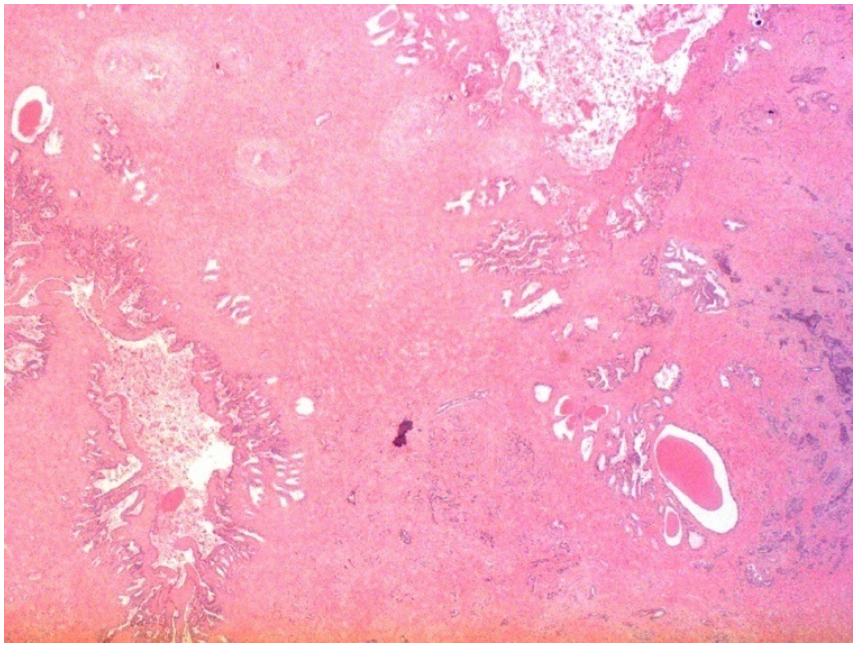
- Urothelial carcinoma extending into prostatic ducts
- Tiny Gleason score 3+3=6 adenocarcinoma
  - Note atypia > than in prostatic adenocarcinoma

DD
- Invasive urothelial carcinoma
- High grade PIN
- Prostatic adenocarcinoma



P9

- Male 53 yrs
- Radical prostatectomy for prostate cancer
- Section of seminal vesicle



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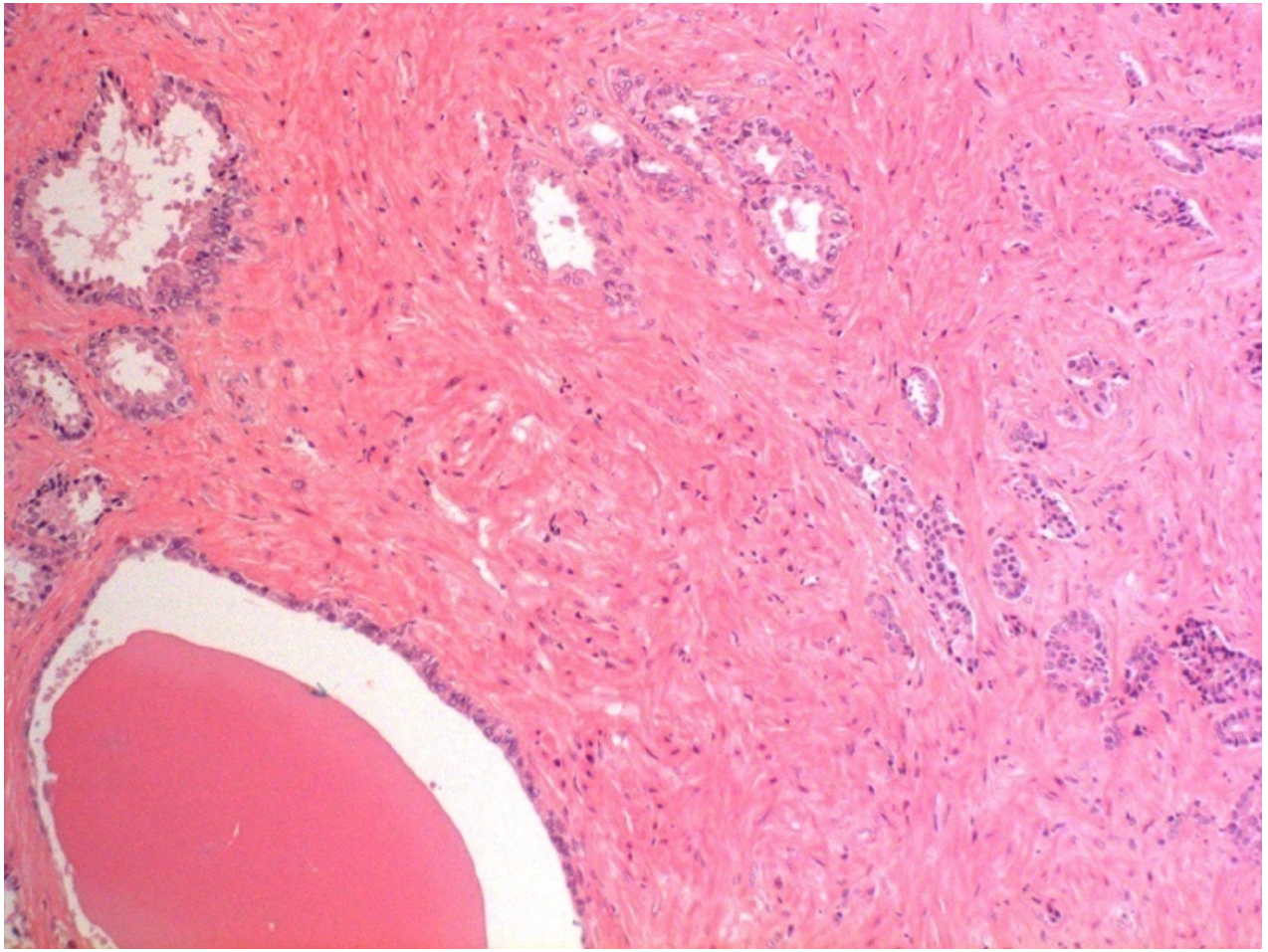

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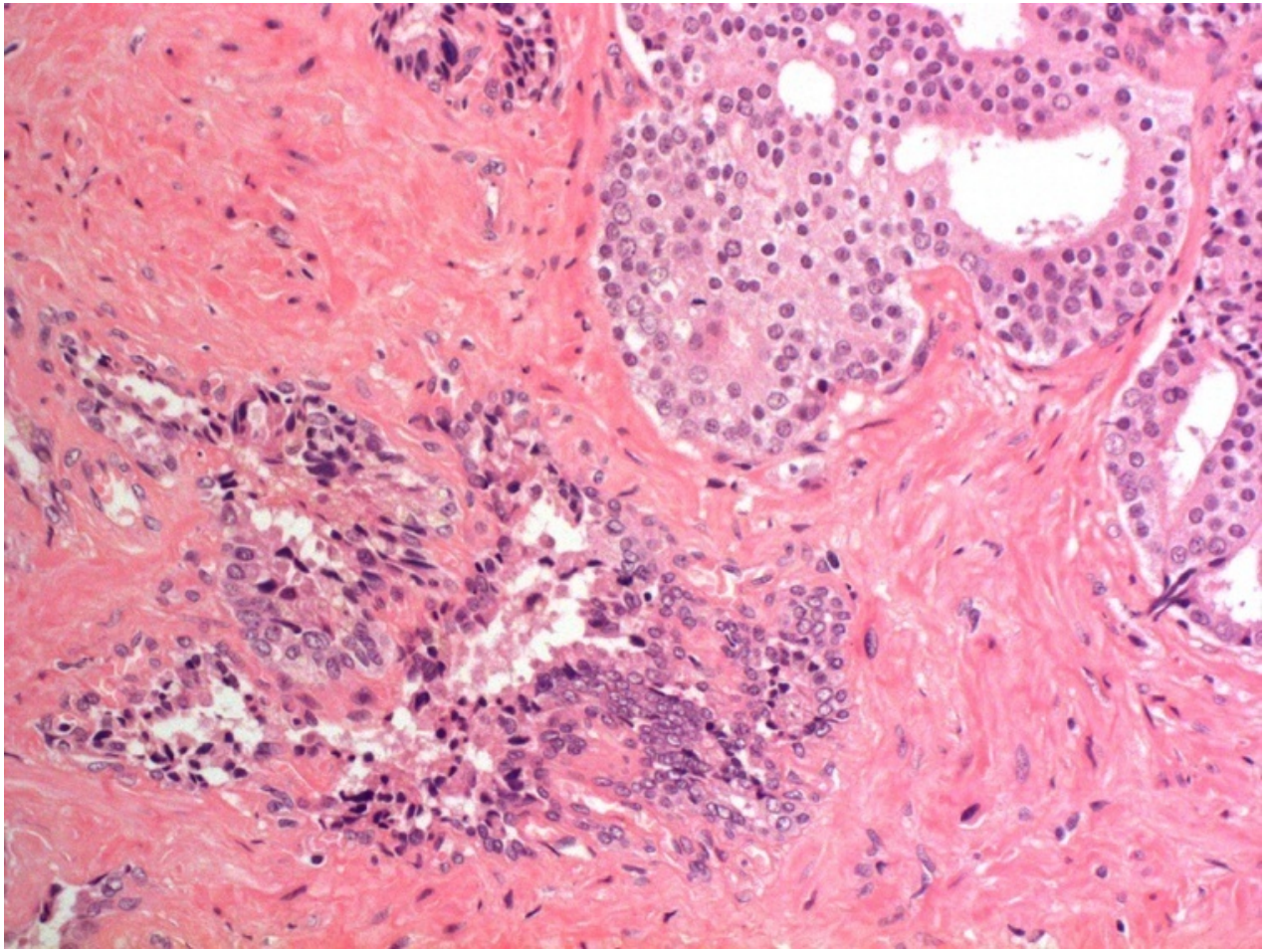
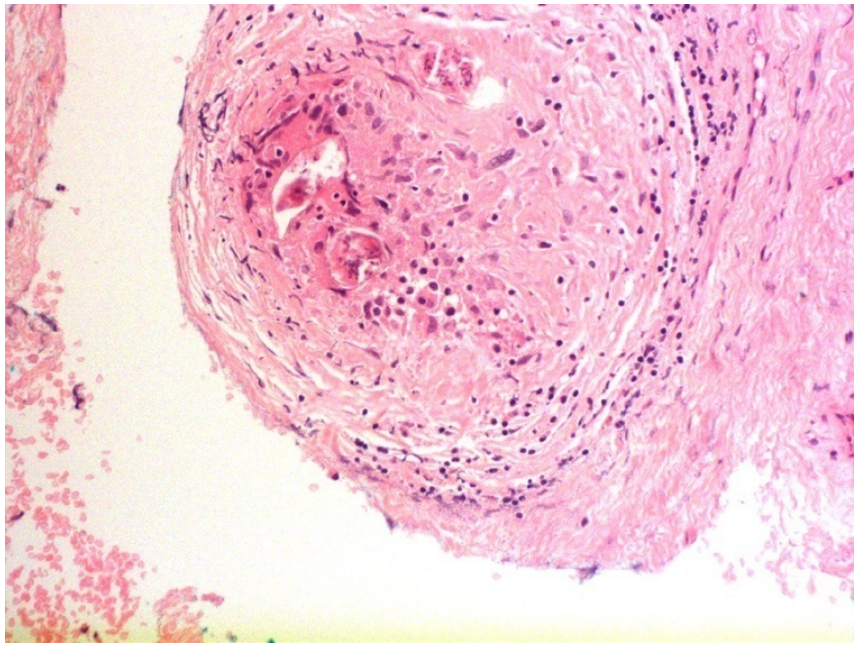
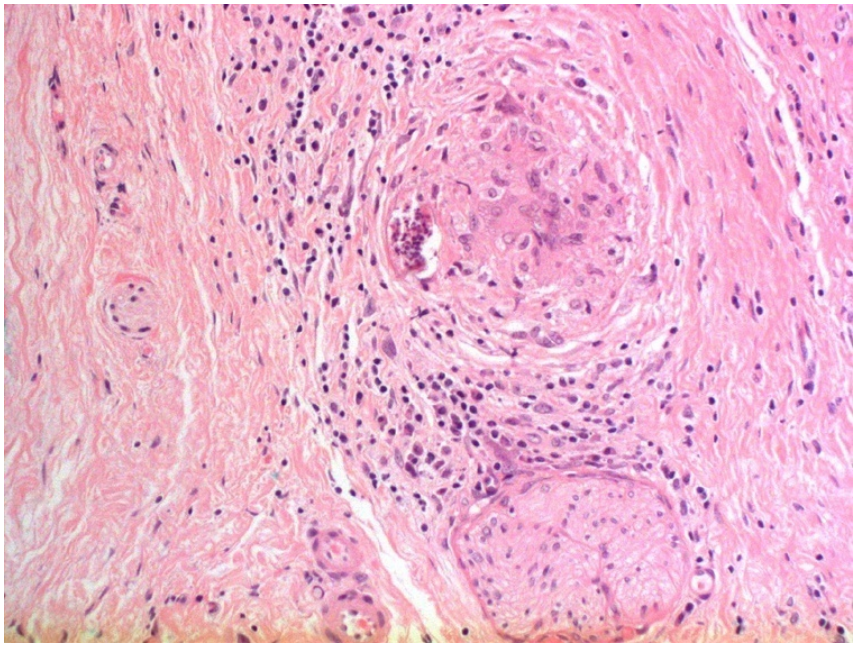


P9





P9

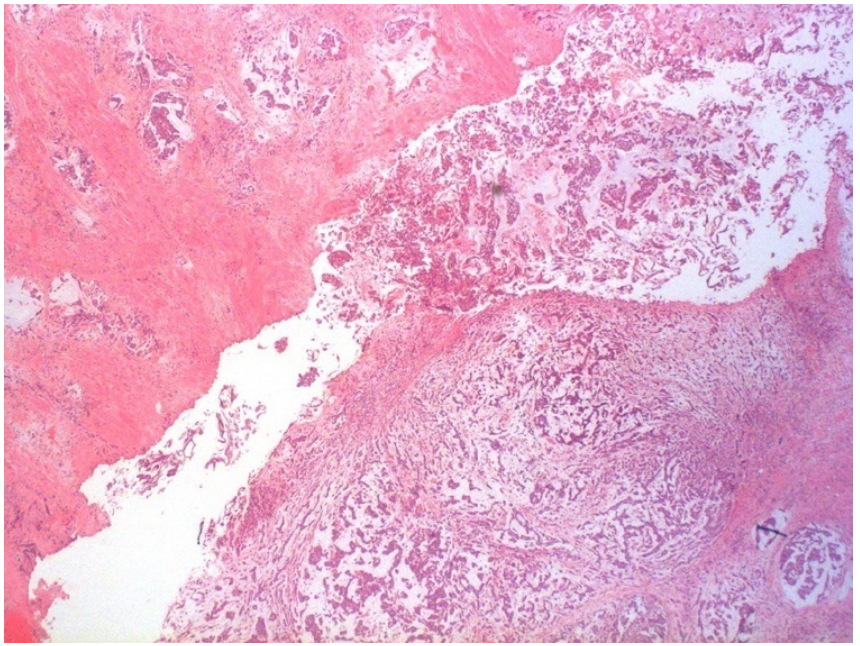
Prostatic adenocarcinoma invading seminal vesicle

Schistosomiasis

- Note on prostate biopsy – cannot distinguish ejaculatory duct and seminal vesicle (unless biopsy stated to be from seminal vesicle)

P10

- Male 82 yrs
- PSA 50, on hormones
- TURP



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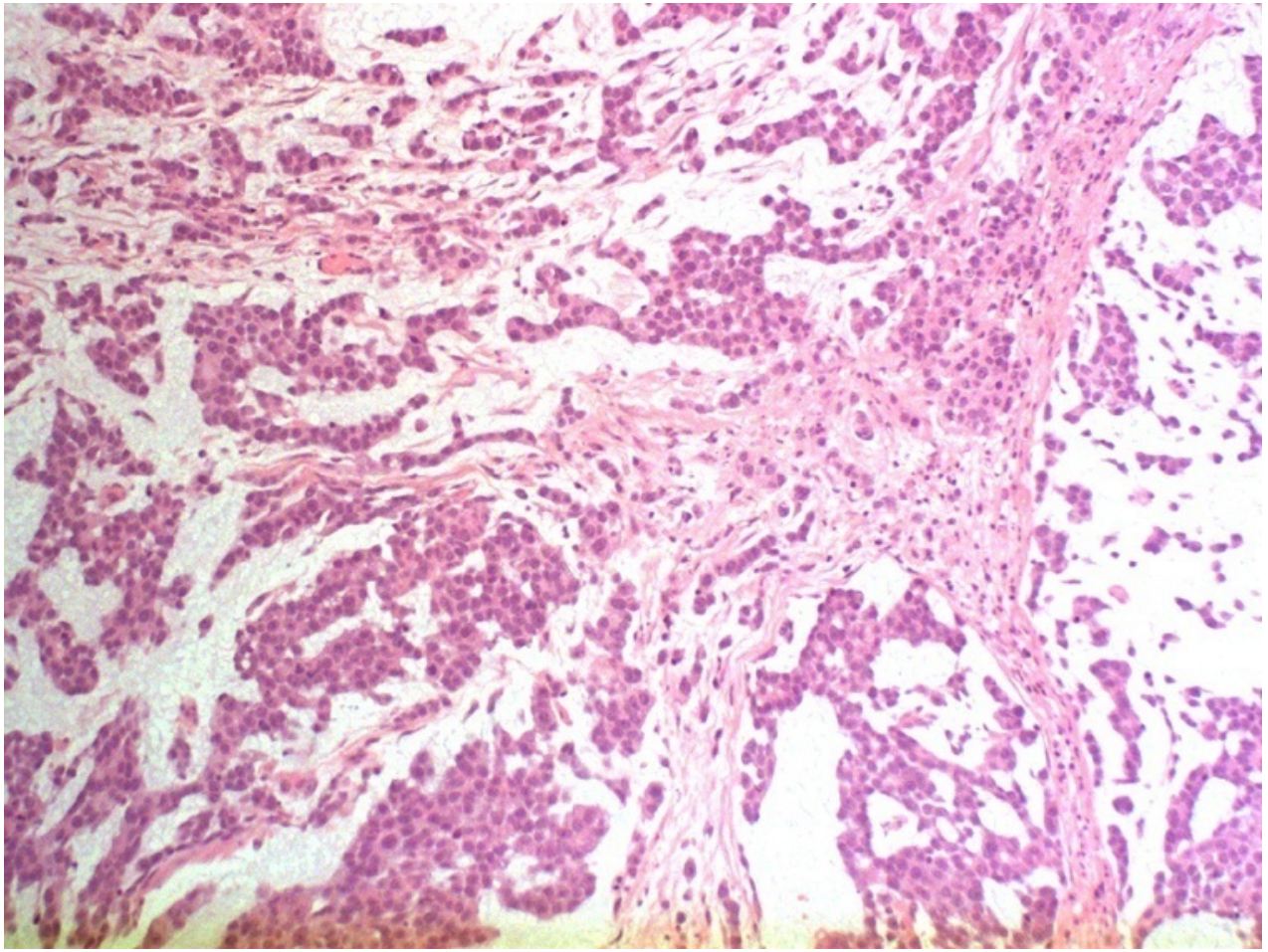

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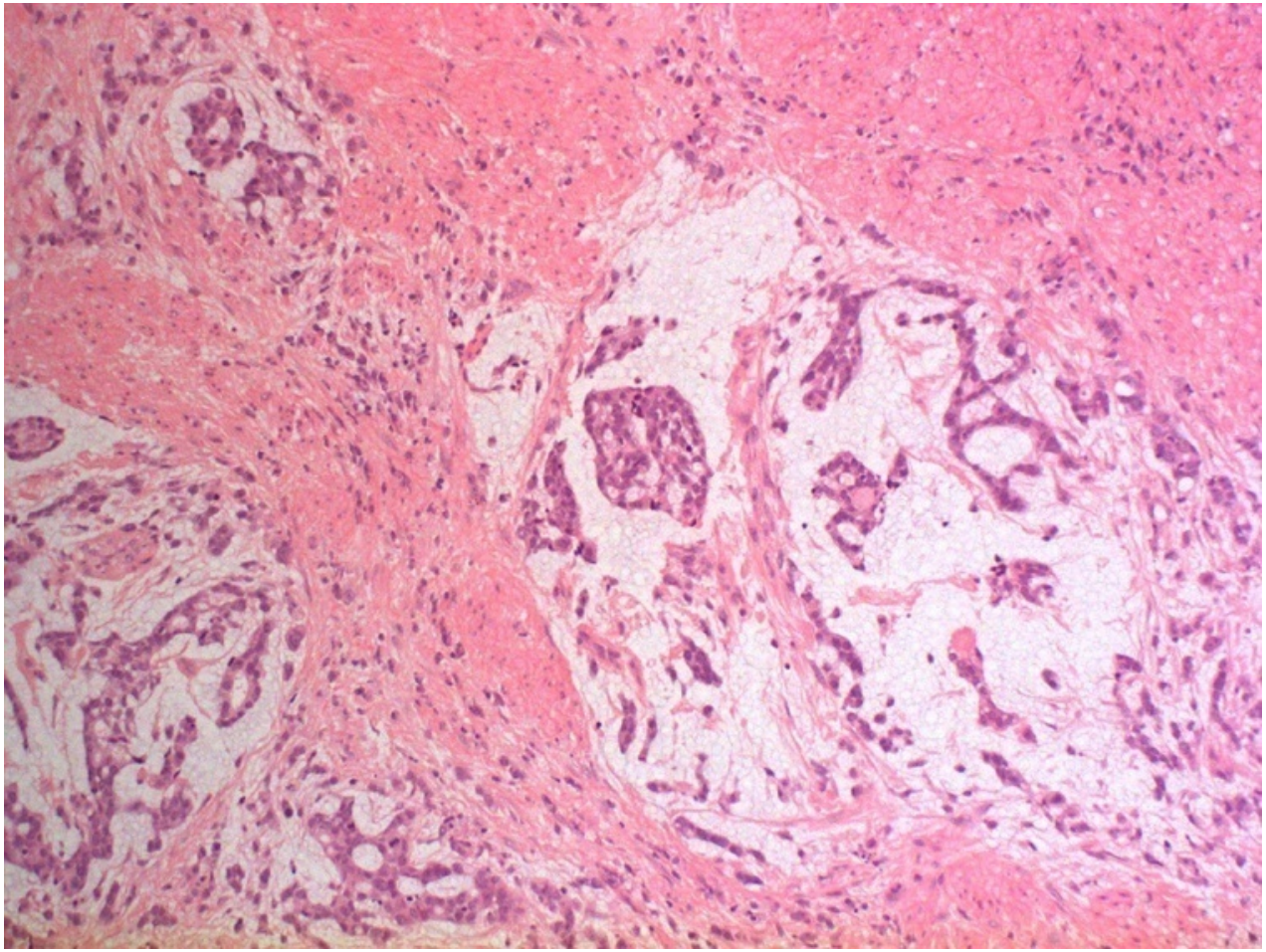

