

ONCO-NEPHROLOGY

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INTRODUCTION



- Kidney disease and cancer have a multifaceted association
- Persons with chronic kidney disease (CKD) have an increased incidence of cancer relative to patients without CKD
- Both cancer and cancer treatments can cause impaired kidney function, including acute kidney injury (AKI) or CKD



INTRODUCTION

- CKD is highly prevalent in cancer patients
- Certain cancers, such as RCC and bladder cancer have a higher prevalence of CKD than others
- It is critical for nephrologists to be knowledgeable of cancer biology and therapy in order to be fully integrated in the multidisciplinary team and optimally manage patients with cancer and kidney diseases

Onco-Nephrology

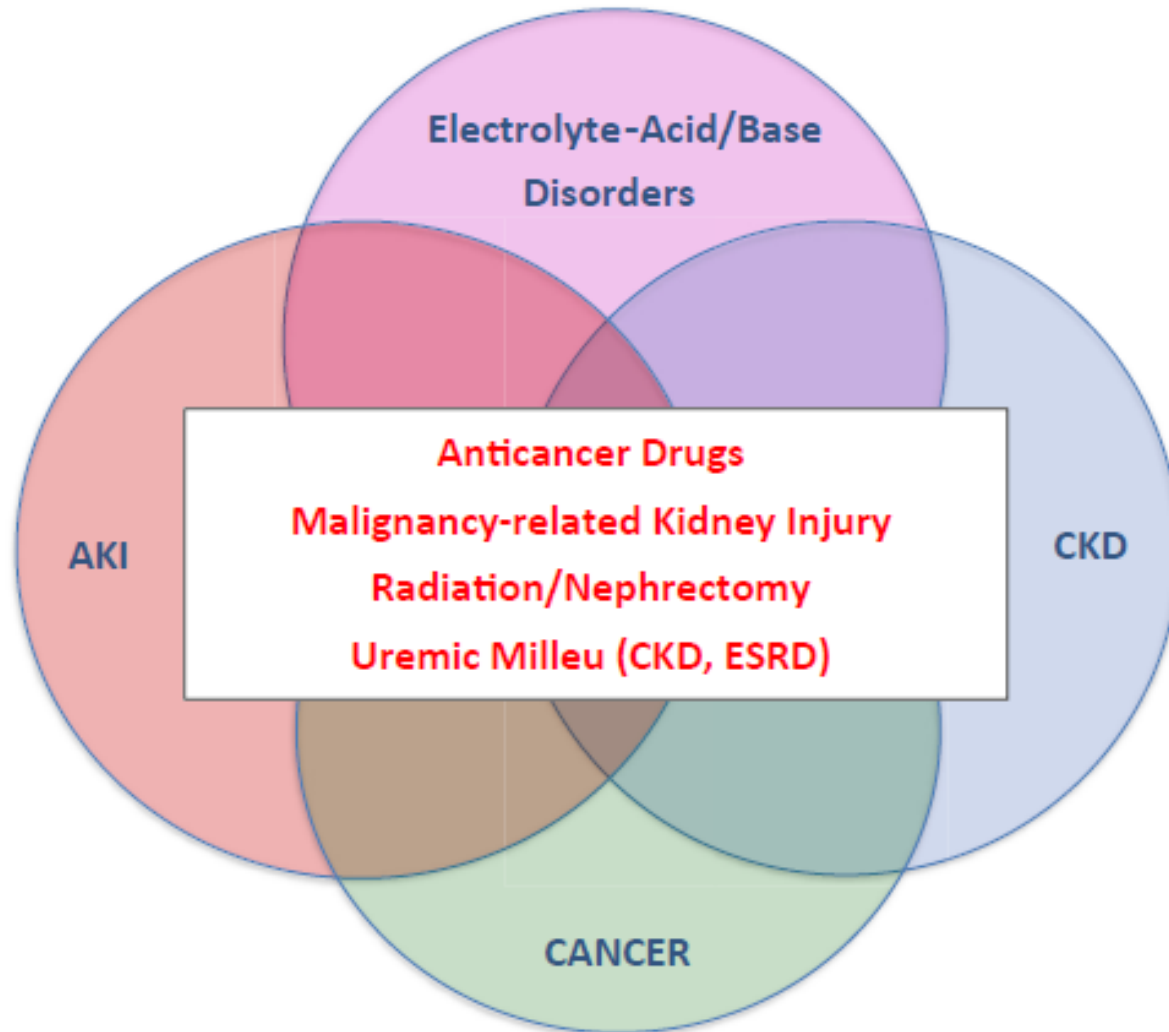


Figure 1 | The kidney disease–cancer connection. AKI, acute kidney injury; CKD, chronic kidney disease; ESRD, end-stage renal disorder.



ASSESSMENT OF KIDNEY FUNCTION

- CKD-EPI equation is the current best approach for dosing chemotherapeutic agents in patients with CKD



CANCER IN SOLID ORGAN TRANSPLANT

- Immunosuppressive drugs may have direct effects on the development of particular types of cancer

GLOMERULAR DISEASES ASSOCIATED WITH CANCER



- Membranous nephropathy is the most frequent cancer-associated glomerulonephritis
- Minimal change disease and focal segmental glomerulosclerosis are also associated with solid tumors
- RPGN can develop in patients with RCC, gastric cancer, and lung cancer



NEPHROTOXICITY FROM CHEMOTHERAPY

Patient's Risk factors :

- Patient's age
- Intravascular volume depletion
- Presence of underlying AKI or CKD



NEPHROTOXICITY FROM CHEMOTHERAPY

kidney manifestation:

- Acute interstitial nephritis
- Focal segmental glomerulosclerosis
- Hypertension
- Various electrolyte disorders
- Capillary leak syndrome
- Thrombotic microangiopathy (TMA)



ELECTROLYTE DISORDERS IN PATIENTS WITH CANCER

- Hyponatremia
- Hypernatremia
- Hypercalcemia
- Hypokalemia
- Hyperkalemia
- Hypophosphatemia
- Hypomagnesemia



HYPONATREMIA

- Hyponatremia is the most common electrolyte disorder encountered in patients with cancer
- Hyponatremia is associated with increased mortality and poor response to therapy



HYPONATREMIA

○ Treatment

- Asymptomatic:
 - fluid restriction
 - tolvaptan 15 mg/day (contraindicated in volume depletion and anuria)
- Symptomatic:
 - 100–150 mL or 2 mL/kg hypertonic saline (NaCl 3%) i.v. 15–20 min for increasing serum sodium by 4–6 mEq/L within 1 h (max 3 times); then 8–12 mEq/L in 24 h



HYPERCALCEMIA

- Malignancy-associated hypercalcemia occurs in up to 10% of all patients with advanced cancer and generally conveys a poor prognosis
- The clinical features of hypercalcemia include nausea, vomiting, lethargy, renal failure and coma

Malignancy-Associated Hypercalcemia



Humoral
Hypercalcemia

PTHrp-related
paraneoplastic
syndromes

Examples:

- Squamous cell carcinoma
- Renal cell cancer
- Breast cancer
- Ovarian cancer
- Prostate cancer
- Lymphoma
- Leukemia

Osteolysis

Bony
metastases
and local
cytokine
activity

Examples:

- Breast cancer
- Multiple myeloma
- Lymphoma
- Leukemia

Rare Causes

Elevated
calcitriol levels
or ectopic PTH
secretion

Examples:

- Lymphoma
- Ovarian cancer
- Thyroid papillary cancer
- Pancreatic cancer

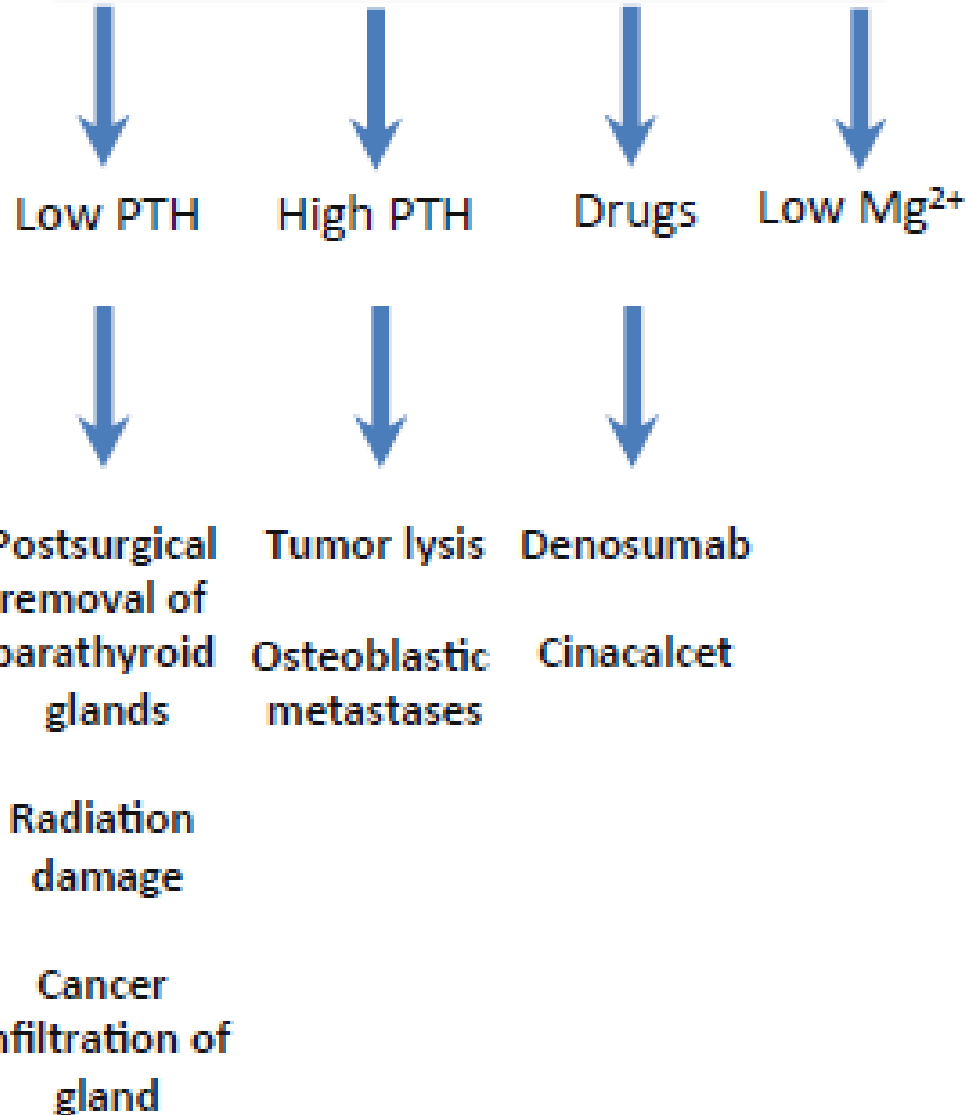


HYPERCALCEMIA

Treatment

- Volume expansion with isotonic saline (100–150 mL/h to ensure a urine output of 100 mL/h)
- Furosemide is not recommended
- Calcitonin 4-8 IU/kg s.c. every 6–12 h
- Pamidronate 60–90 mg i.v. over 2–6 h min)
- Zoledronate 4 mg i.v. over 15–30 min
- Corticosteroids
- Denosumab 120 mg s.c. weekly for 4 weeks and monthly
- Hemodialysis

Malignancy-Associated Hypocalcemia





TUMOR LYSIS SYNDROME

- Tumor lysis syndrome (TLS) is an oncological emergency characterized by a metabolic complication due to massive tumor cell lysis with release of large amounts of potassium, phosphate, and nucleic acids



TUMOR LYSIS SYNDROME

Prevention

- i.v. hydration (2–3 L/m²/per day)
- Diuretics use is contraindicated in patients with hypovolemia or obstructive uropathy
- Urinary alkalization is indicated only in patients with metabolic acidosis



TUMOR LYSIS SYNDROME

Treatment

– Hypouricemic agents

- Allopurinol
- Rasburicase
- Febuxostat

– Electrolyte abnormalities

- Hyperkalemia
- Hyperphosphoremia
- Asymptomatic hypocalcemia should not be treated
- Symptomatic hypocalcemia

ANTICANCER DRUG-RELATED NEPHROPATHIES



- Chemotherapeutic Agents
- Targeted Therapies
 - Anti-Angiogenic Agents
 - Immunotherapy
 - Immune Checkpoint Inhibitors



	Targeted therapies	Targeted therapies	Immune checkpoint inhibitors
	anti-VEGF, anti TKIs	BRAF, MEK, EGFR and ALK inhibitors	anti-PD1-PDL1/anti-CTLA-4 or associated of them
Proteinuria	x	x	
Arterial hypertension	x		
Acute kidney injury	x	x	x
Electrolyte disturbances		x	
Thrombotic microangiopathy	x		
Focal segmental glomerulosclerosis	x		x
Minimal change disease	x		x
Collapsing glomerulopathy	x		
Membranous nephropathy	x		x
Lupus-like nephritis			x
Pauci-immune glomerulonephritis	x		x
IgA nephropathy	x		x
Acute interstitial nephritis – acute tubular necrosis		x	x