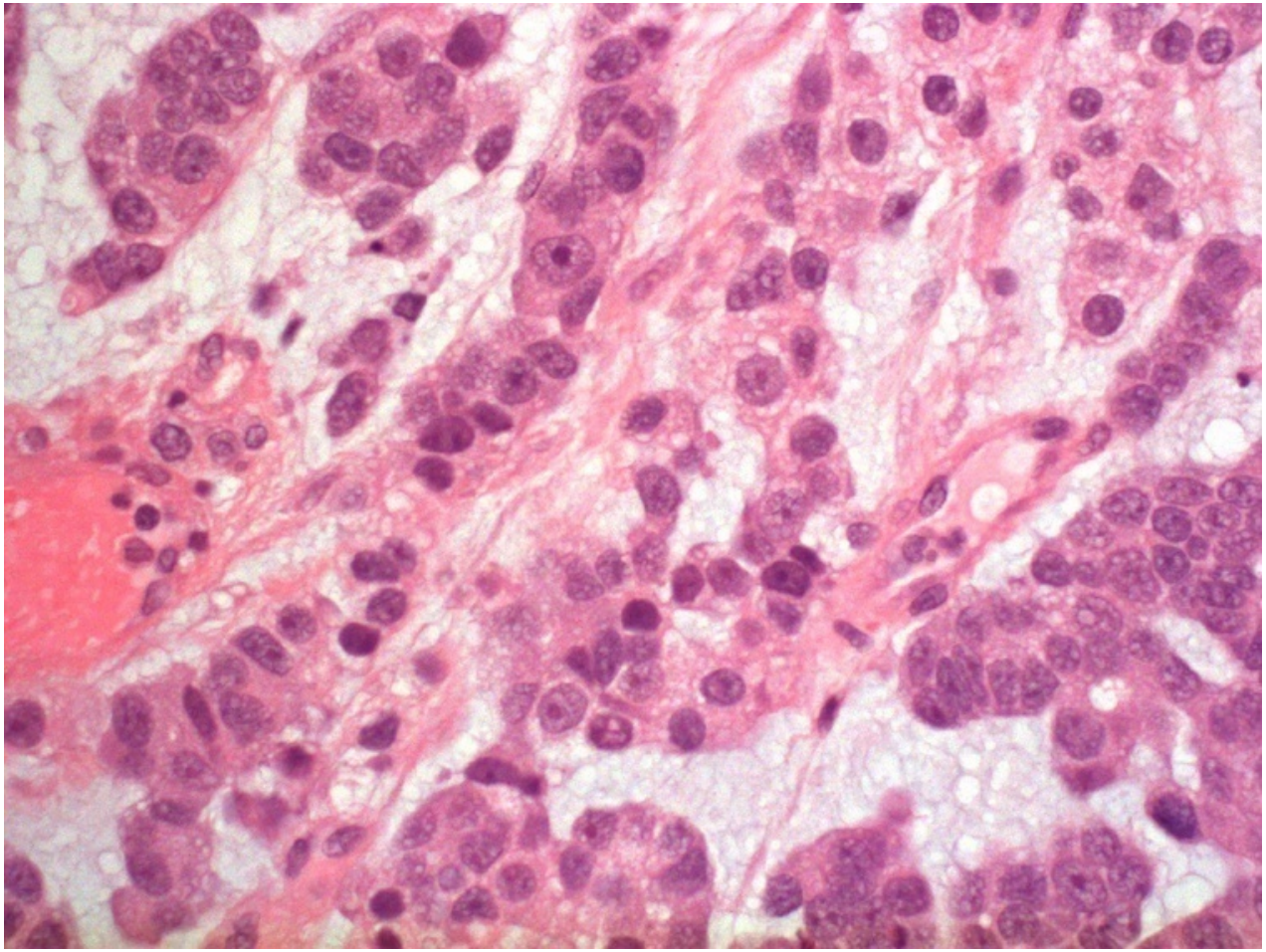

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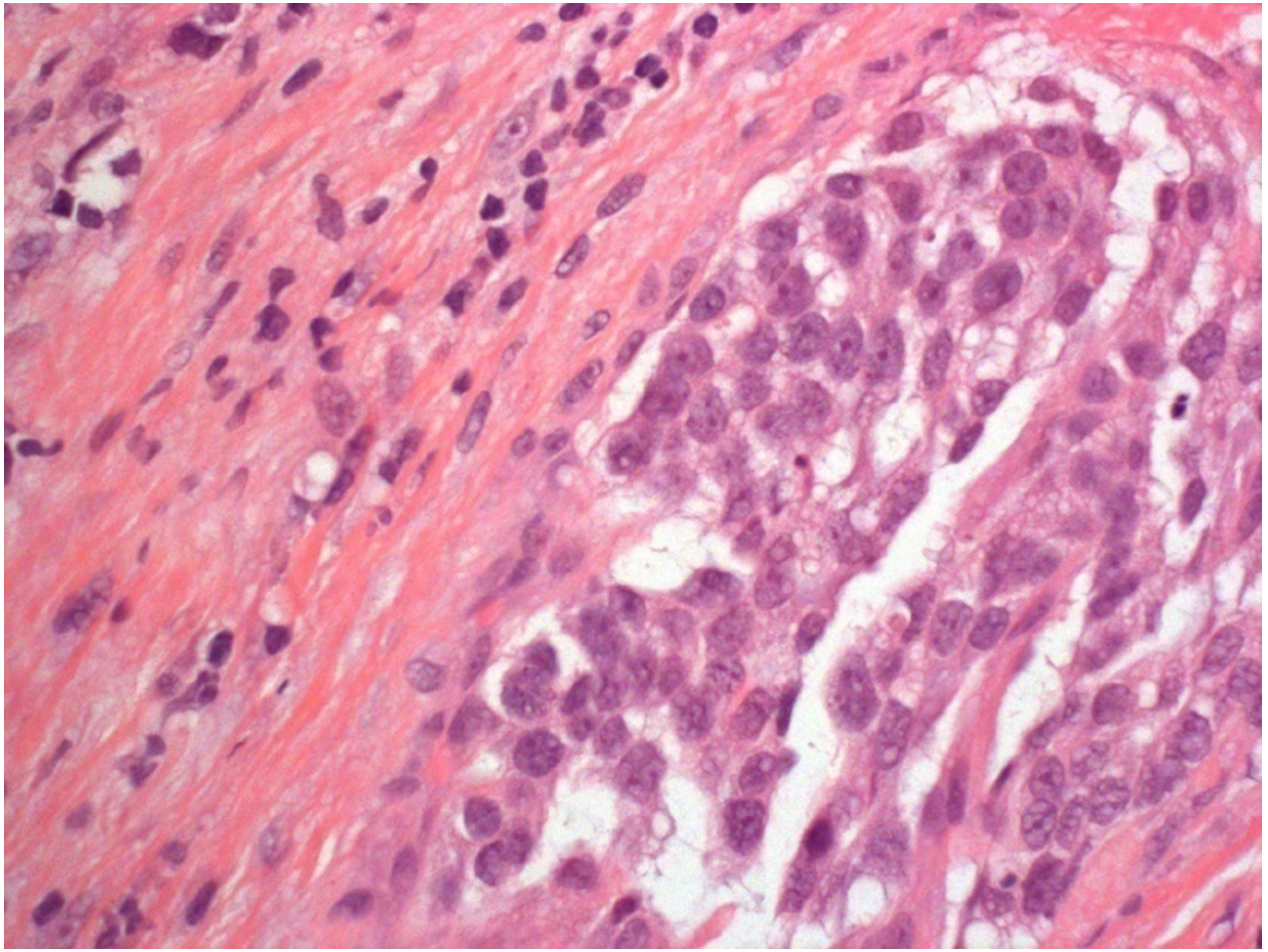


P10

Mucinous (colloid) adenocarcinoma of prostate

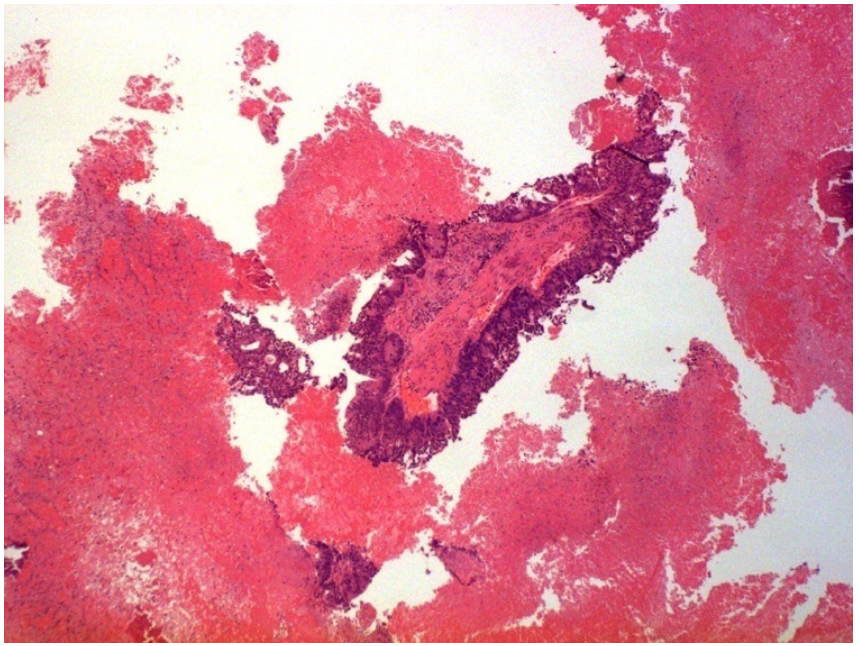
- 25% or more of tumour must be mucinous (so not biopsy diagnosis)
- Exclude metastasis

- May see mucinous change with hormone treatment

- Other variants/patterns of prostate cancer:
  - Foamy gland, atrophic, signet ring, pseudohyperplastic, ductal, PIN-like

P11

- Male 82 yrs
- Previous urothelial carcinoma G3 pTa in bladder.
- Papillary tumour in prostatic urethra resected.



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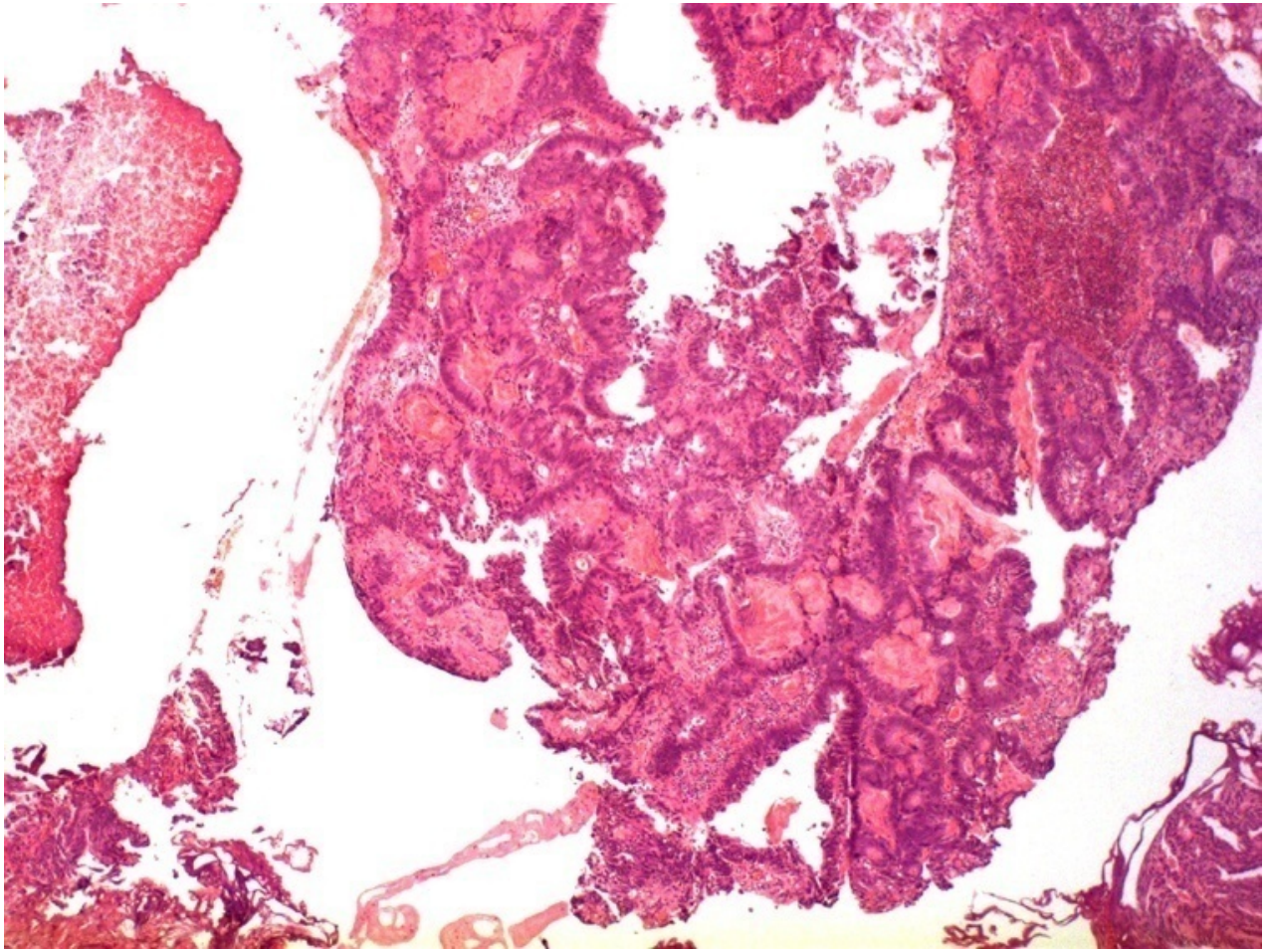

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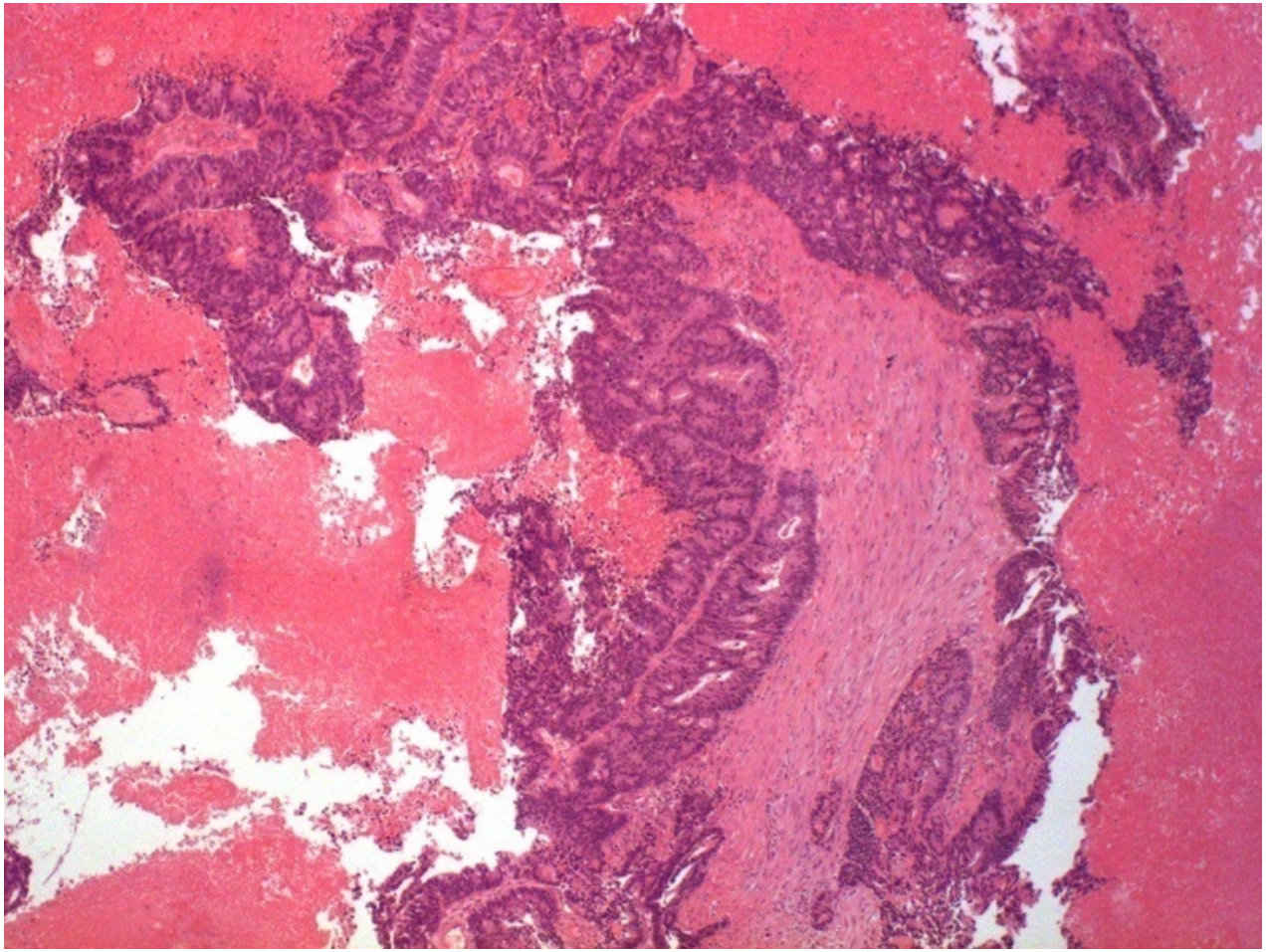

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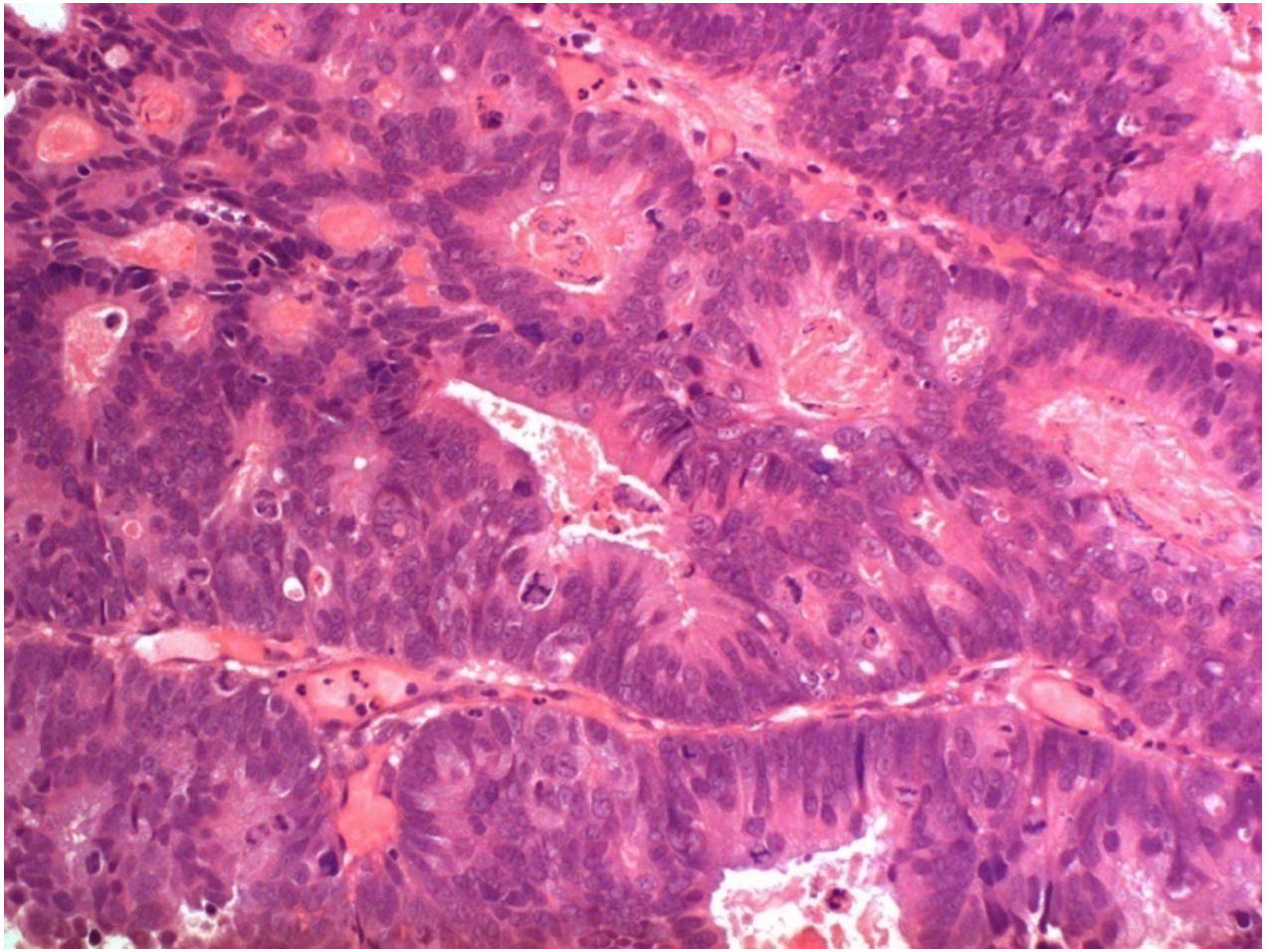
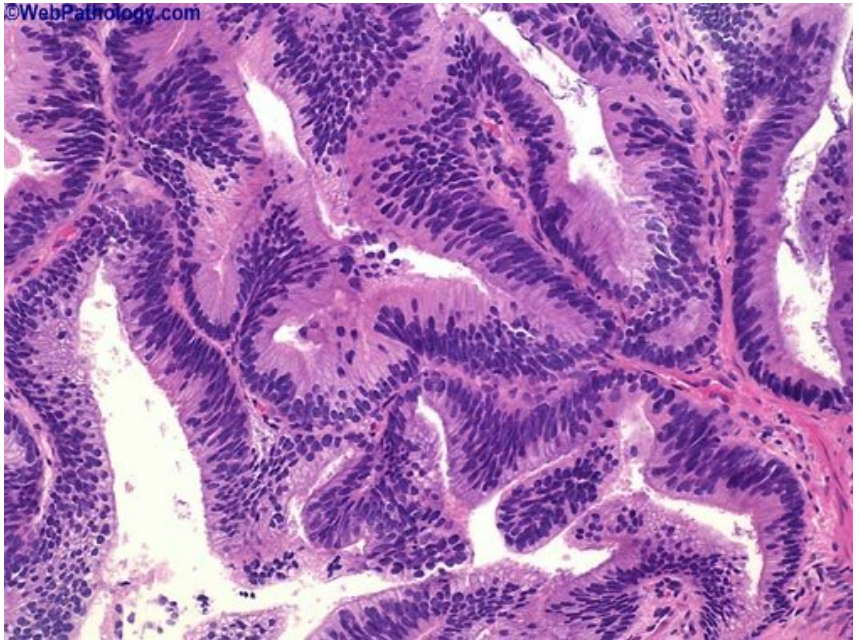


P11

- **Rectal adenocarcinoma invading prostate**

DD

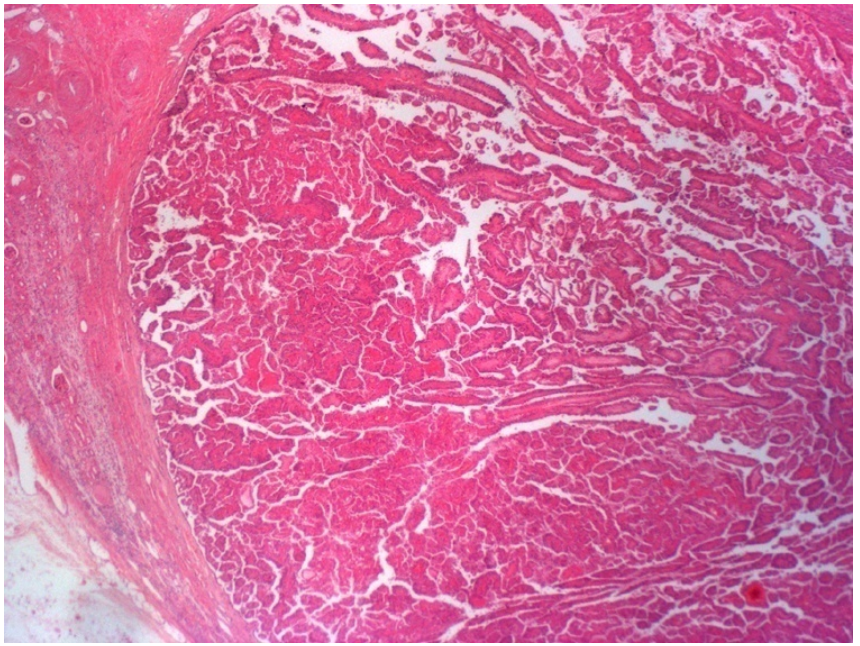
- Ductal adenocarcinoma of prostate
  - Often centrally located, producing a mass in urethra
  - Often mixed with typical acinar adenocarcinoma
  - PSA and PSAP positive; 70% AMACR positive



Kidney

K2

- Male 72 yrs
- Nephrectomy - 2 masses and 1 cyst.
- Section includes masses and cyst



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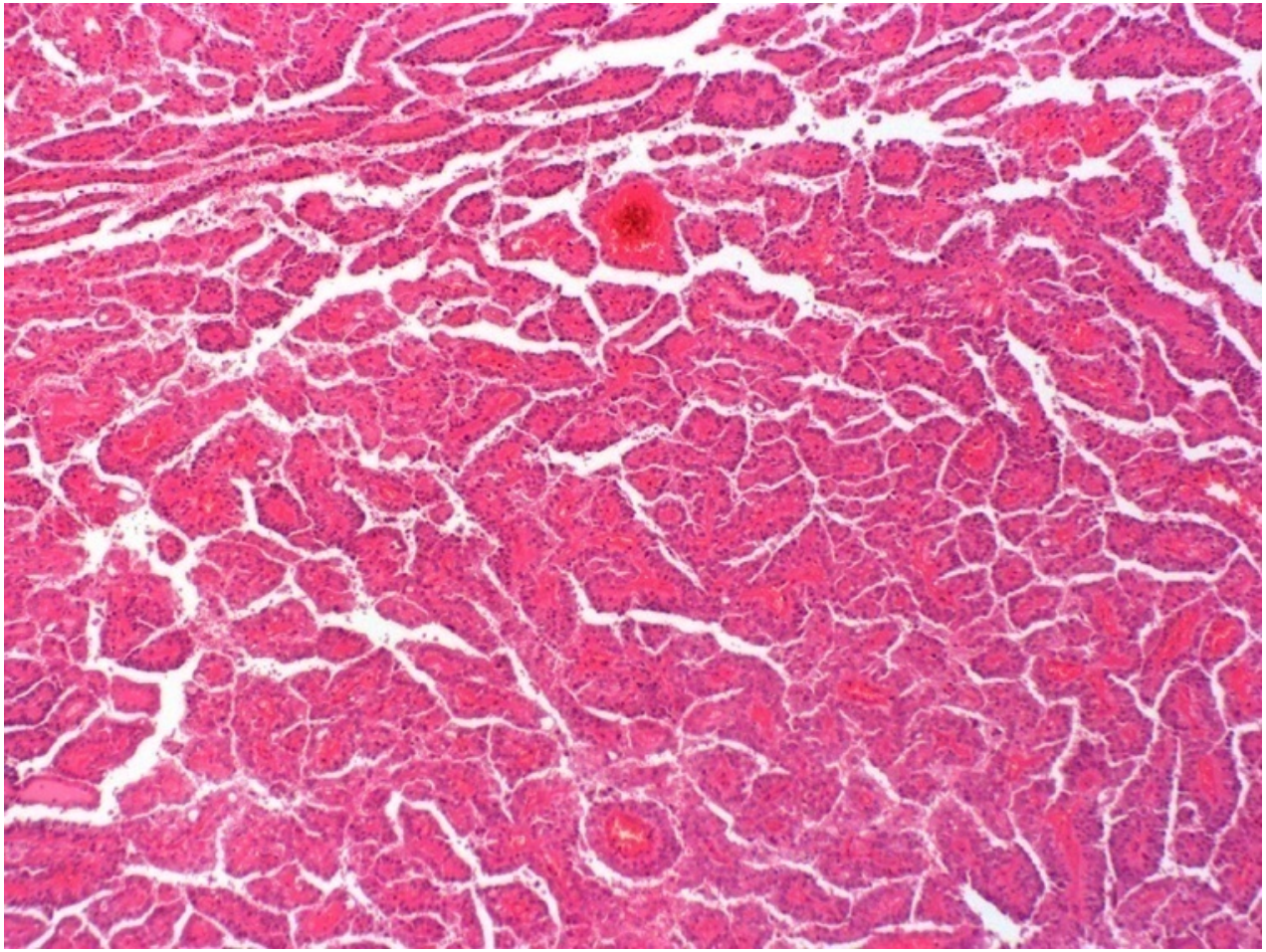

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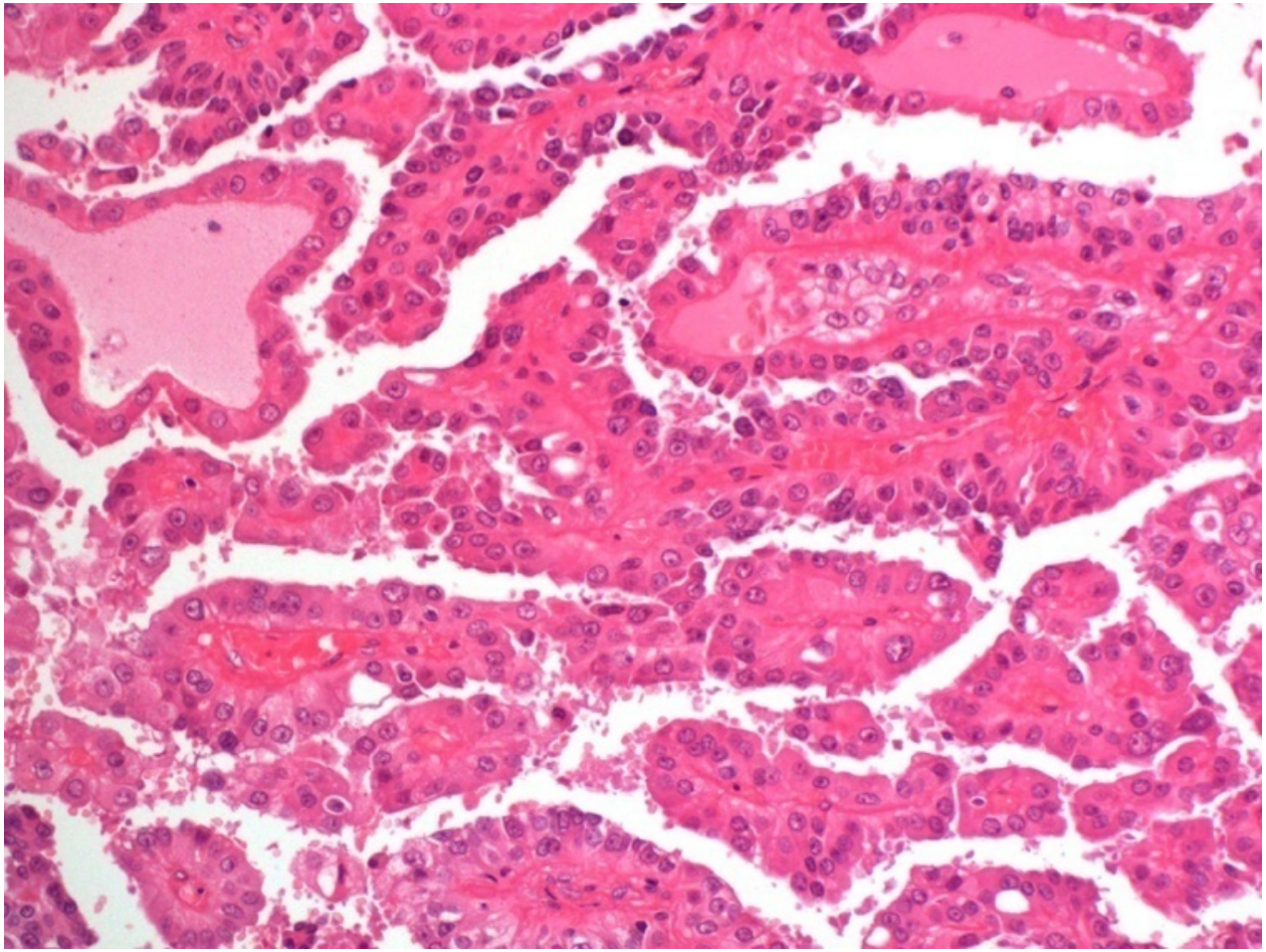

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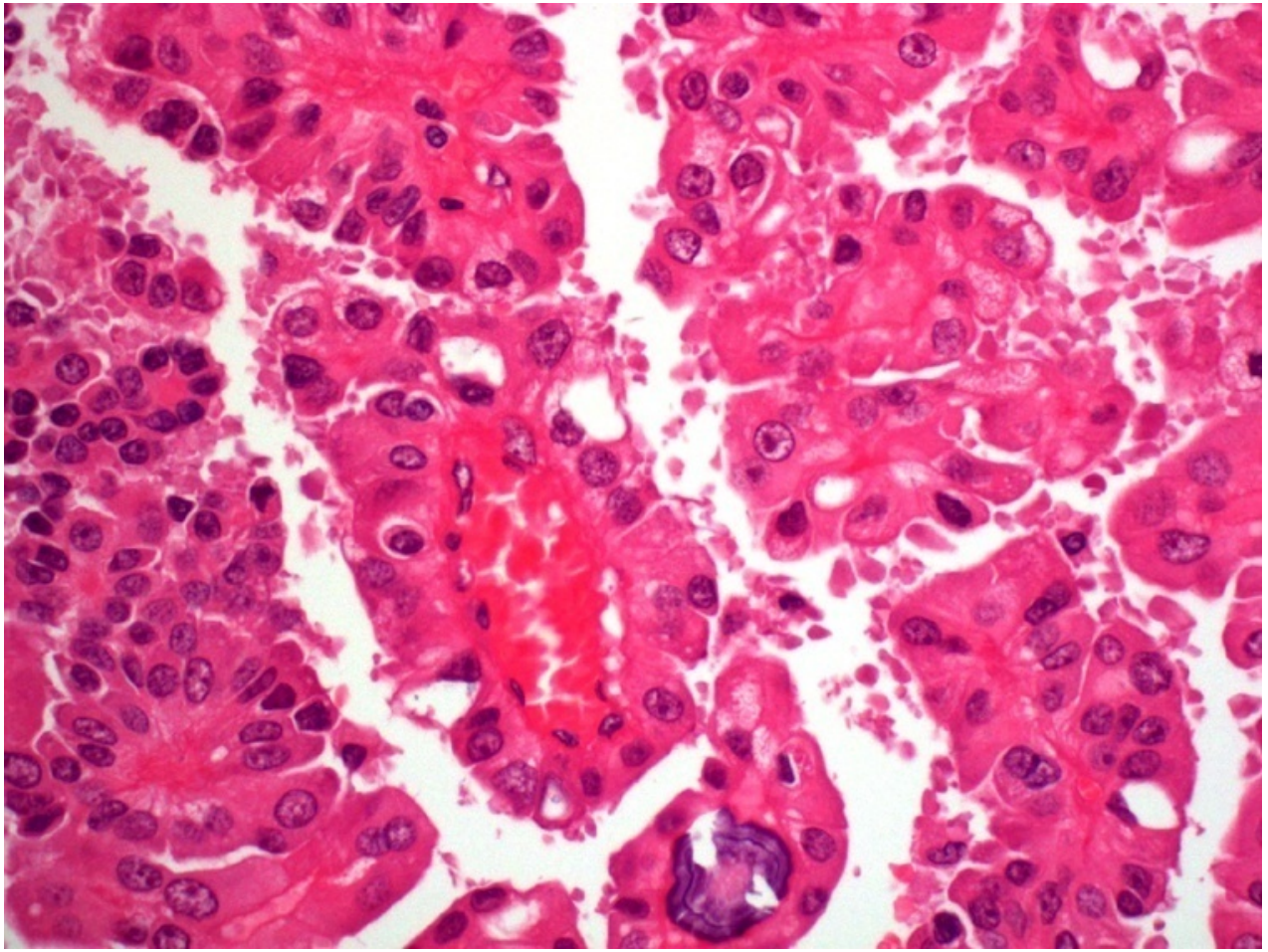

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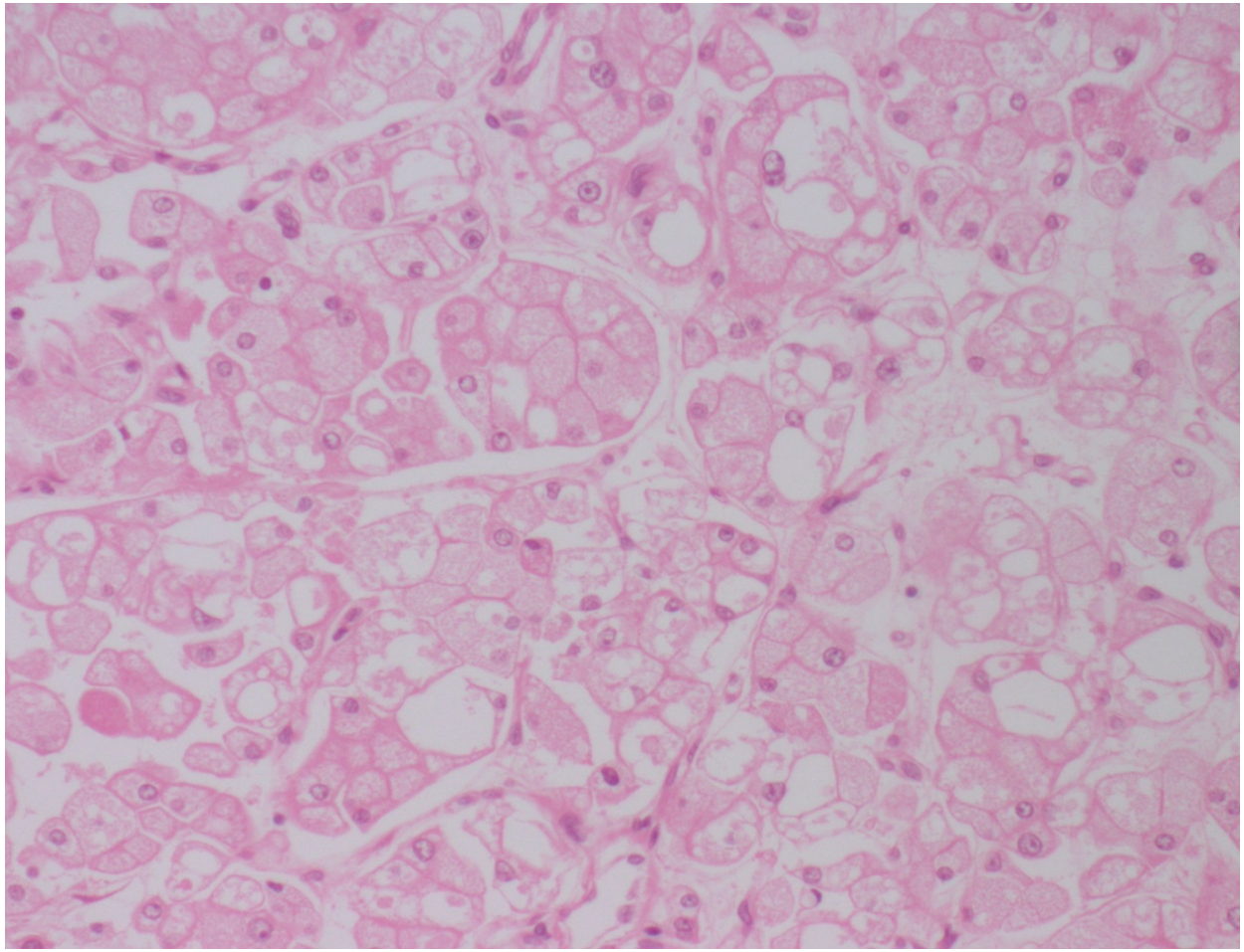

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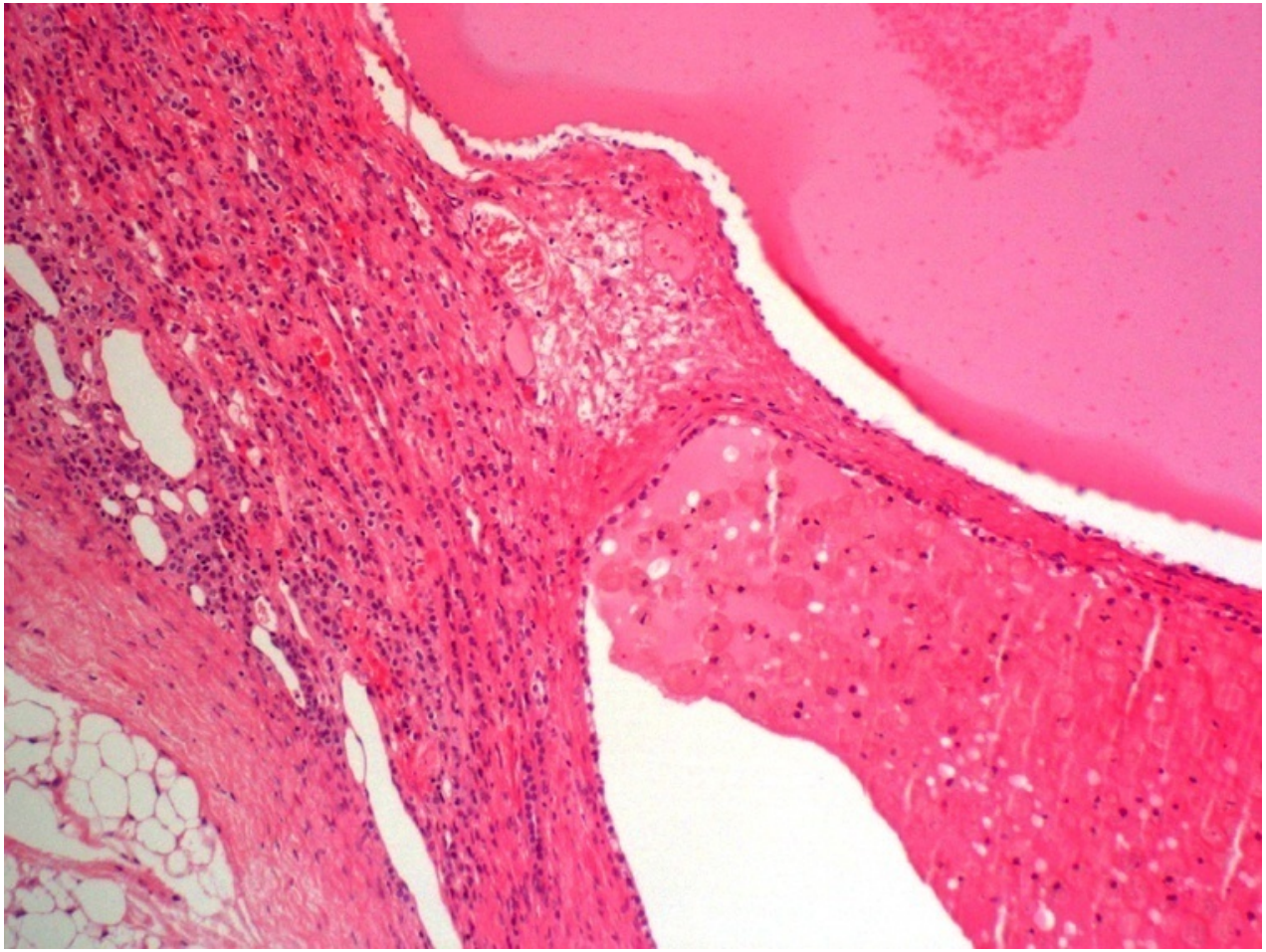


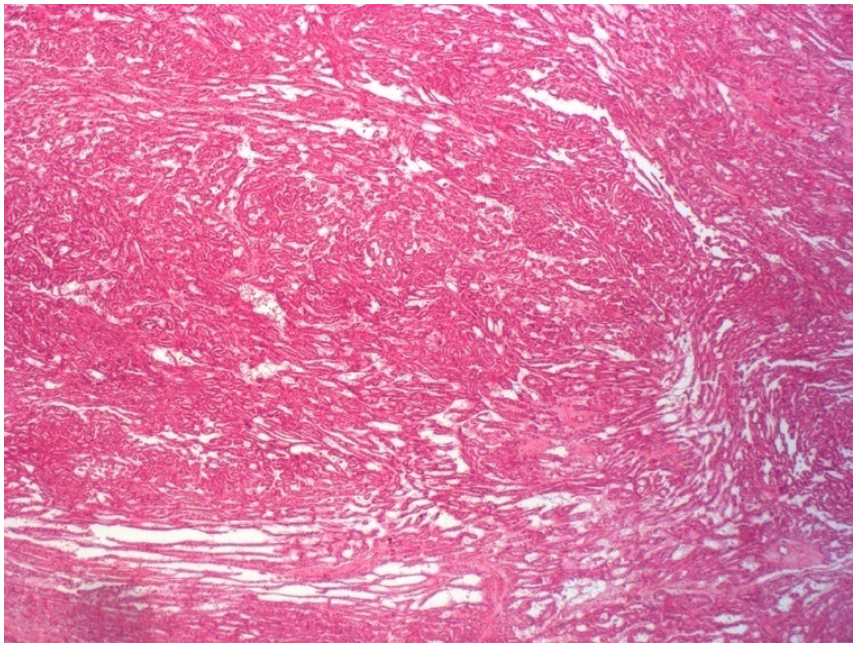
K2

Papillary RCC type 2 , Chromophobe RCC and simple cyst

- **Papillary RCC**
  - Sporadic - trisomy 7 and 17 loss of Y
  - Hereditary forms – Mutations in MET oncogene
  - More often bilateral and multifocal than other RCCs
  - Types 1 and 2
  - IHC: CK7+ (esp type 1) AMACR+ CD10+ RCC+ pax-8+ Vim +/- EMA +/- CA-IX +/-
  - WHO/ ISUP Grade applied

K3

- Female 55yrs
- Nephrectomy for 200mm mass



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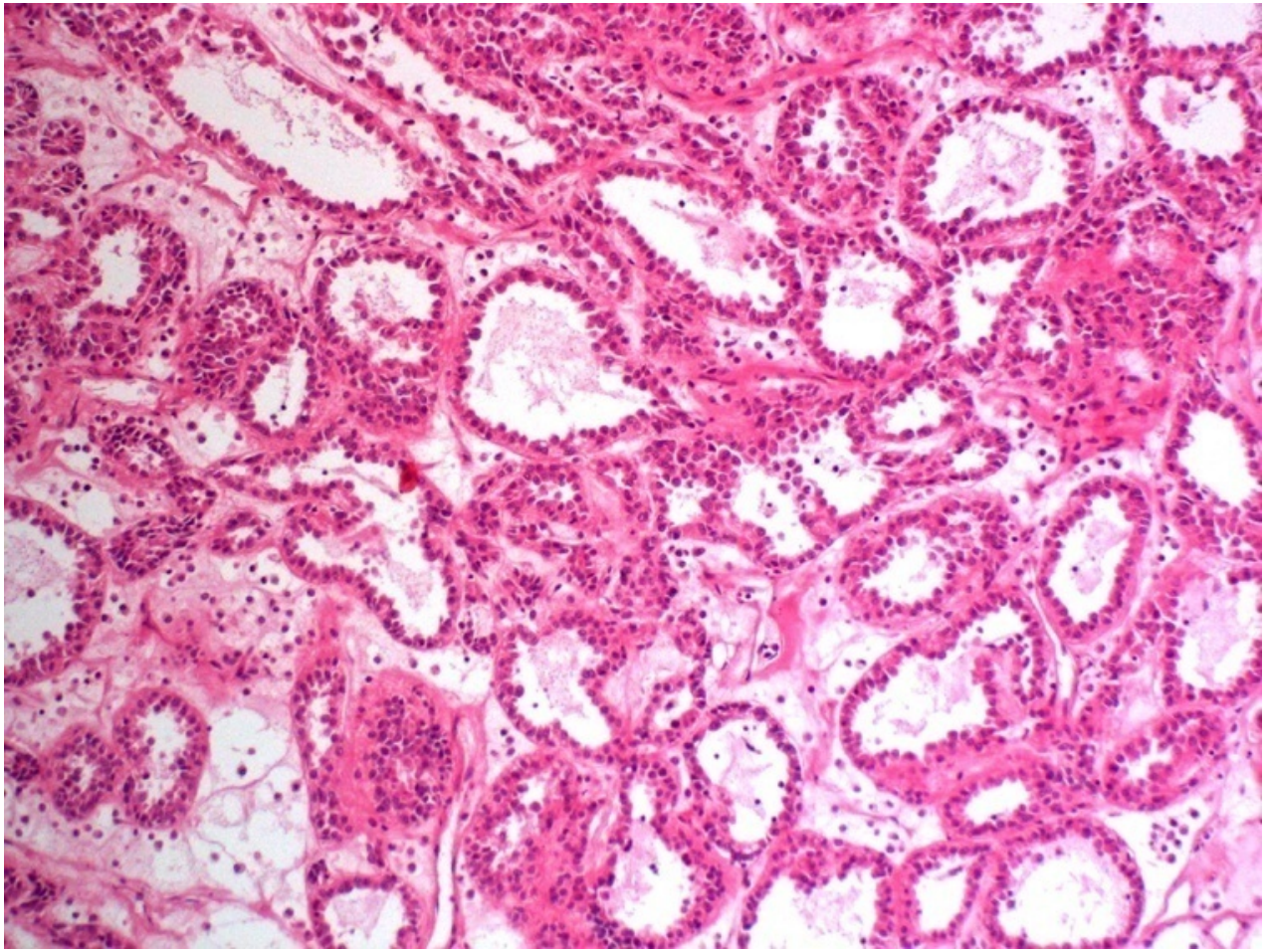
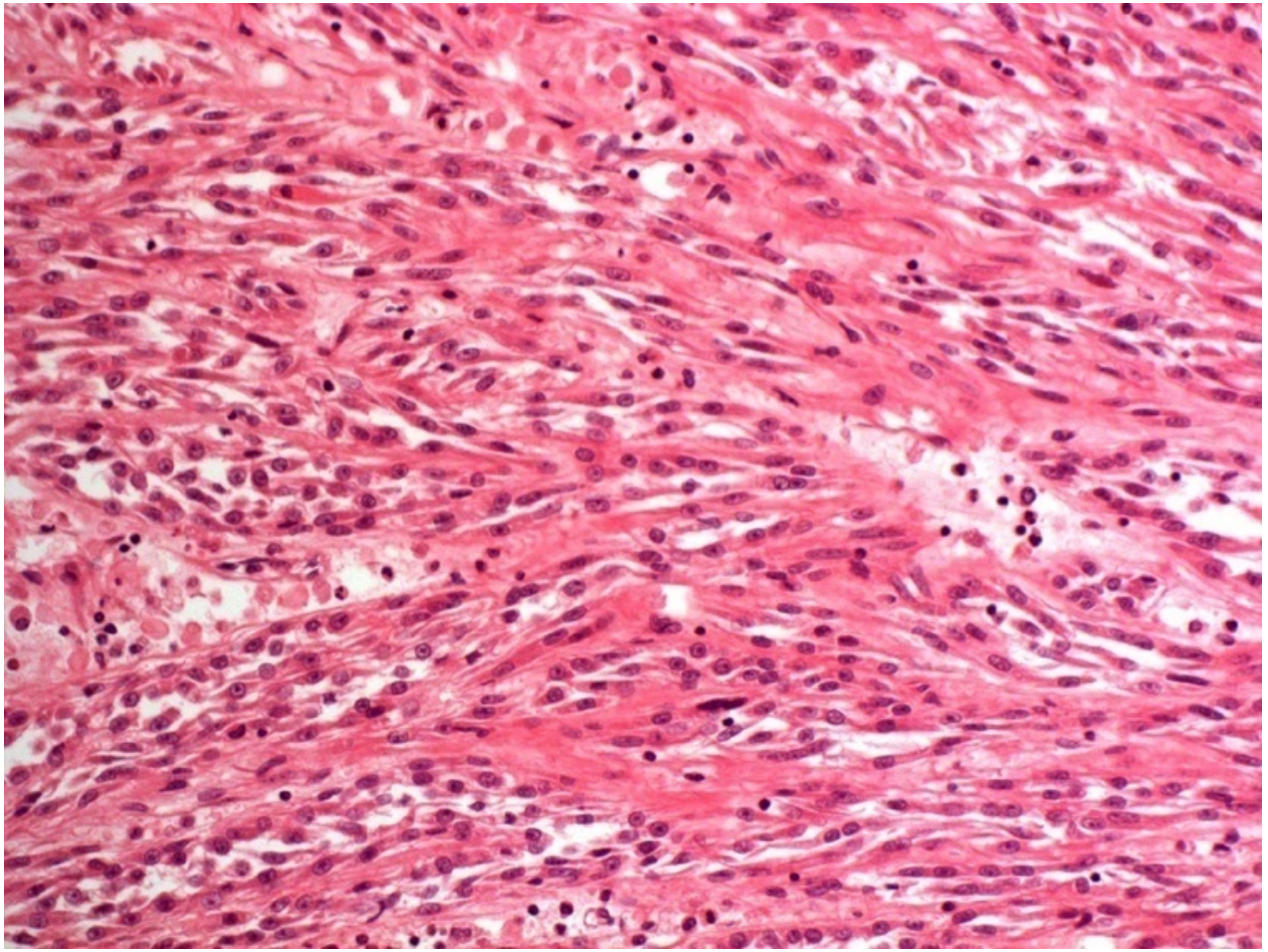
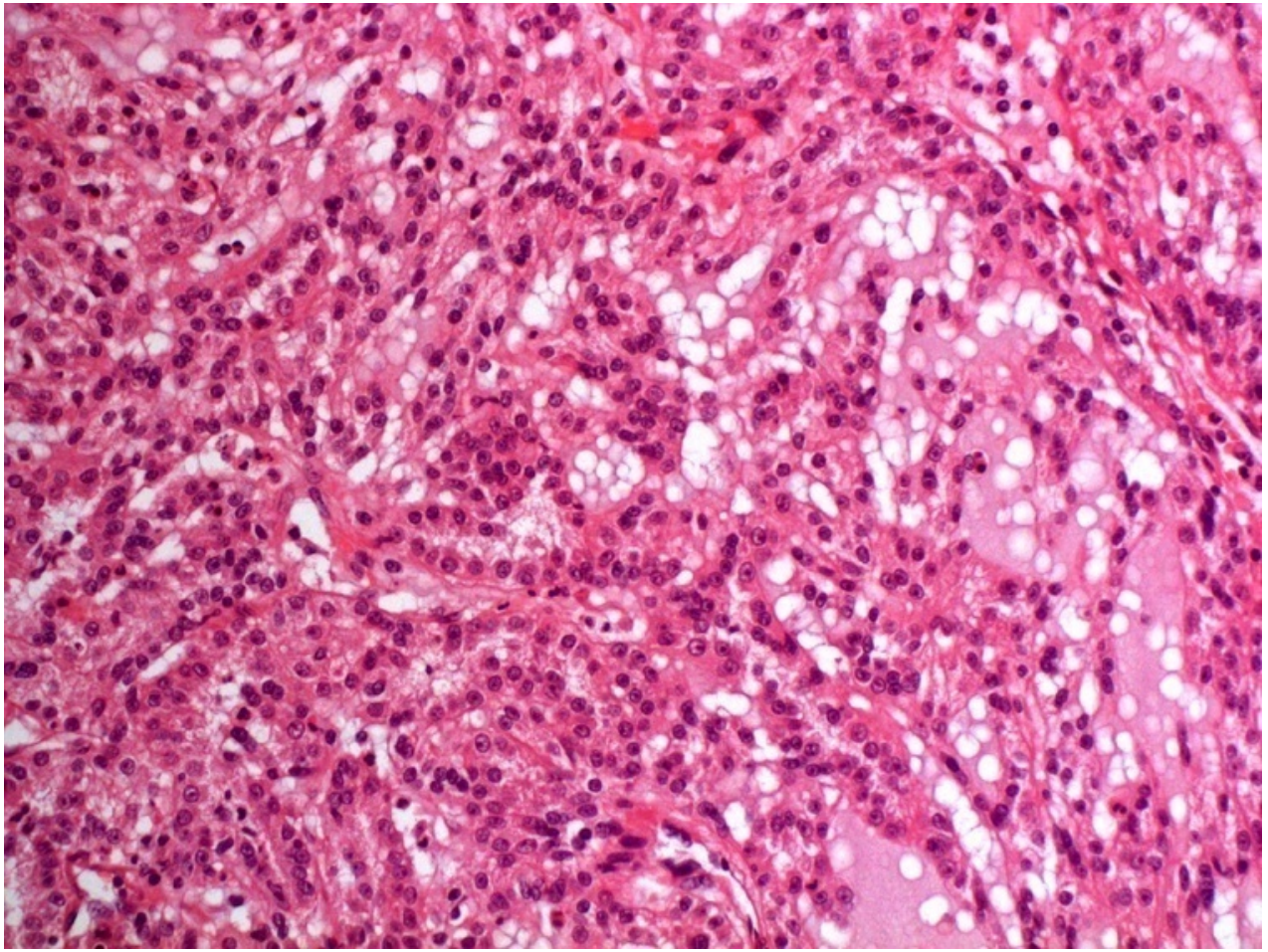


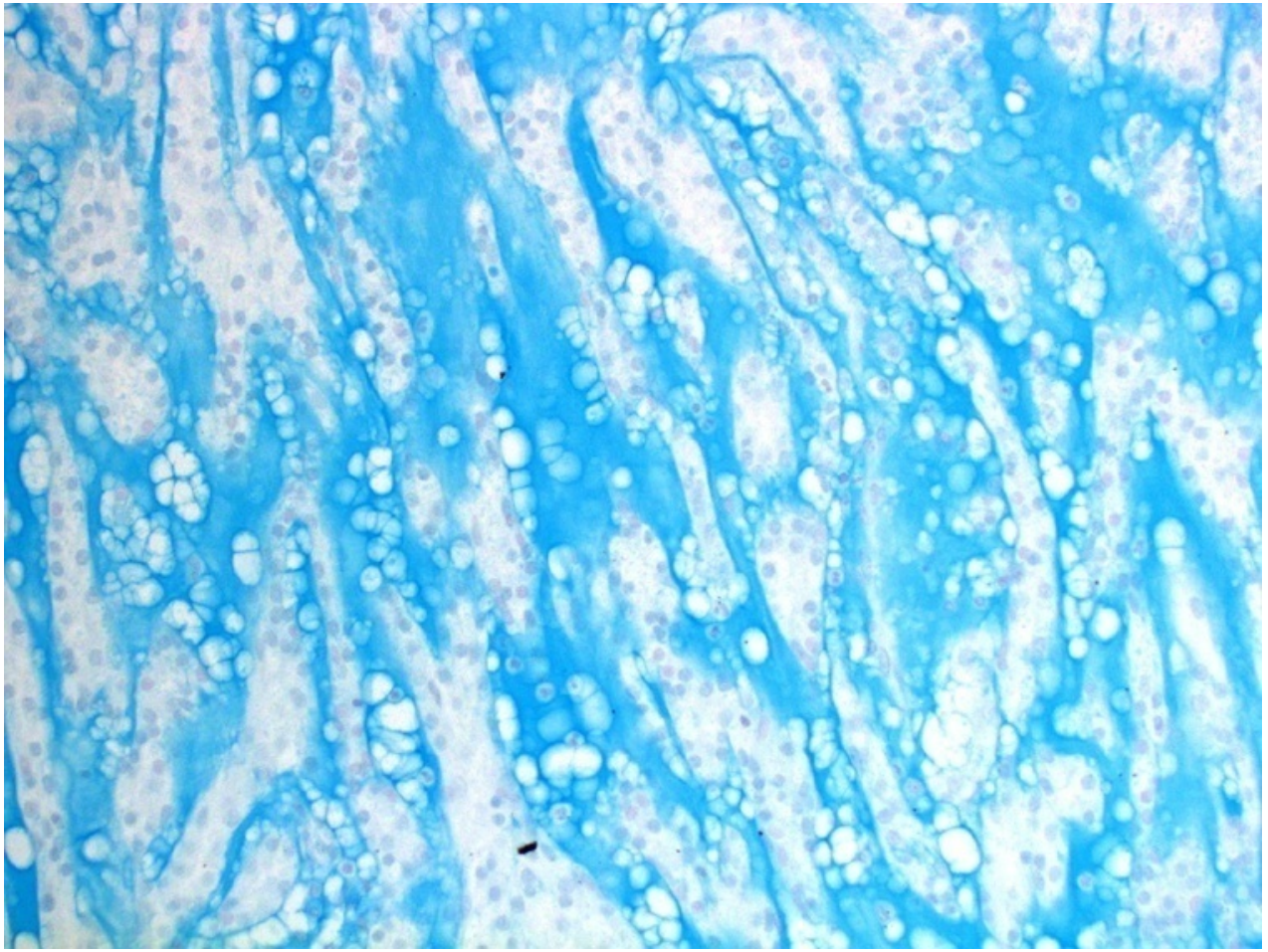
K3



K3



K3 - Alcian blue



K3

Mucinous tubular and spindle cell carcinoma

- Wide age range; Female >male
- Mostly indolent, some LN metastases (as in this case)

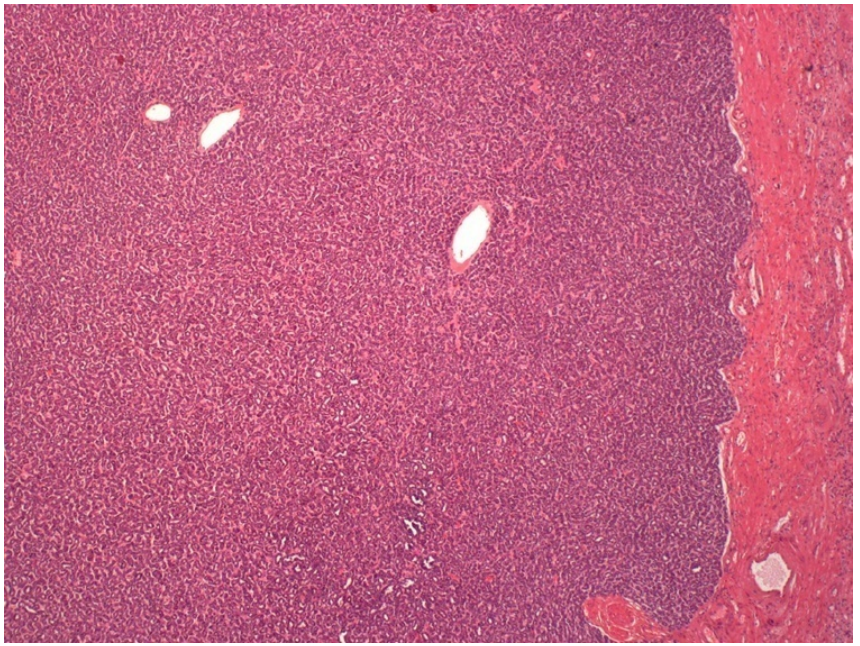
- Tubules – slit-like, branching, low nuclear grade
- Spindle cells, low grade, similar nuclei
- Extracellular mucin
- Very occasional sarcomatoid change
- IHC: CK7+ AMACR+ CD10 +/- Vim+ EMA+

DD

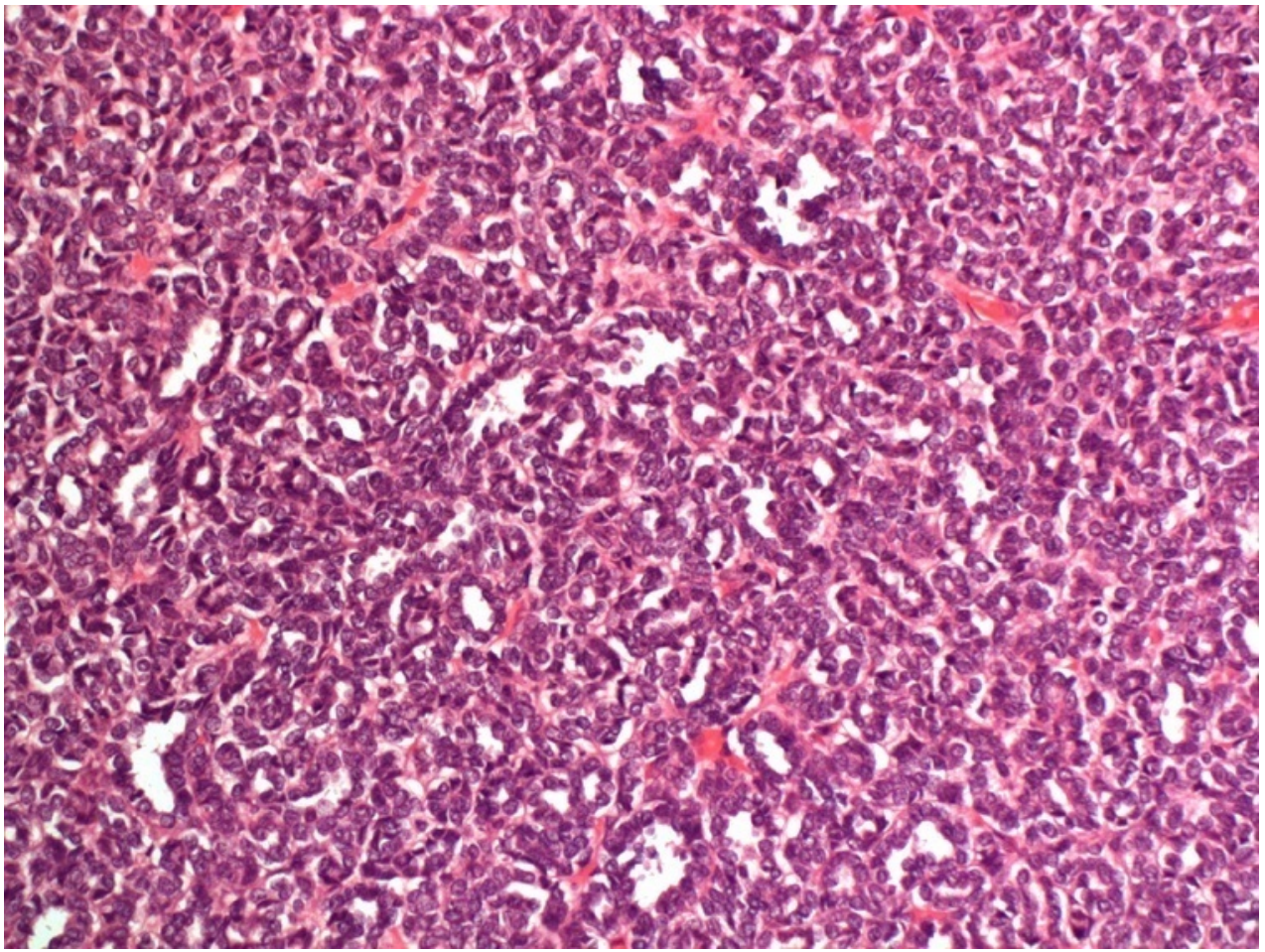
- Papillary RCC – difficult as overlapping features and IHC profile but usually no mucin, has prominent papillary architecture and may have foam cells and psammoma bodies. Trisomy 7 and 17.

K5

- Female 61 yrs
- Nephrectomy for 80mm mass



K5



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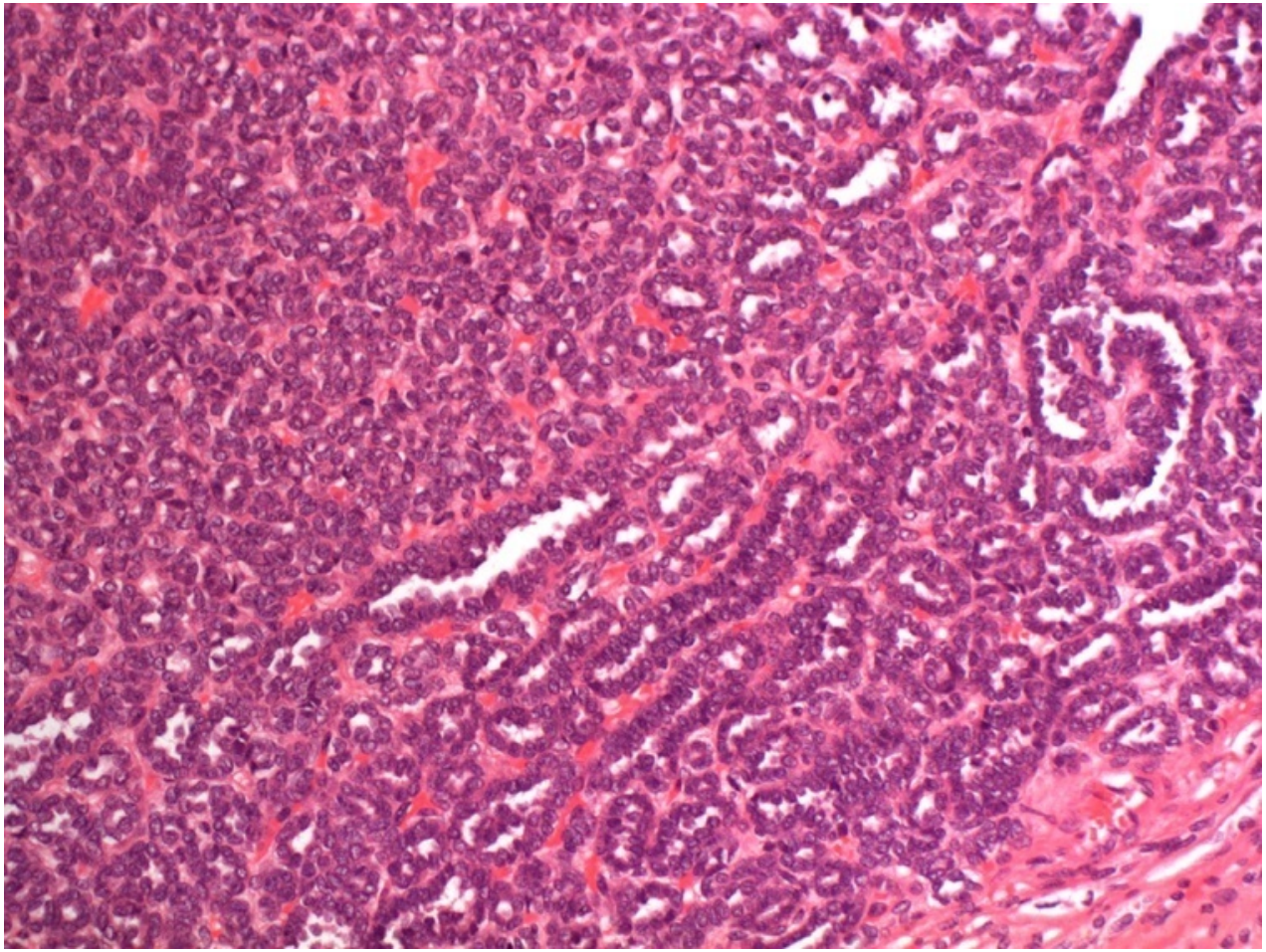

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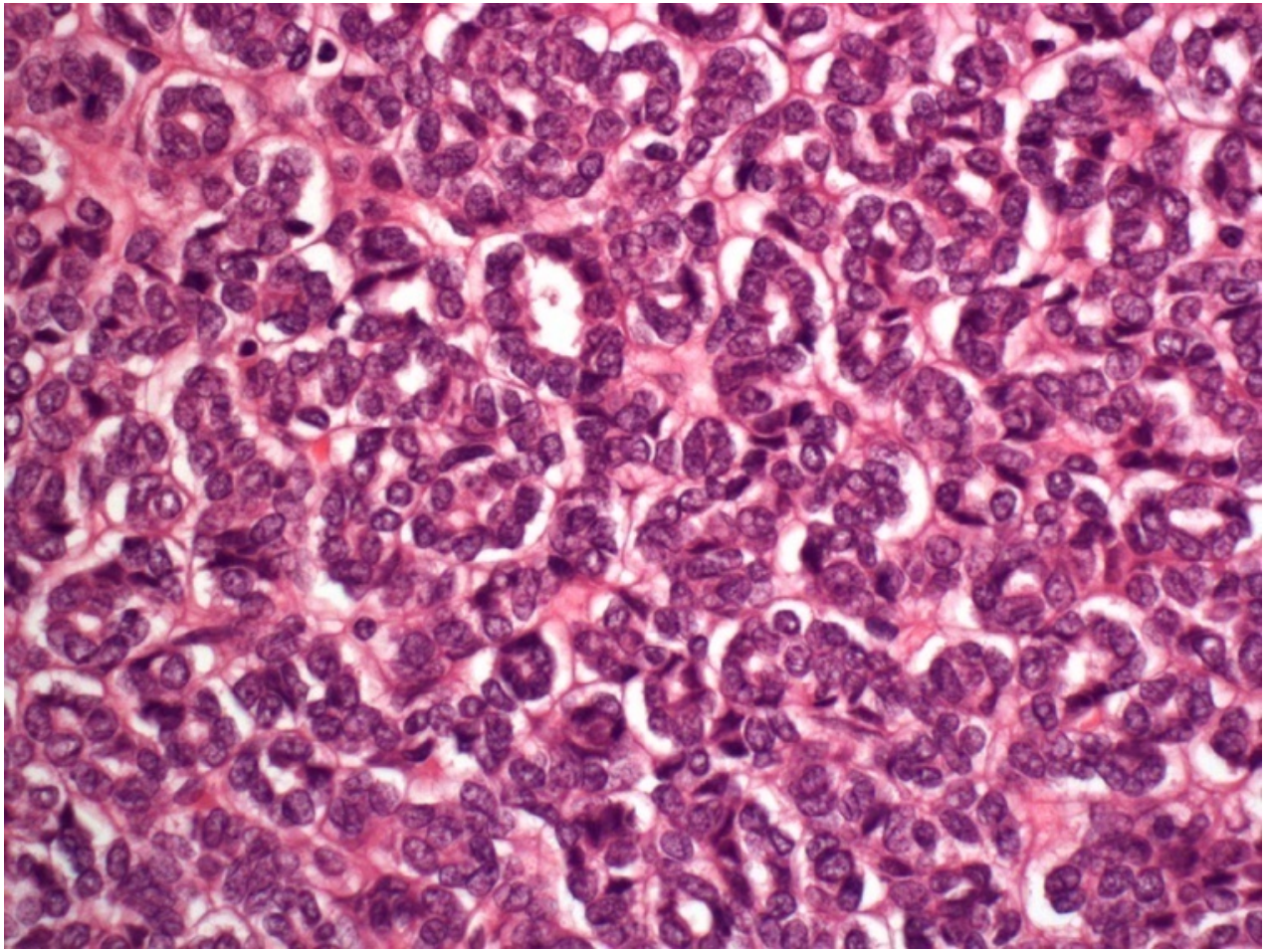


K5

Metanephric adenoma

- Wide age range; female >male; 10-15% polycythaemia
- Benign
- Unilateral, solitary, unencapsulated

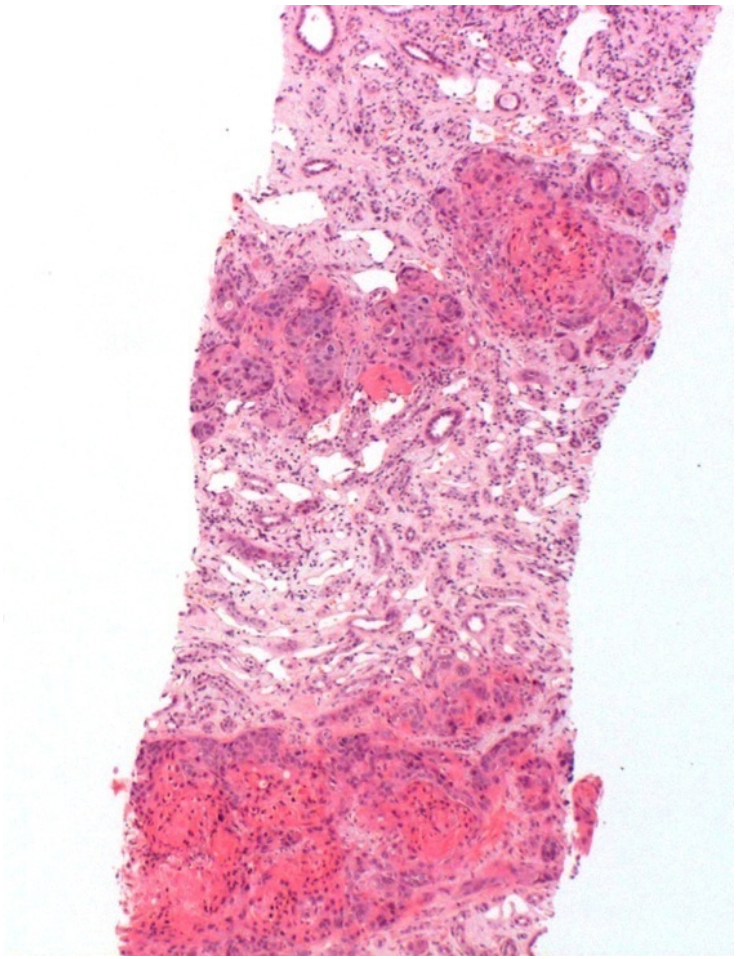
- Frequent calcification (psammoma bodies), haemorrhage, necrosis
- Crowded small acini, bland nuclear features and scanty cytoplasm
- Glomeruloid structures
- IHC: WT1+ (diffuse nuclear), CK7-, AMACR-, CD57+, EMA-, AE1/3 +/-

DD

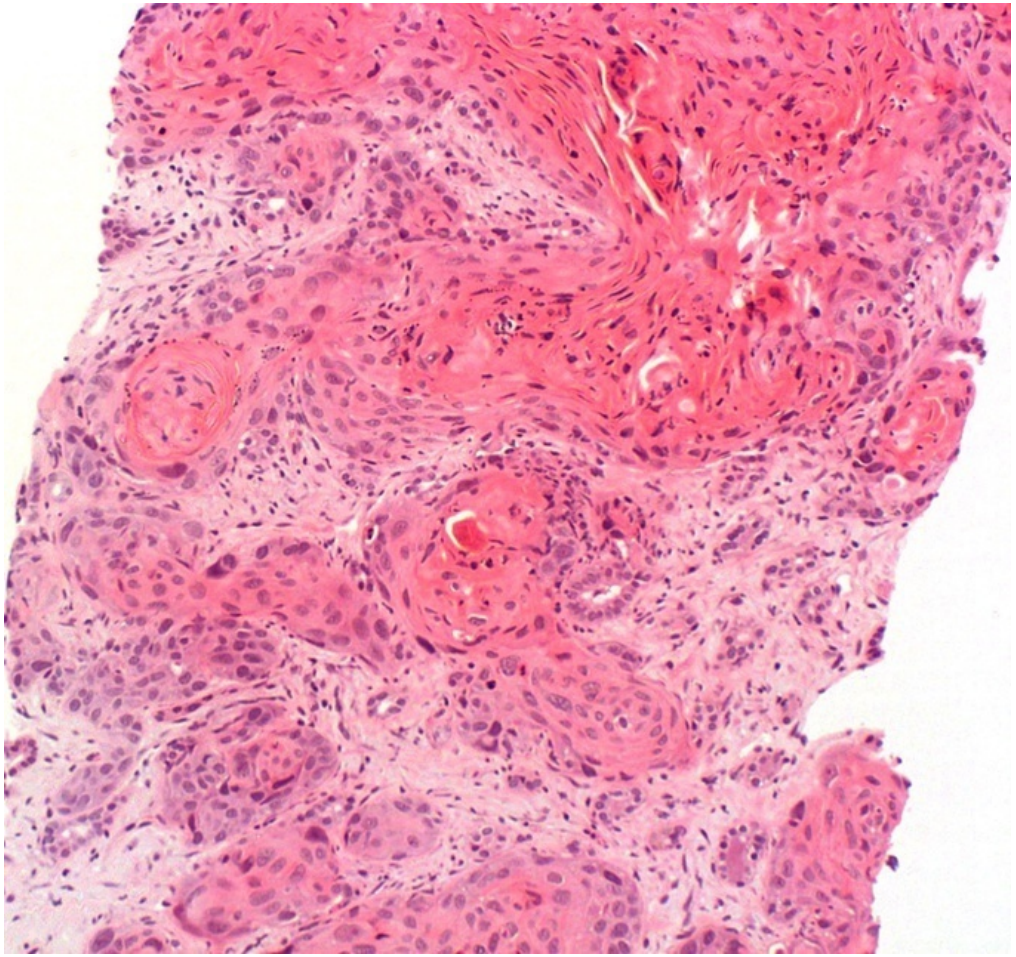
- Papillary renal cell carcinoma WT1-, CK7+, AMACR +, EMA/MUC1+ , CD57-

K11

- Male 77 yrs
- Right renal mass biopsy



K11



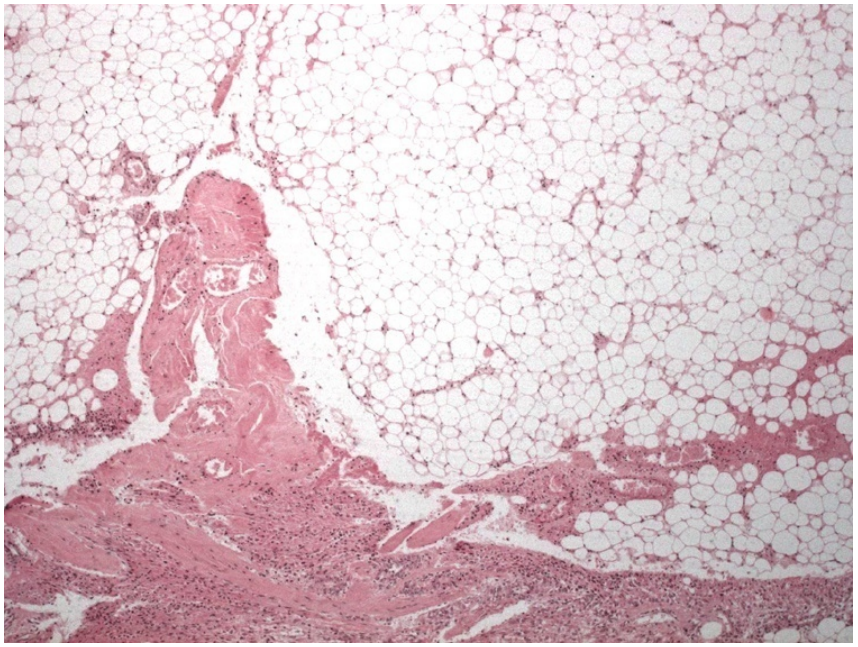
K11

Metastatic oesophageal squamous cell carcinoma

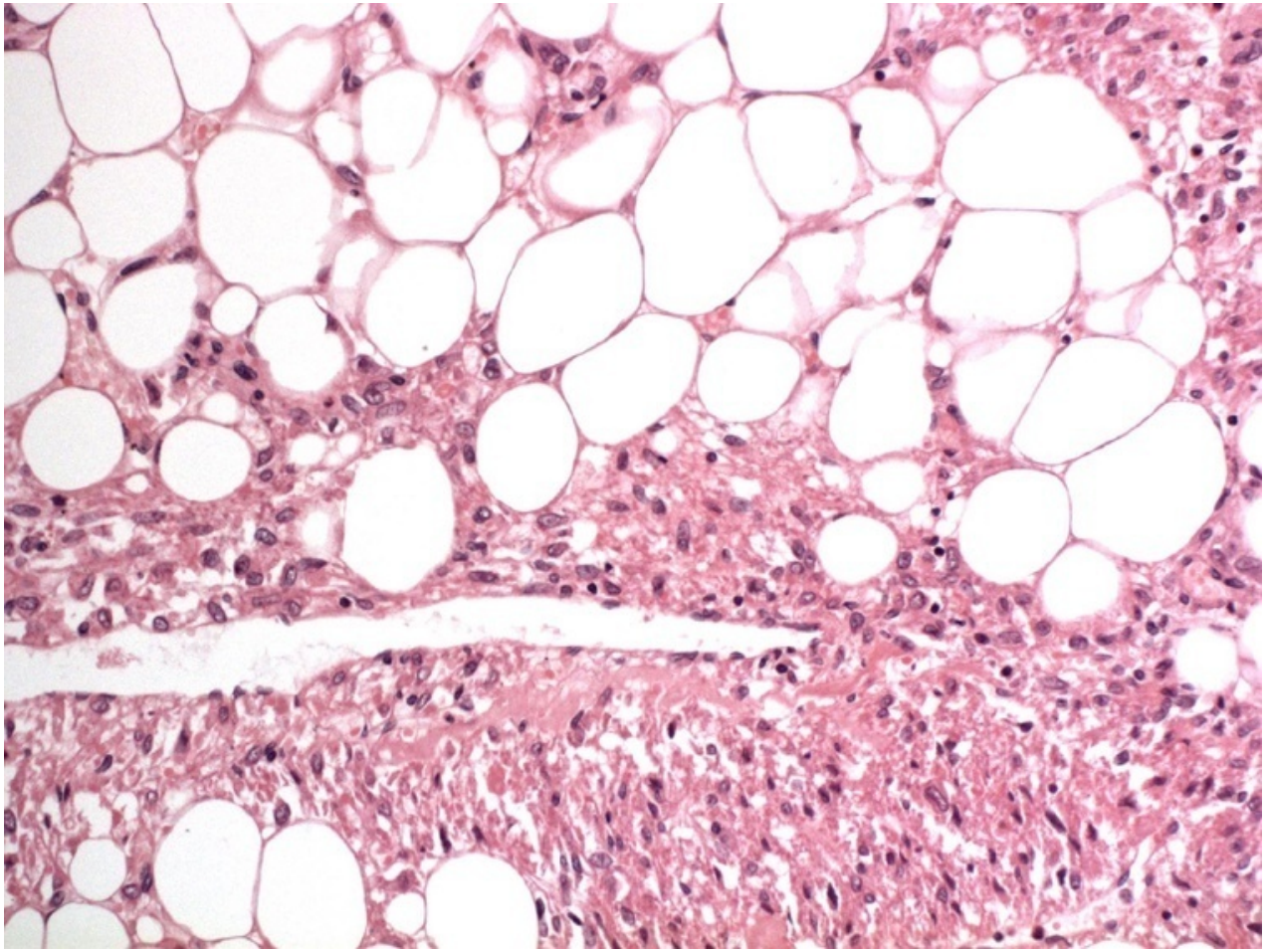
- Consider metastasis if tumour morphology not typical for site and infiltrative pattern
- Consider UC with squamous differentiation arising in the renal pelvis
- Need clinical information

K12

- Female 62 yrs
- Emergency nephrectomy for bleeding from mass right solitary kidney



K12



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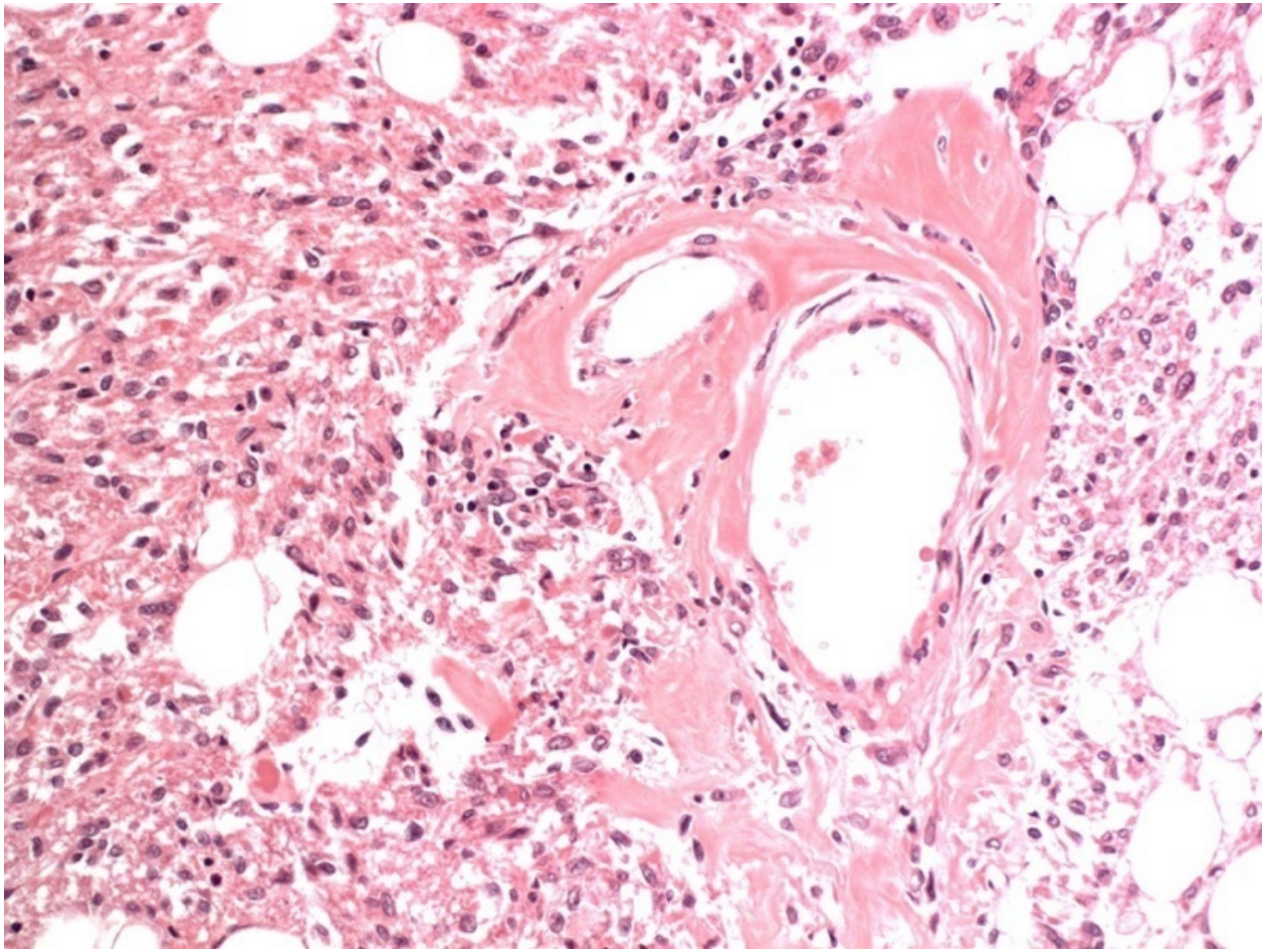


K12

- **Angiomyolipoma**
  - Male: female = 1:3
  - Association with Tuberous Sclerosis – especially if multiple (>50% have AML), young age; TSC1 and TSC2 gene alterations
  - Sporadic: <50% with AML have TS
  - IHC: HMB45+ Melan-A + Actin-SM+ H-caldesmon+
  - May see vascular invasion or lesions in LNs (still benign behaviour)
  - Nuclear atypia in muscle

K12

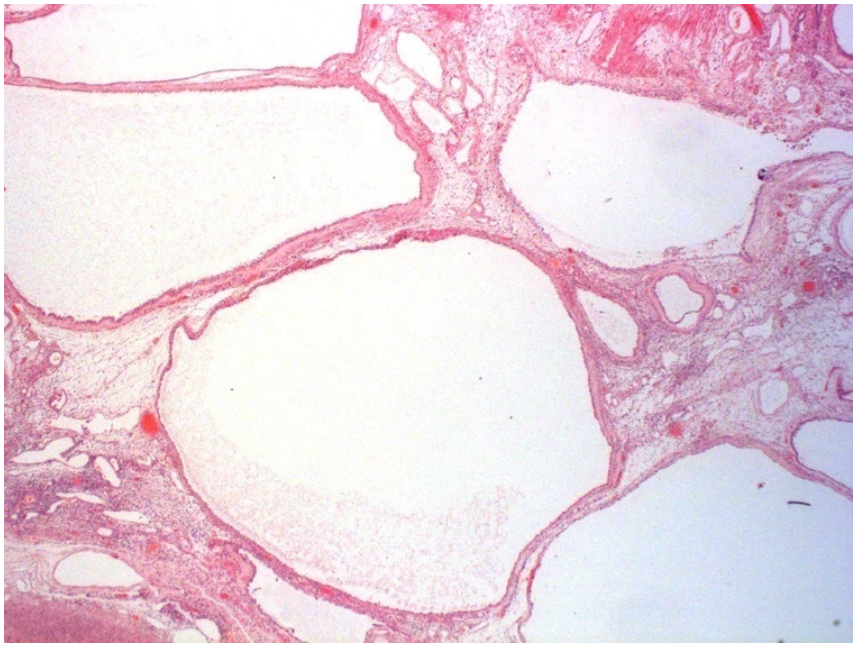
DD

- Liposarcoma (usually extra-renal)
- Leiomyoma/leiomyosarcoma (rare)
- Sarcomatoid RCC
- Epithelioid AML – 80% epithelioid cells for this designation – potentially malignant

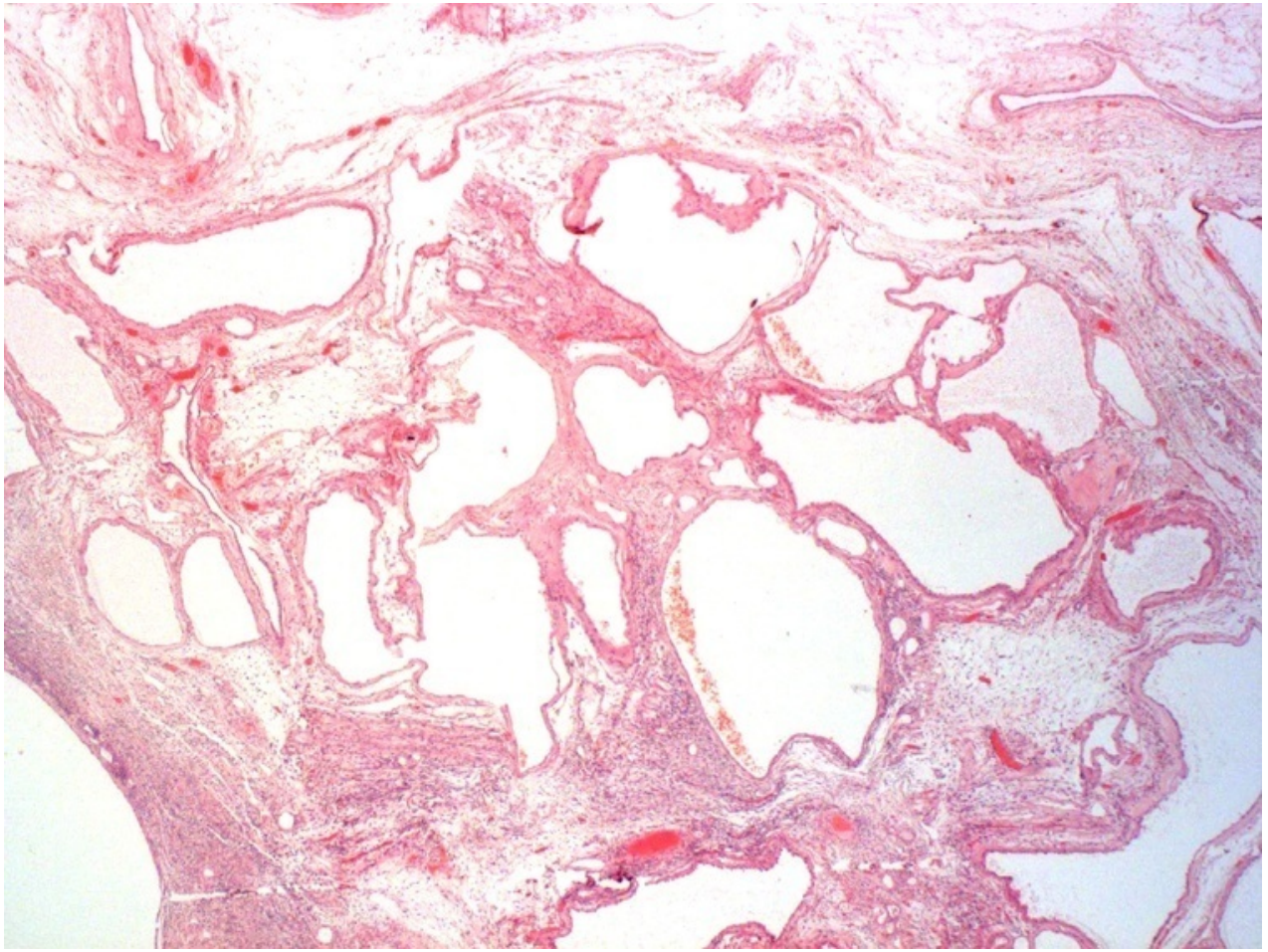
- Complication - haemorrhage

K14

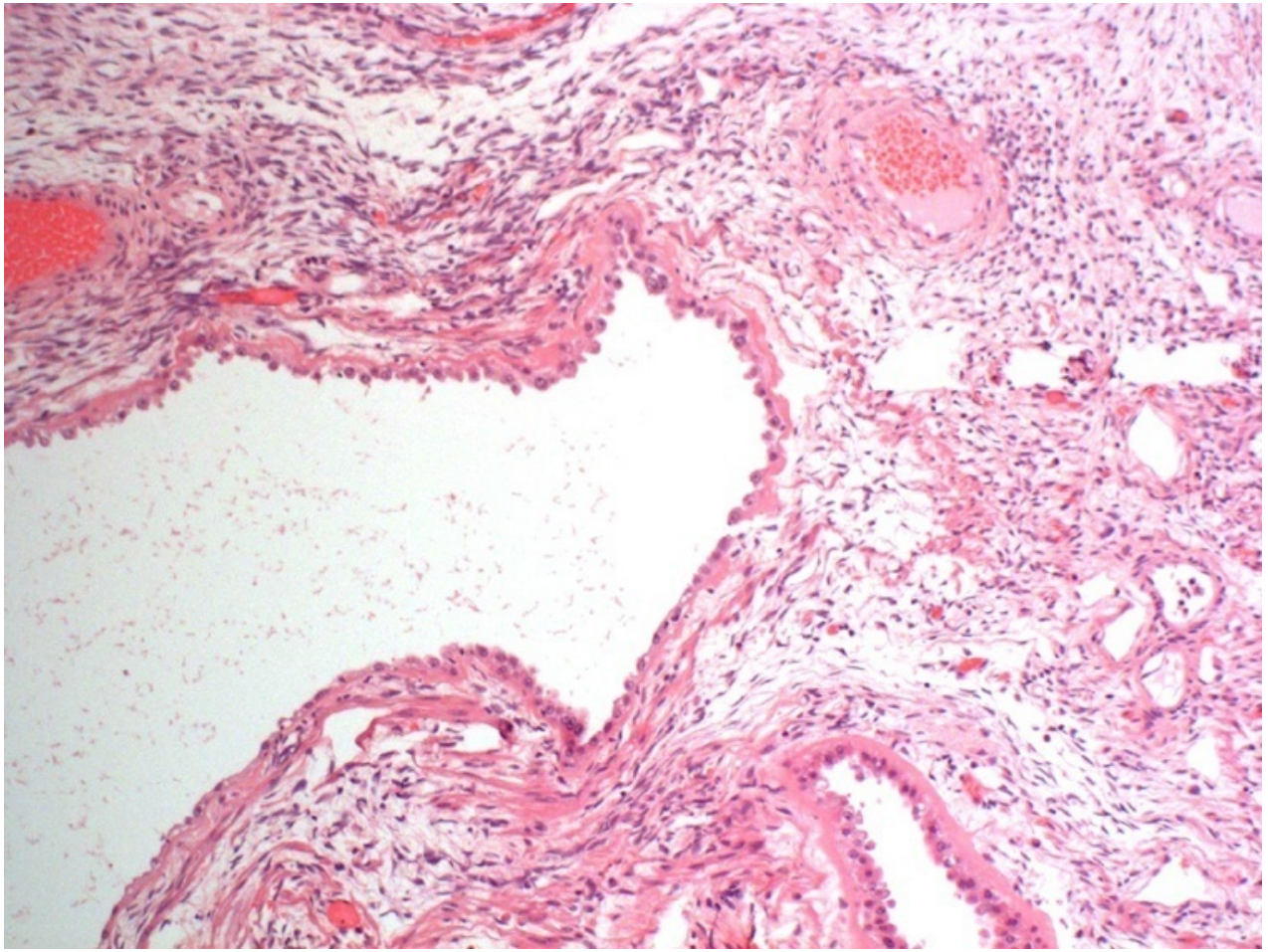
- Female 57yrs
- Nephrectomy for renal cystic mass



K14



K14



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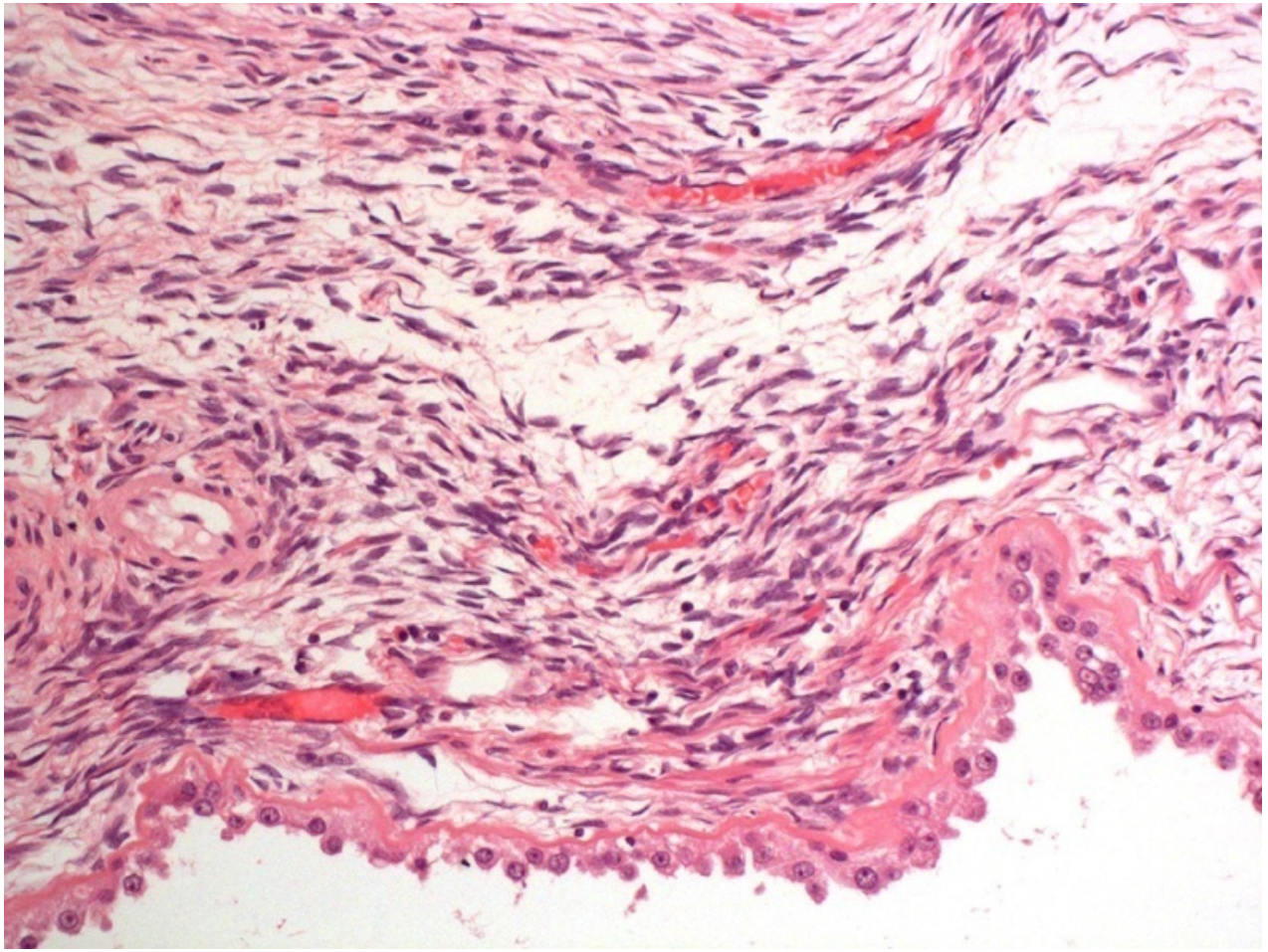
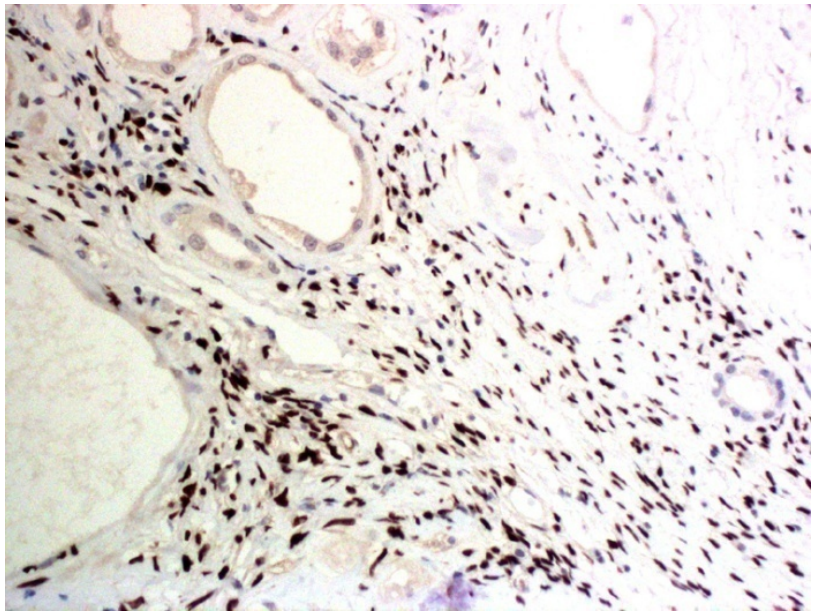


K14

- PR+



K14

Adult cystic nephroma

- Female >> male
- Long term oestrogen replacement association
- Benign

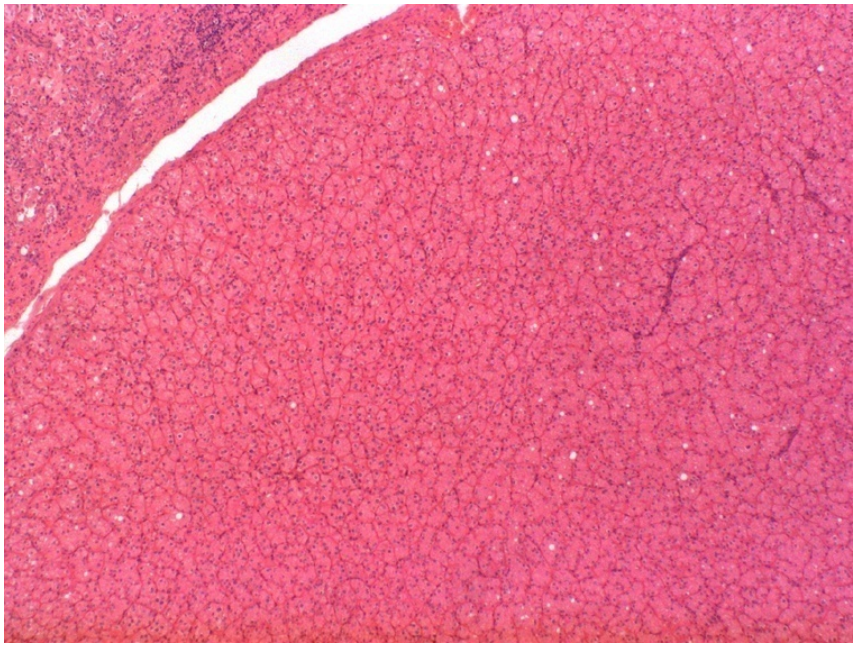
- Sharply demarcated
- Ovarian like stroma (ER+ PR+)
- Hobnail cyst lining cells (clear or acidophilic)
- Small tubules in septae

DD

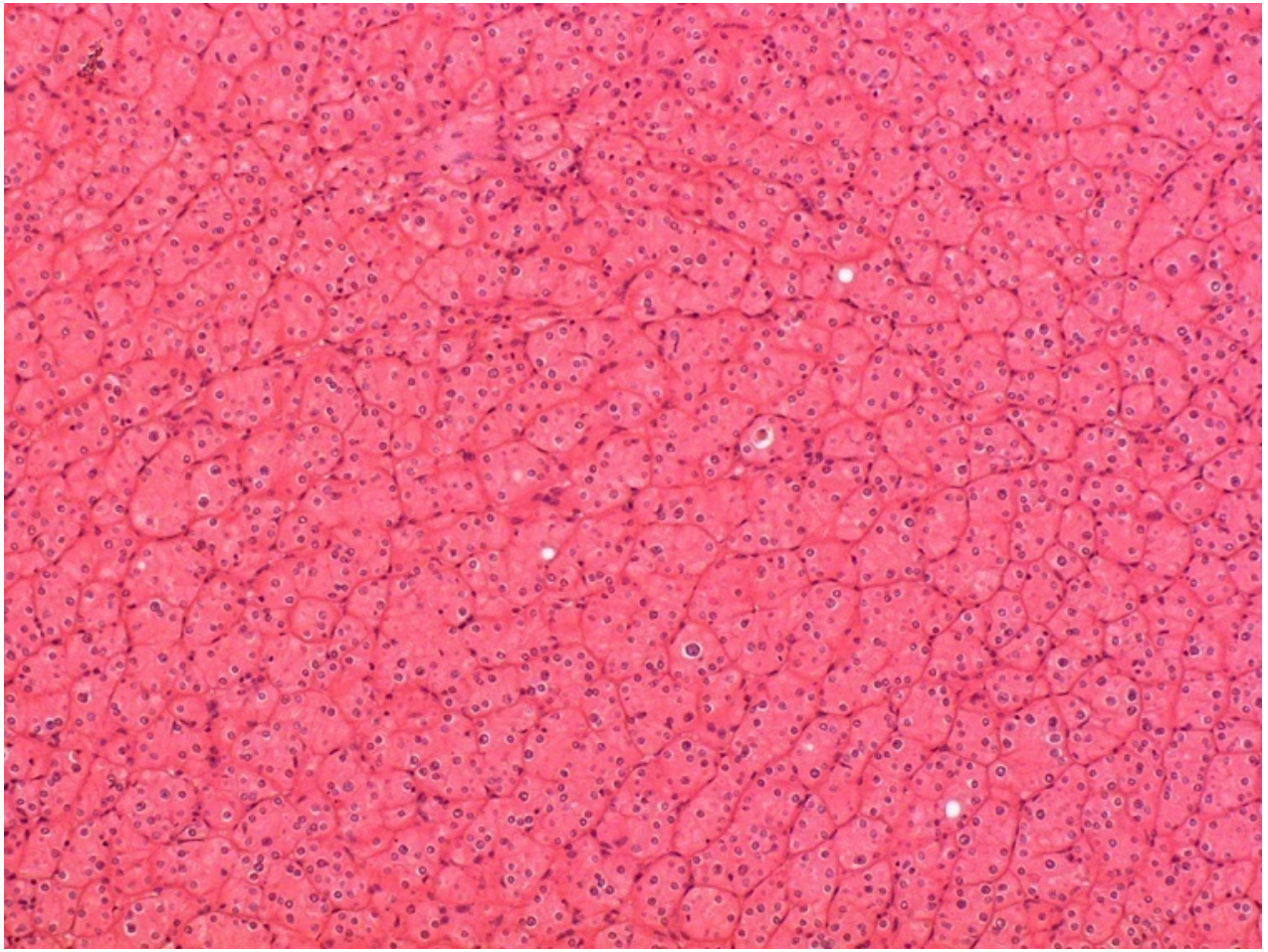
- Multilocular cystic RCC
- Tubulocystic carcinoma
- Non-neoplastic renal cystic conditions (nephron remnants in septae)

K16

- Female 55 yrs
- Right partial nephrectomy for renal mass



K16



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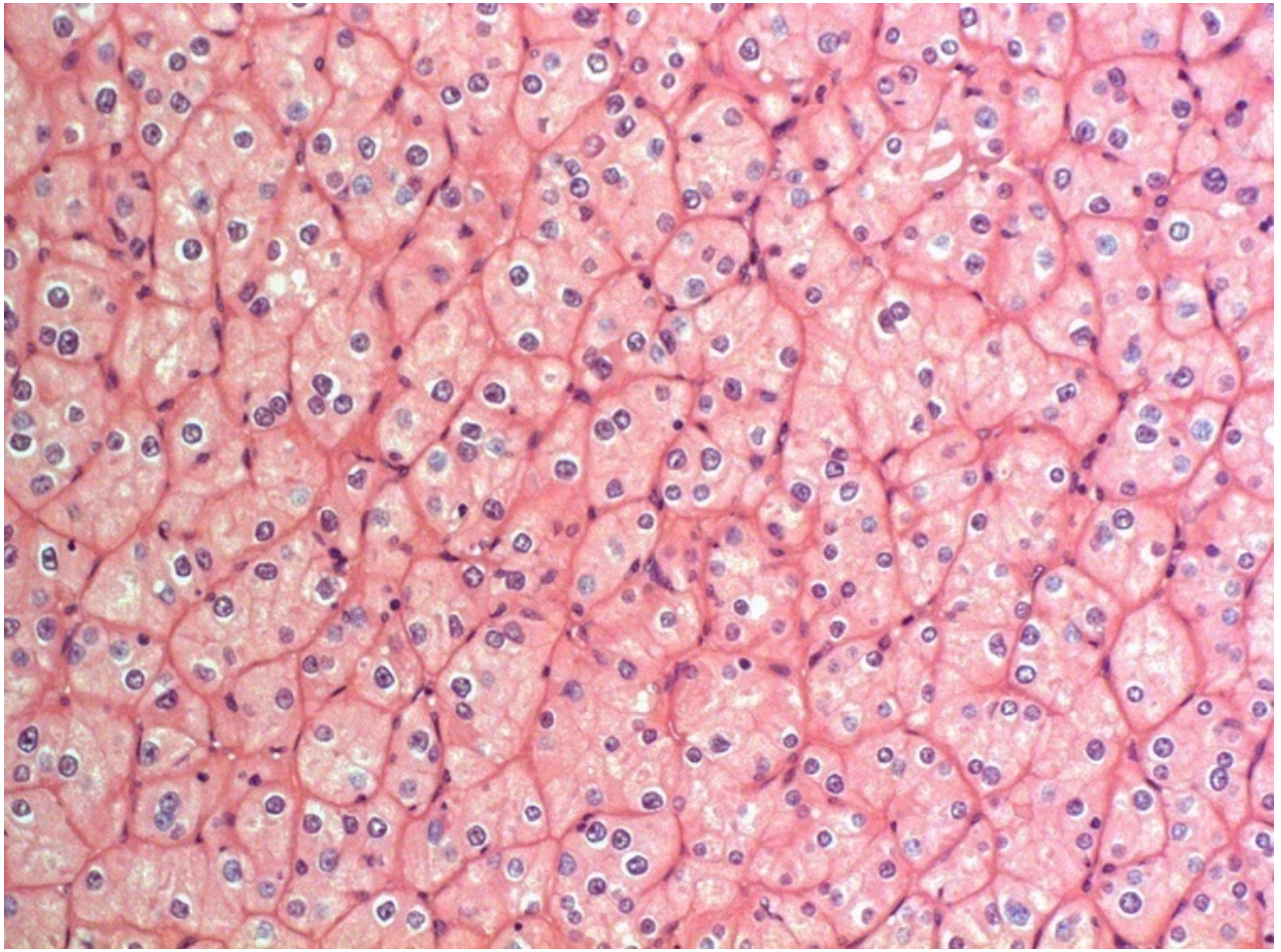

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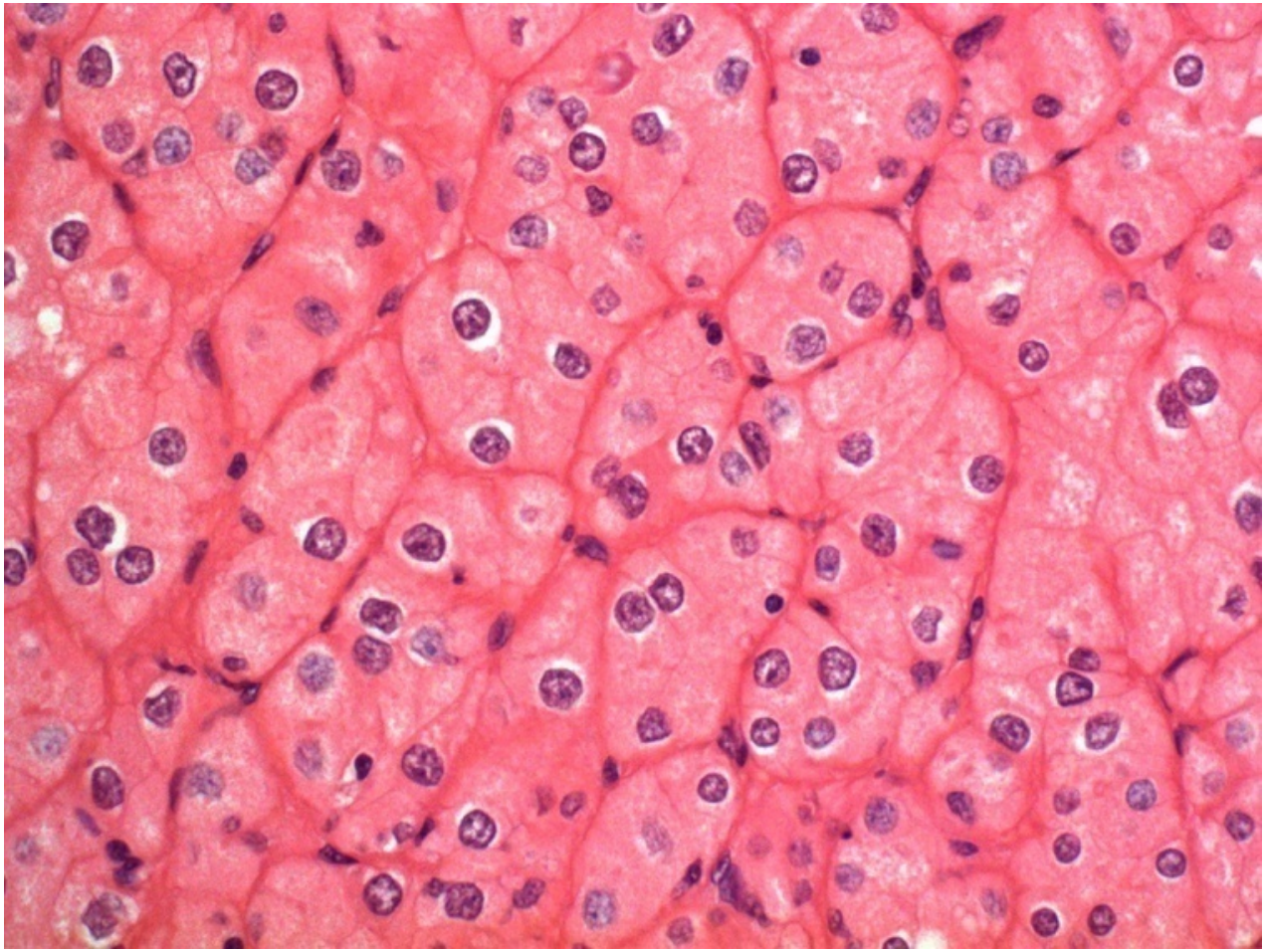


K16

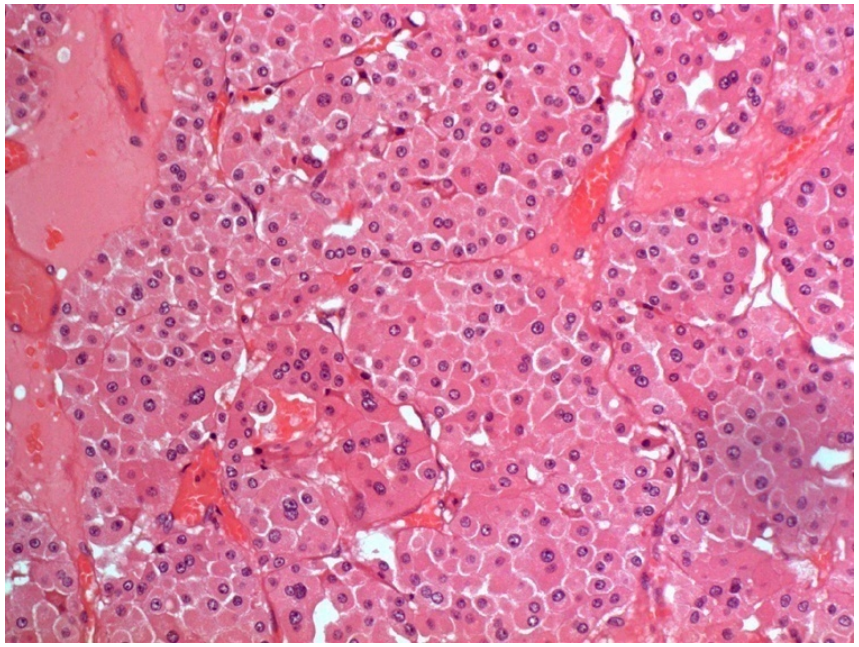
Eosinophilic chromophobe renal cell carcinoma

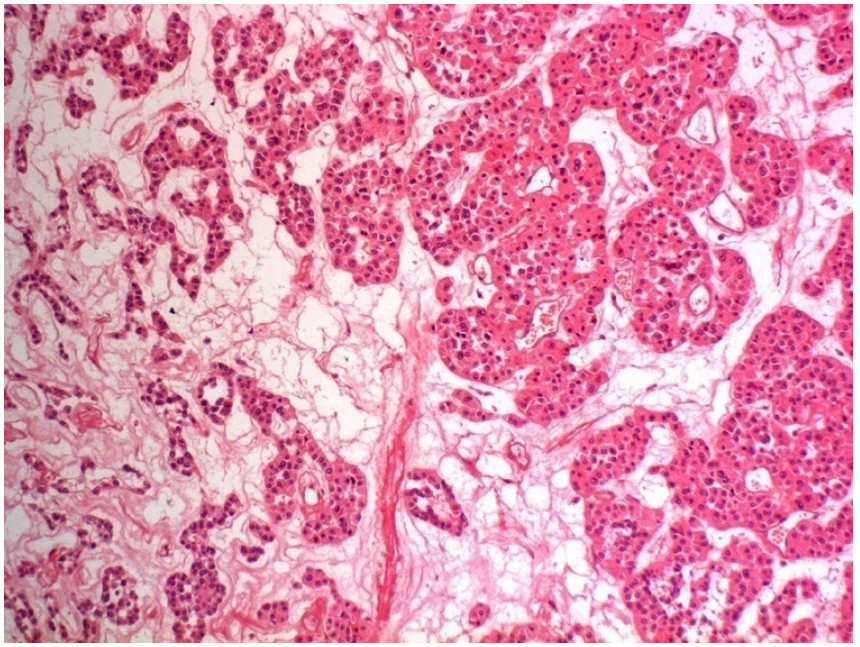
- Solid architecture
- Eosinophilic cytoplasm
- Binucleate cells
- Perinuclear haloes
- WHO/ISUP grade not appropriate
- May show sarcomatoid change
- IHC: CK7 diffusely and strongly positive
  - » CD117+ CD10+/- CAIX- Vimentin- RCC-
- Hale's colloidal iron +

DD

- Oncocytoma (CK7 only occasional cells +)
- Clear cell RCC (CK7- CA-IX+ CD10+ Vimentin+)

Oncocytoma



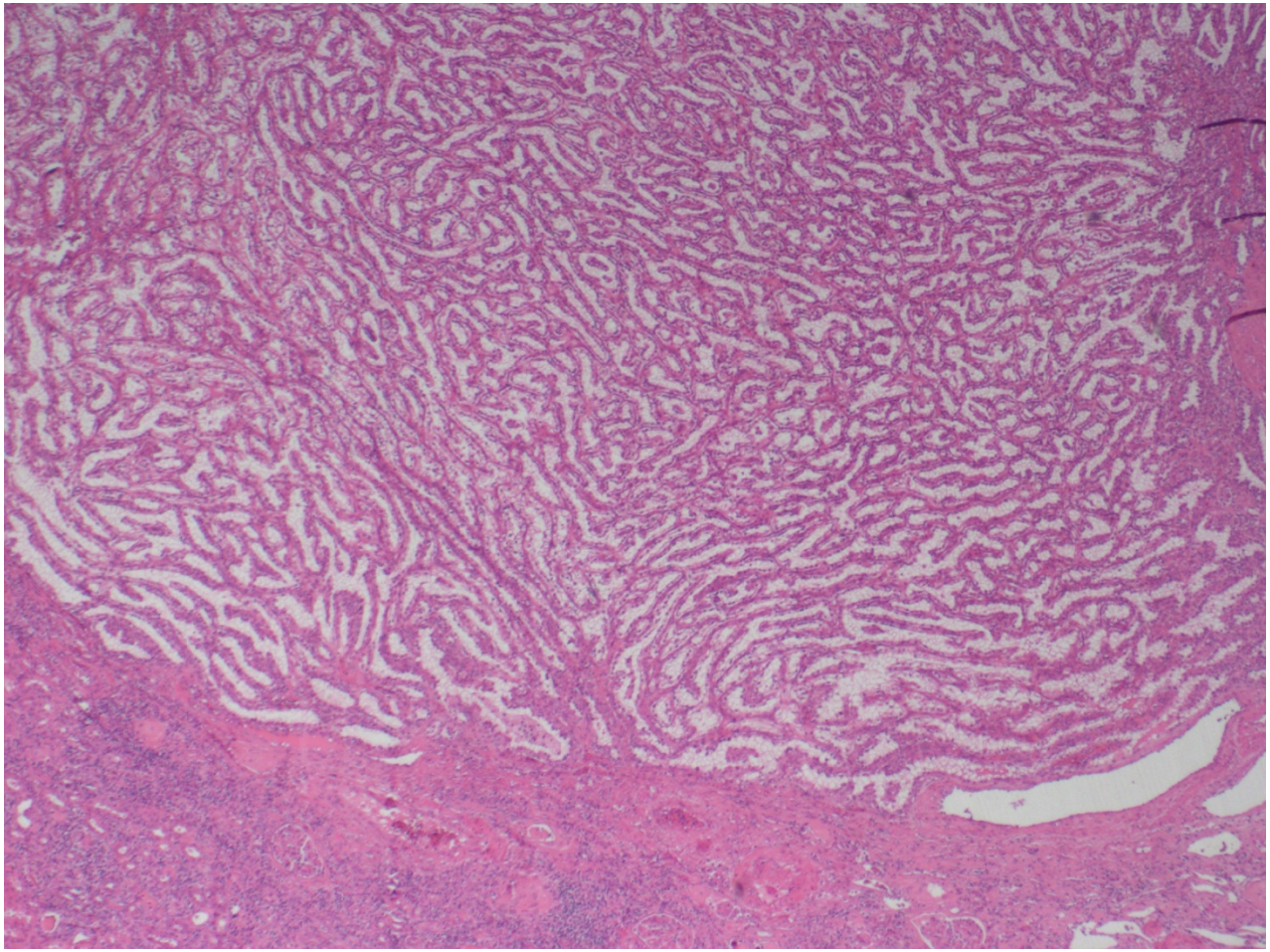


K38

Female 50 years
Small left renal mass

Partial nephrectomy

K38



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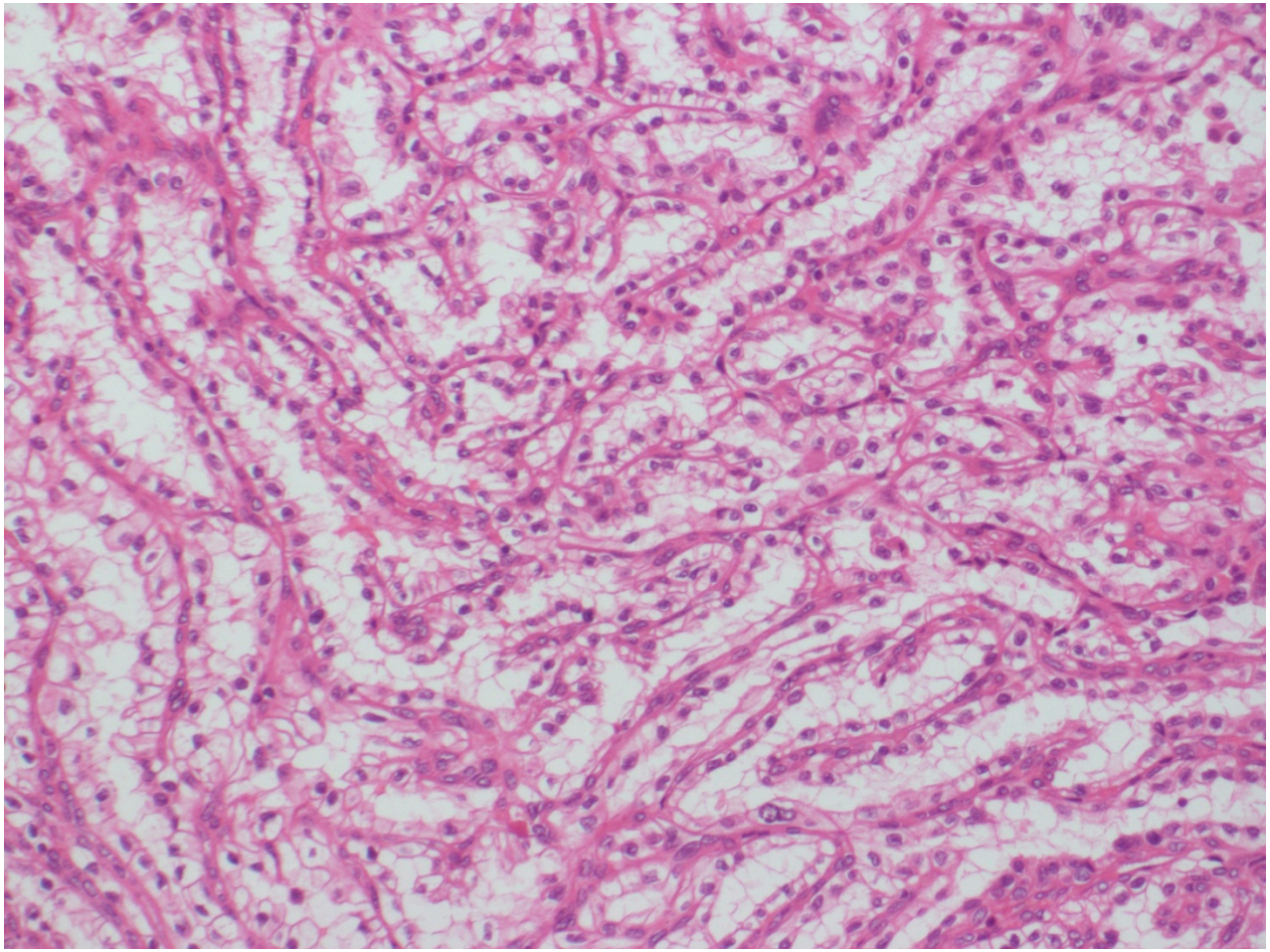

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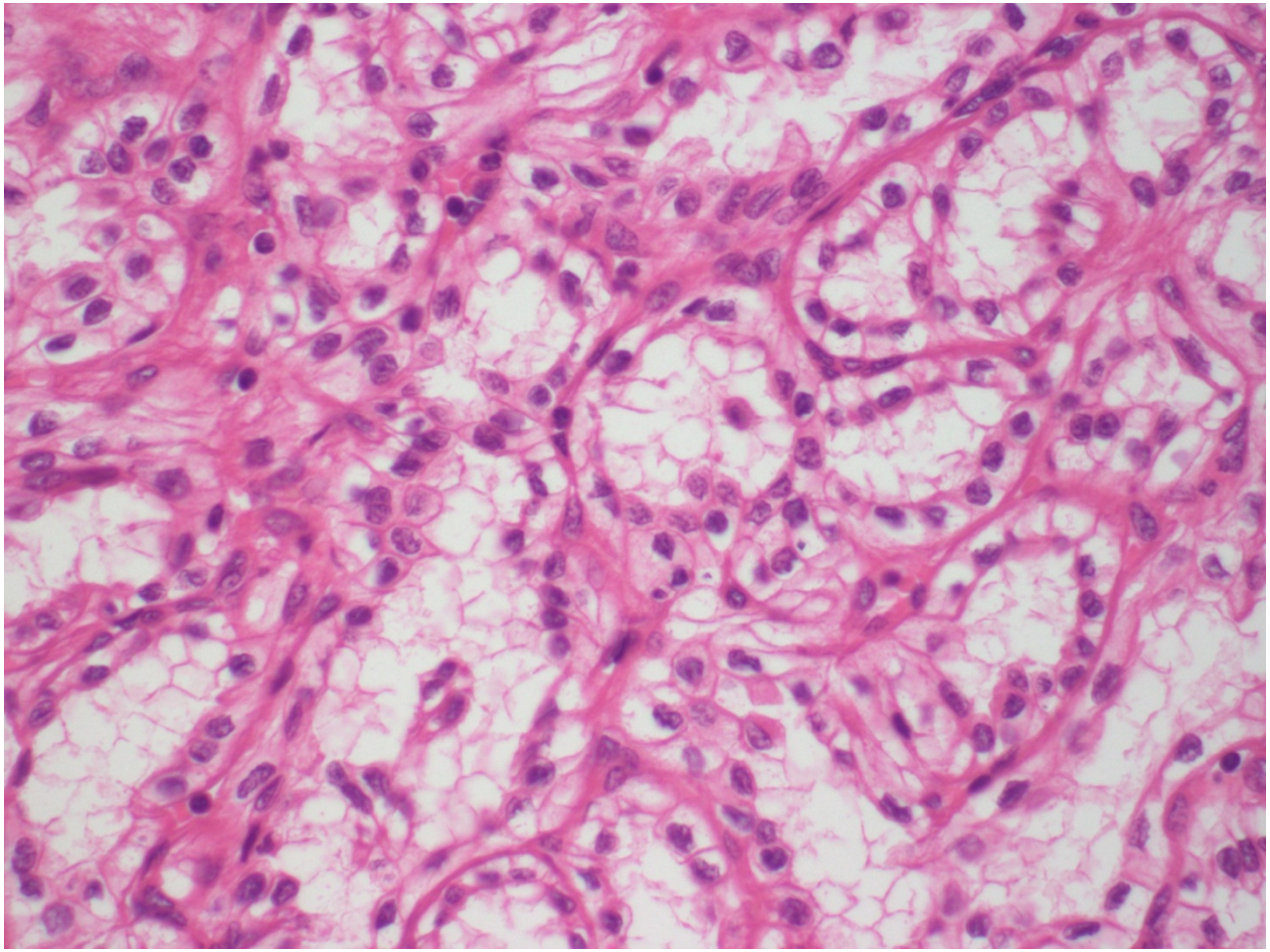
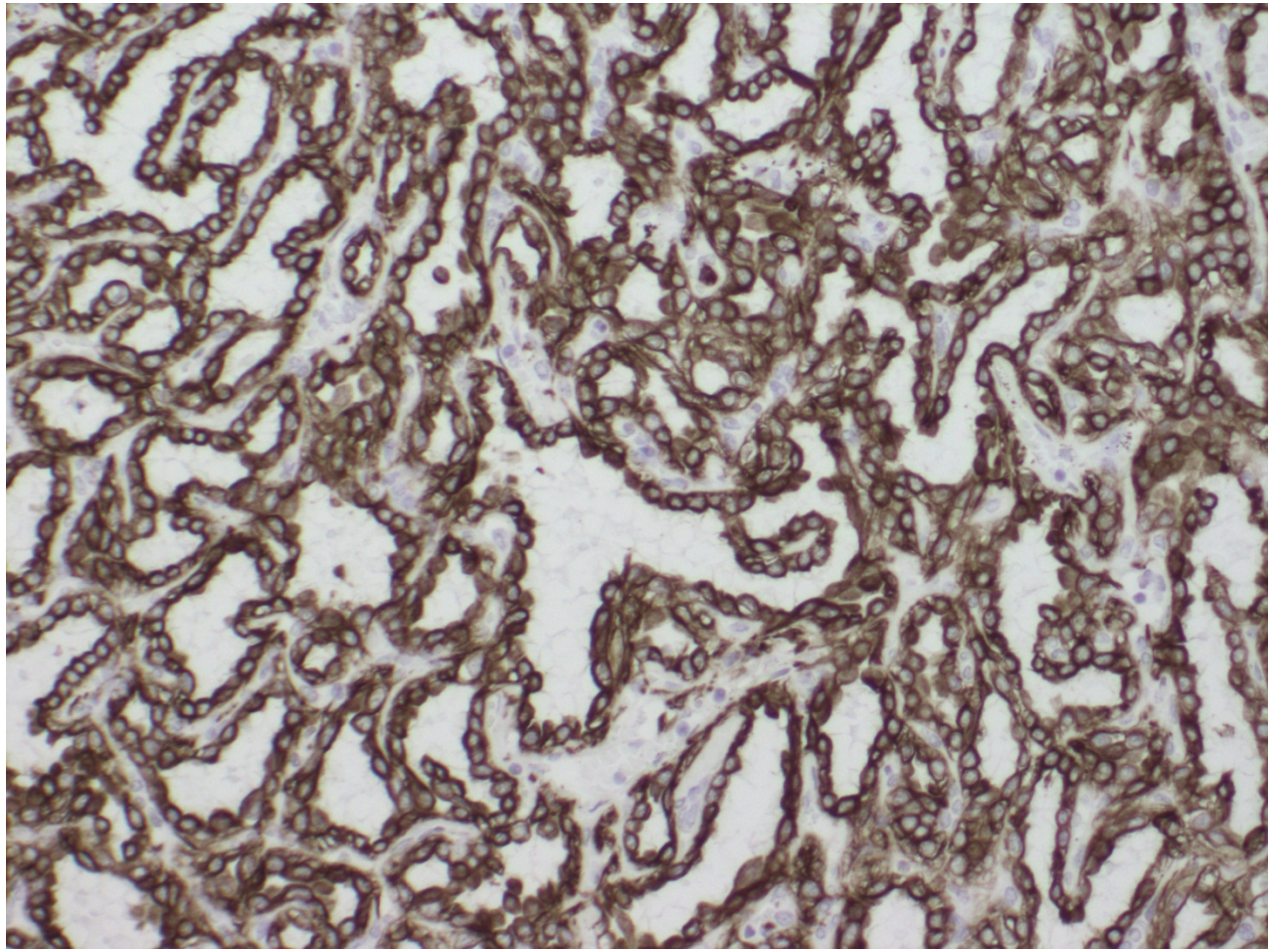
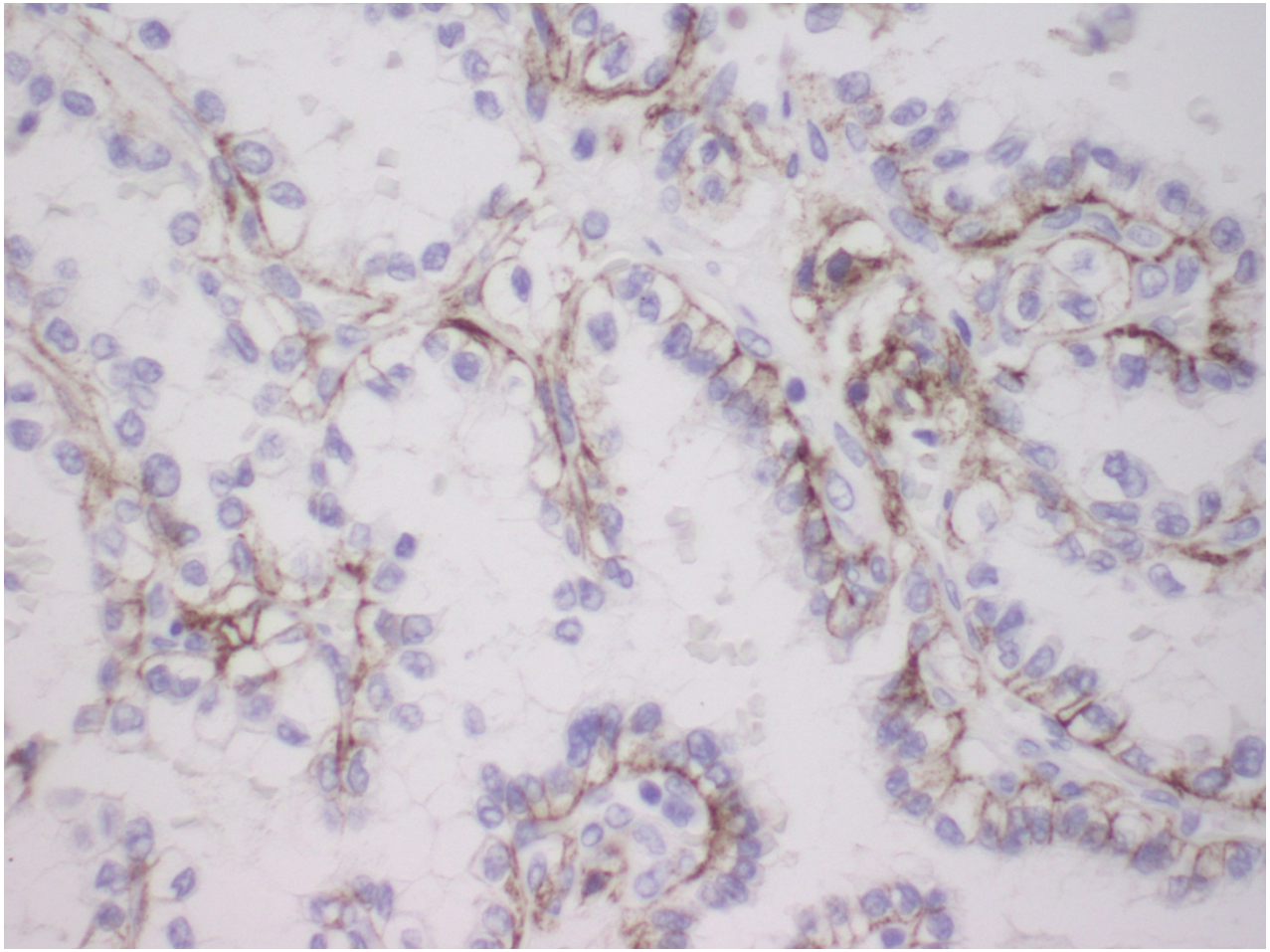


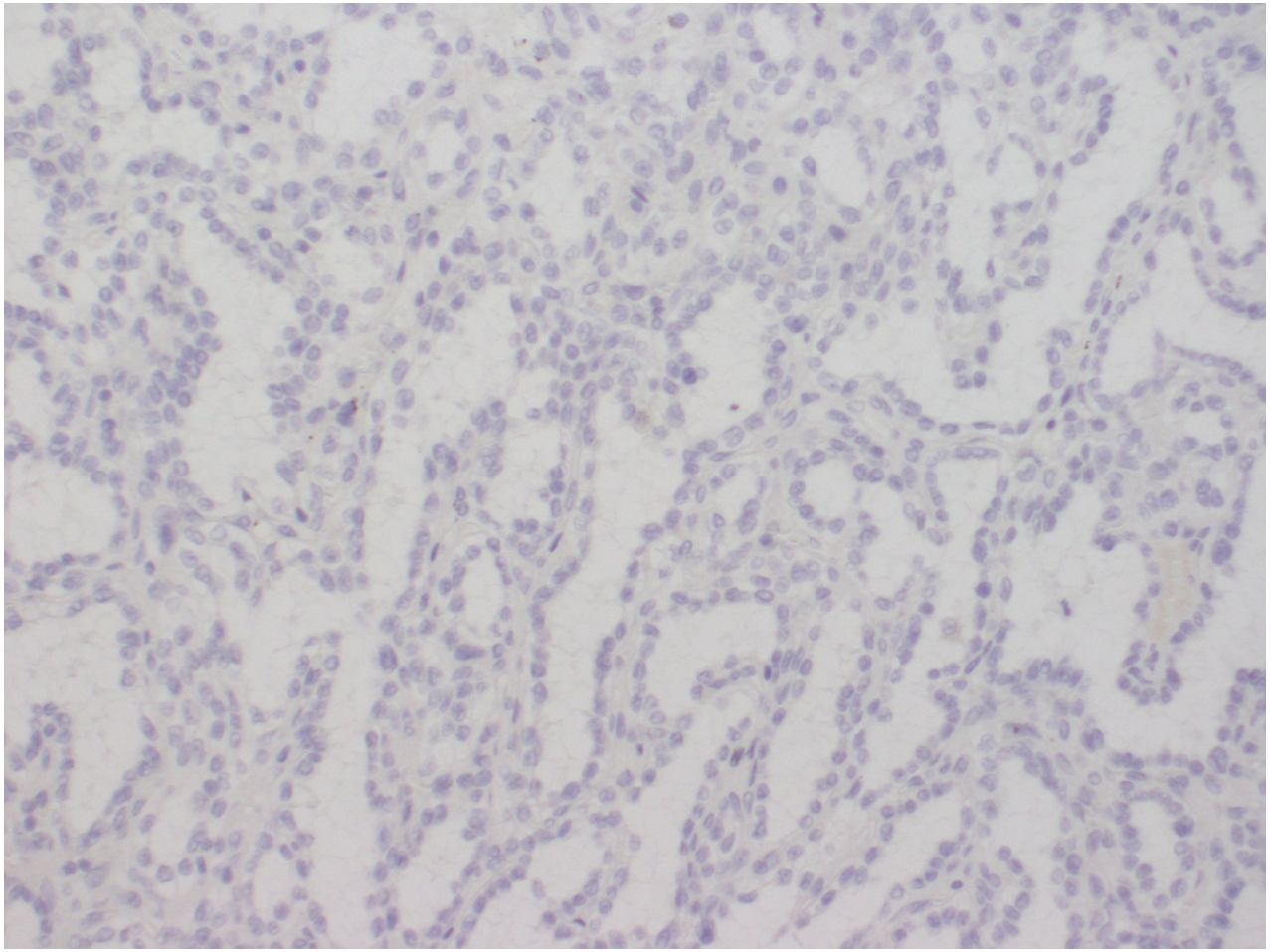
K38 – CK7



K38 - CAIX



K38 – AMACR



K38

Clear Cell Papillary RCC

- Tubular, papillary, cystic
- Bland cells, low grade
- Nuclei – linear, away from basement membrane
- IHC: CK7 +, AMACR -, CAIX + (cup-shaped), 34BetaE12 +

- 4th most common renal RCC
- Sporadic, end-stage renal disease, von Hippel-Lindau
- Indolent behaviour

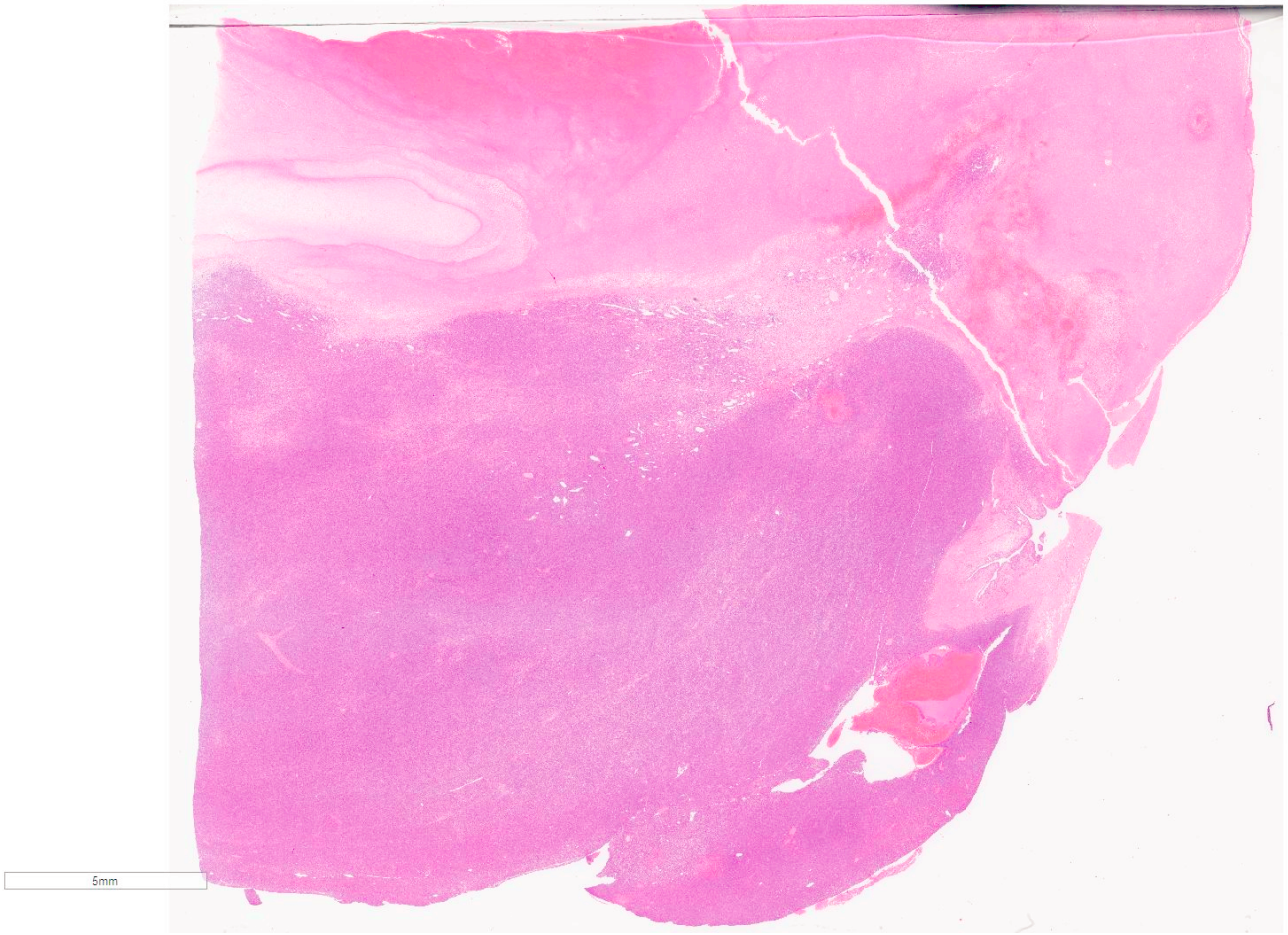
- DD
  - Clear cell RCC
  - Papillary RCC

K34

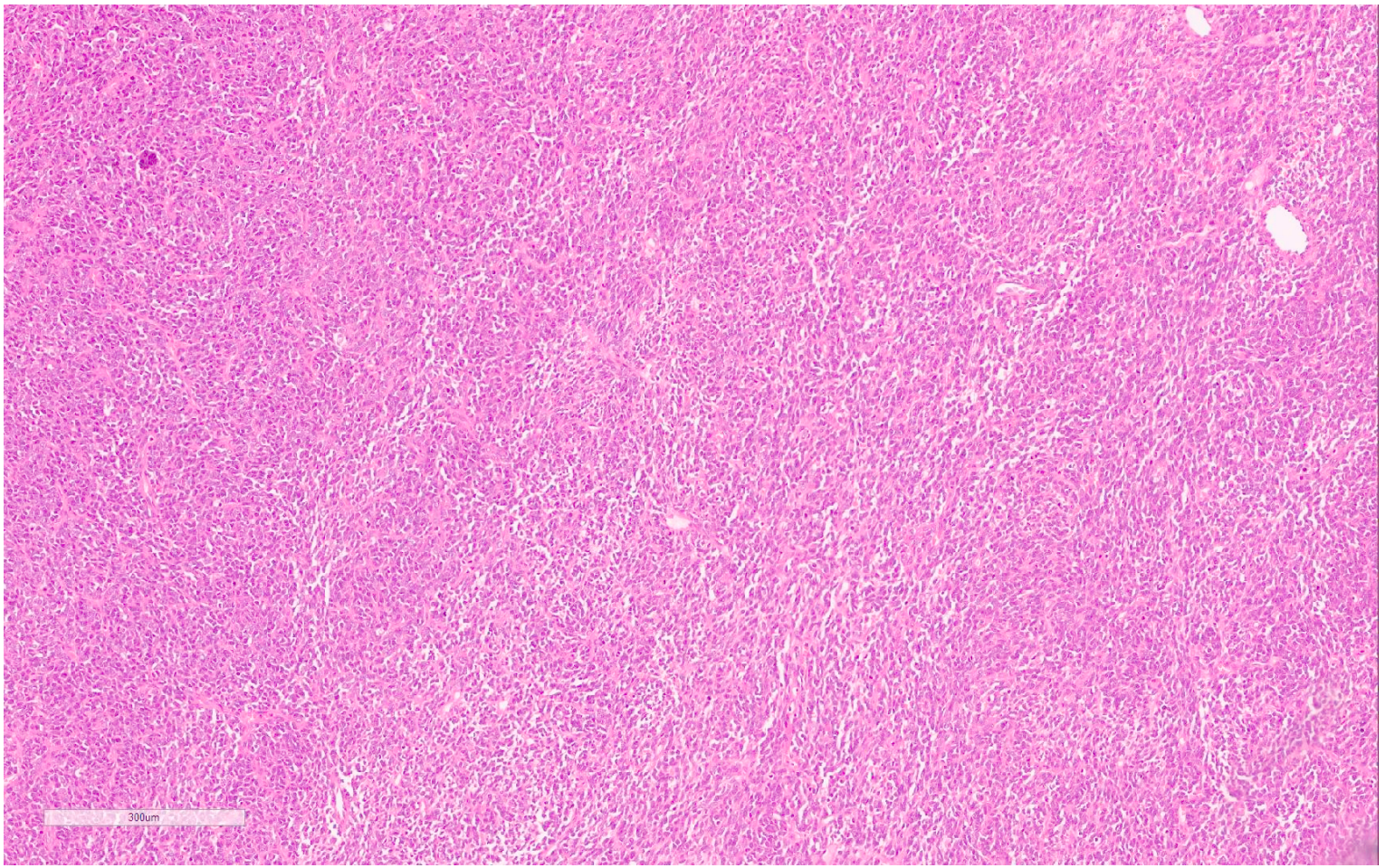
Male, 74 years
Right nephrectomy for renal mass

White irregular tumour 45mm
Gross extension of tumour into renal vein

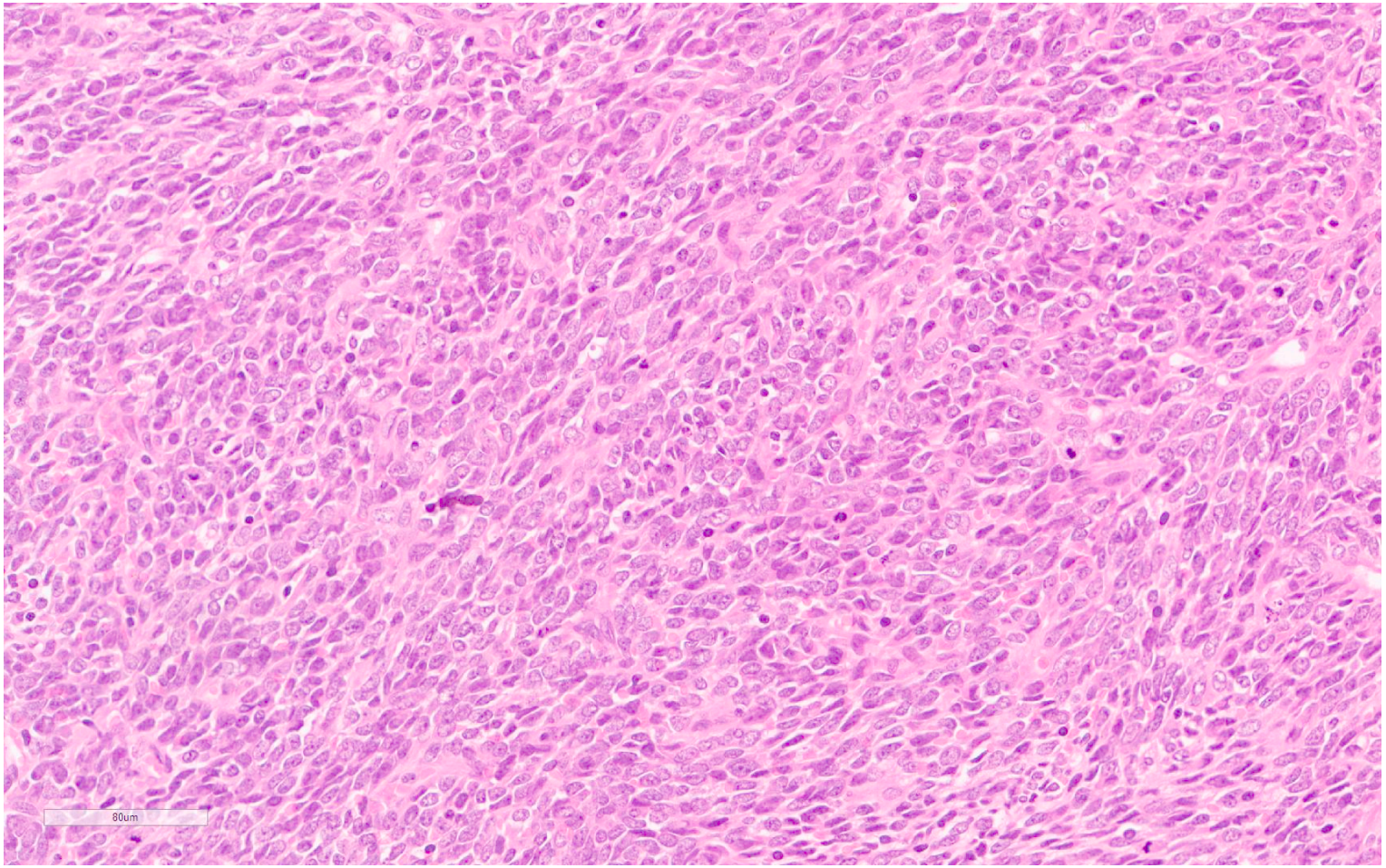
K34



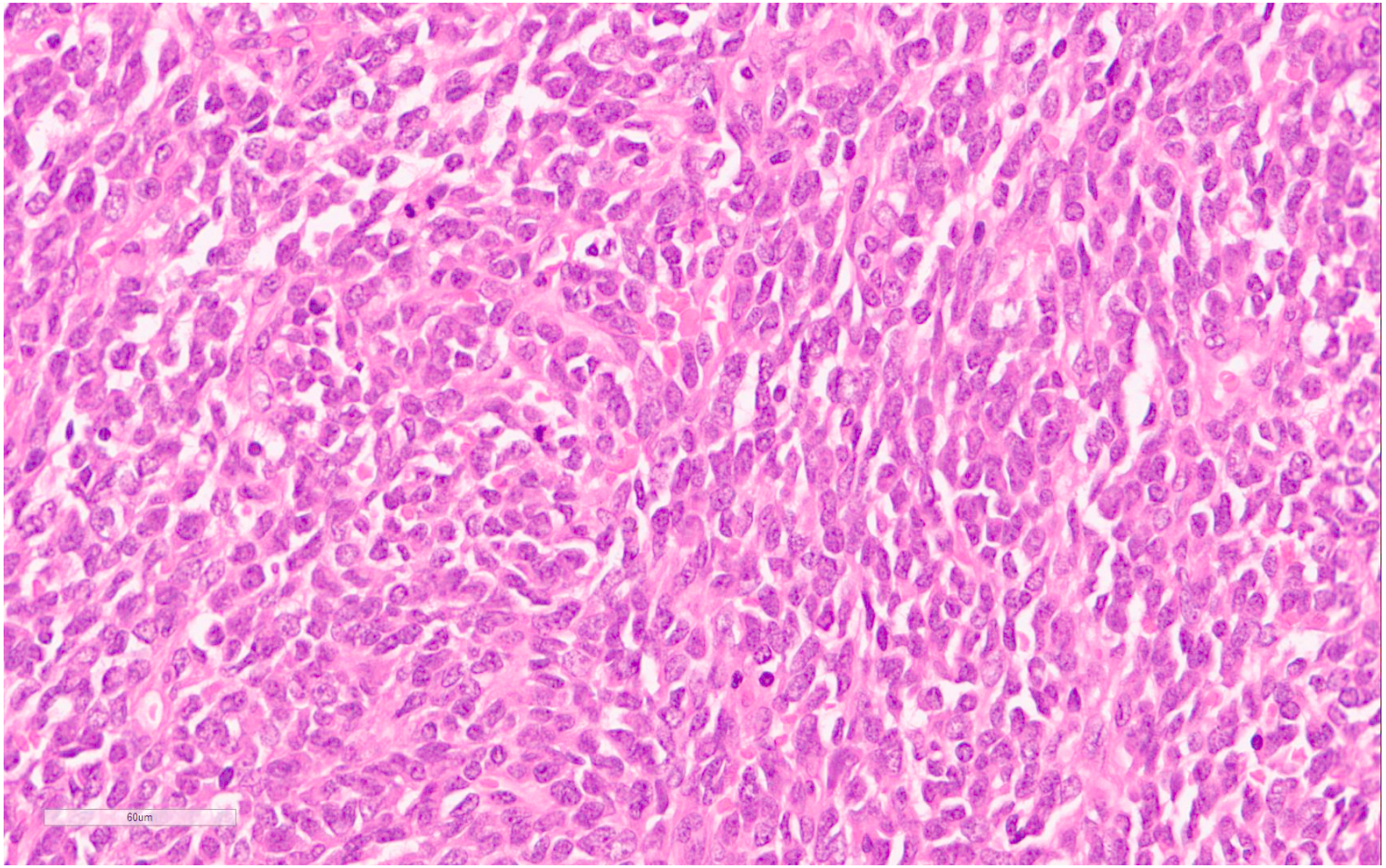
K34



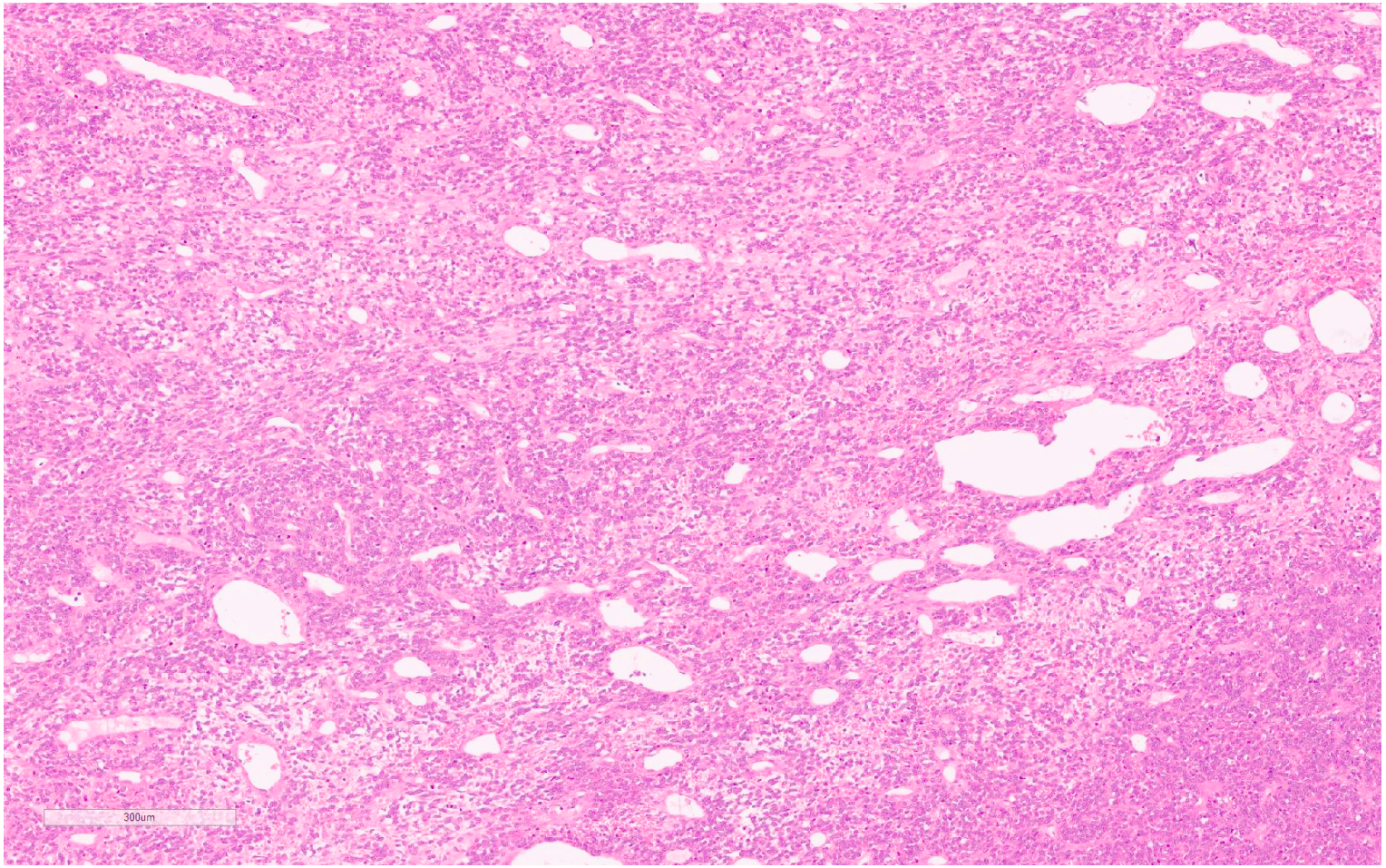
K34



K34



K34



K34

Synovial sarcoma

IHC

- Vim+ CD56+ BCL-2+ Focal + : Pan CK, EMA ,MUC-1
- CD99 +/-
- Negative: CrGA, Synap, S100, Desmin, CD34, Mel-A, WT-1
- MIB-1 60%

FISH

- T(X;18)(p11.2;q11.2) SS18 gene on 18q11.2

K34

Rare high grade primary renal sarcoma

- Young/middle aged
- Aggressive
  - Approx 1/3 develop mets in follow-up
  - Lung, abdominal, LNs, liver, bone

DD:

- RCC with sarcomatoid change
- Solitary fibrous tumour
- MEST
- PNET

(Schoolmeester; Am J Surg Path 2014)

Renal cell carcinoma: WHO/ISUP Grading System

The WHO/ ISUP grading system for clear cell and papillary RCC.

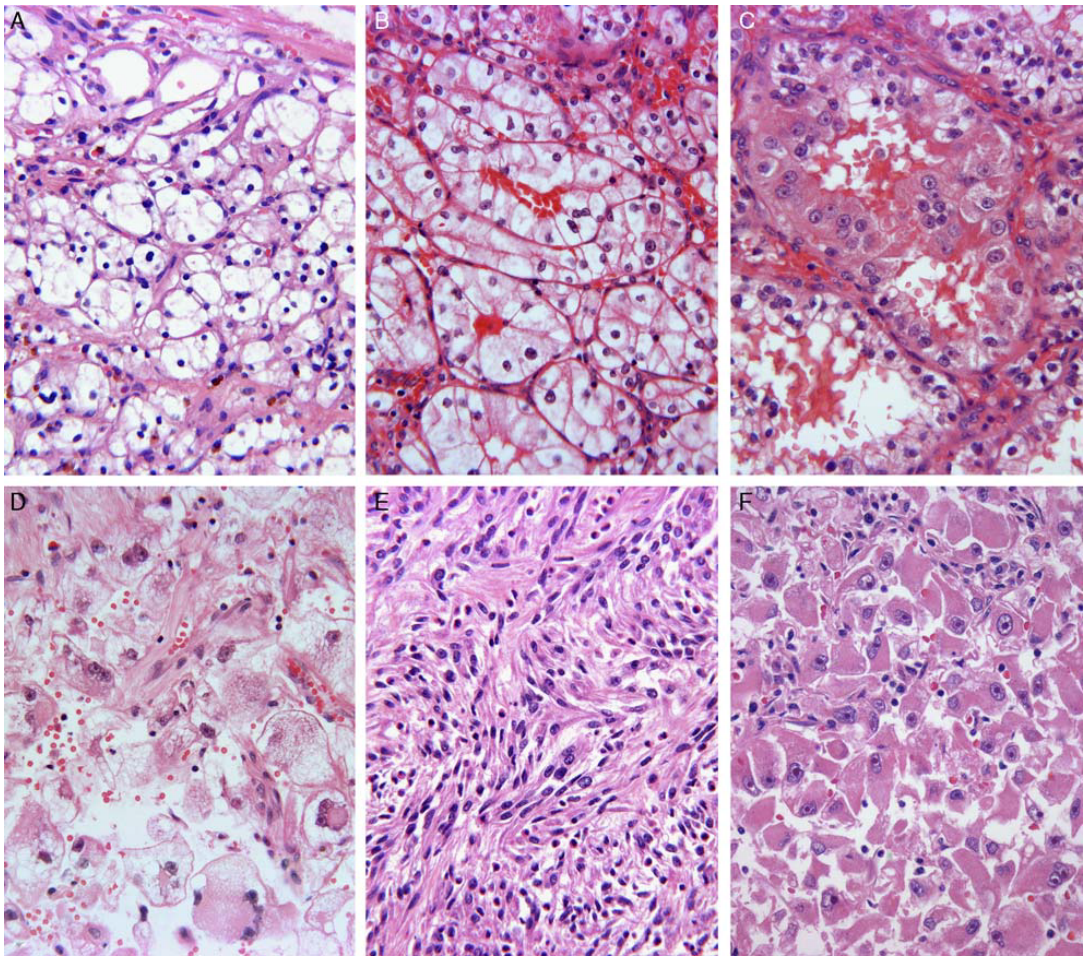
Grade 1: nucleoli are inconspicuous or absent.

Grade 2: eosinophilic nucleoli are clearly visible at high-power magnification but are not prominent.

Grade 3: eosinophilic nucleoli are prominent and are easily visualised at low-power magnification.

Grade 4: presence of tumor giant cells and/or marked nuclear pleomorphism – and sarcomatoid and/or rhabdoid morphology.

Renal cell carcinoma: WHO/ISUP Grades



Delahunt et al. Am J Surg Pathol Volume 37, Number 10, October 2013

Good luck and thank you for listening!