CASE 1

- A 69-year-old Chinese male was hospitalized due to the symptom of edema for 3 months in November 2018
- Gross hematuria, 20 years' previous history of hypertension and no back pain
- blood pressure = 155/91 mmHg
- Laboratory examination:
 - Albumin: 22 g/L
 - Triglyceride: 1.85 mmol/L
 - Creatinine: 66 μ mol/L
 - GFR:35



CASE 1

- The total urine protein level was 24.8 g/24 h
- An abdominal enhanced computed tomography scan showed a 3.2 cm × 2.7 cm mass in the right lower kidney



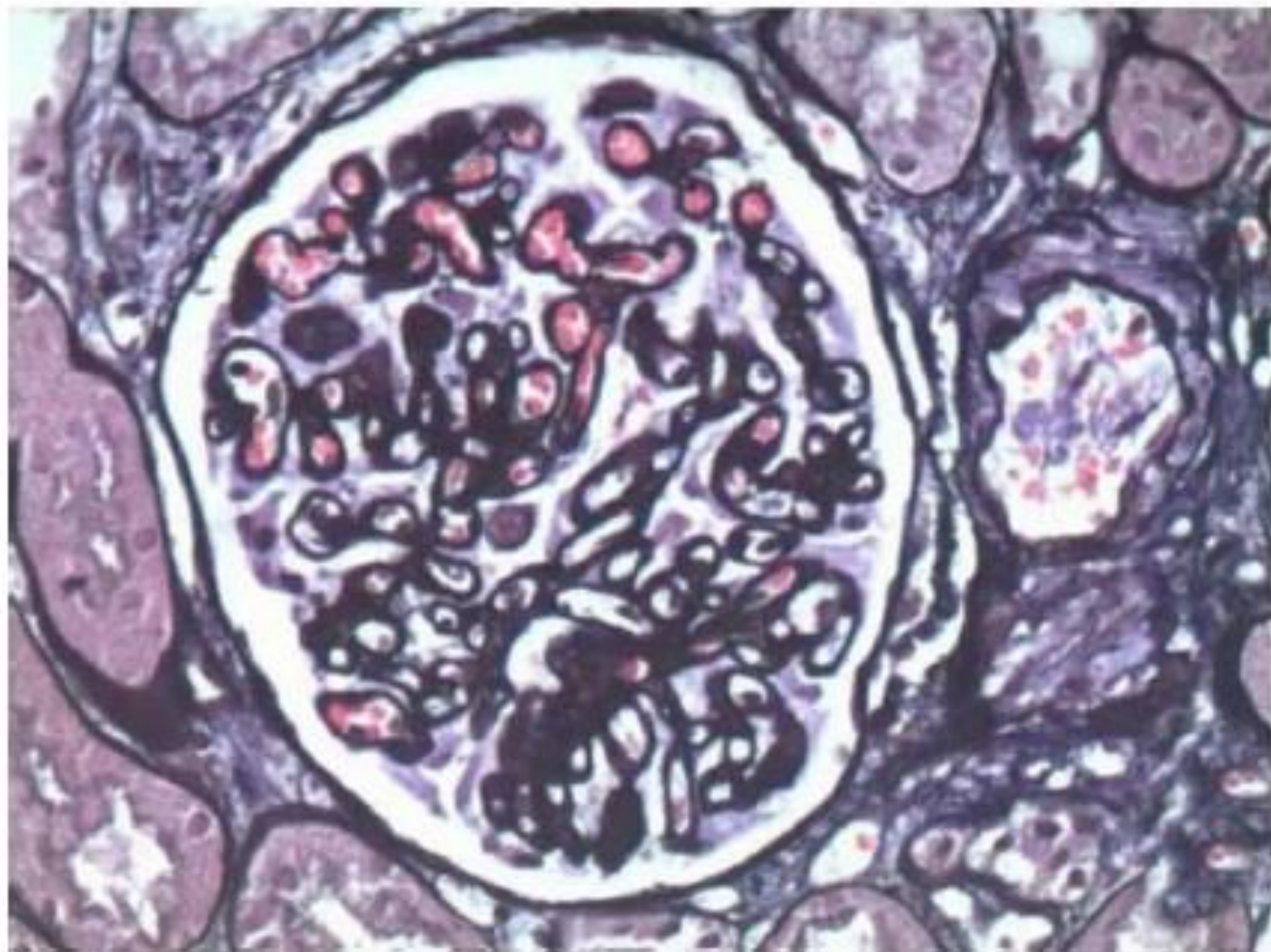
CASE 1

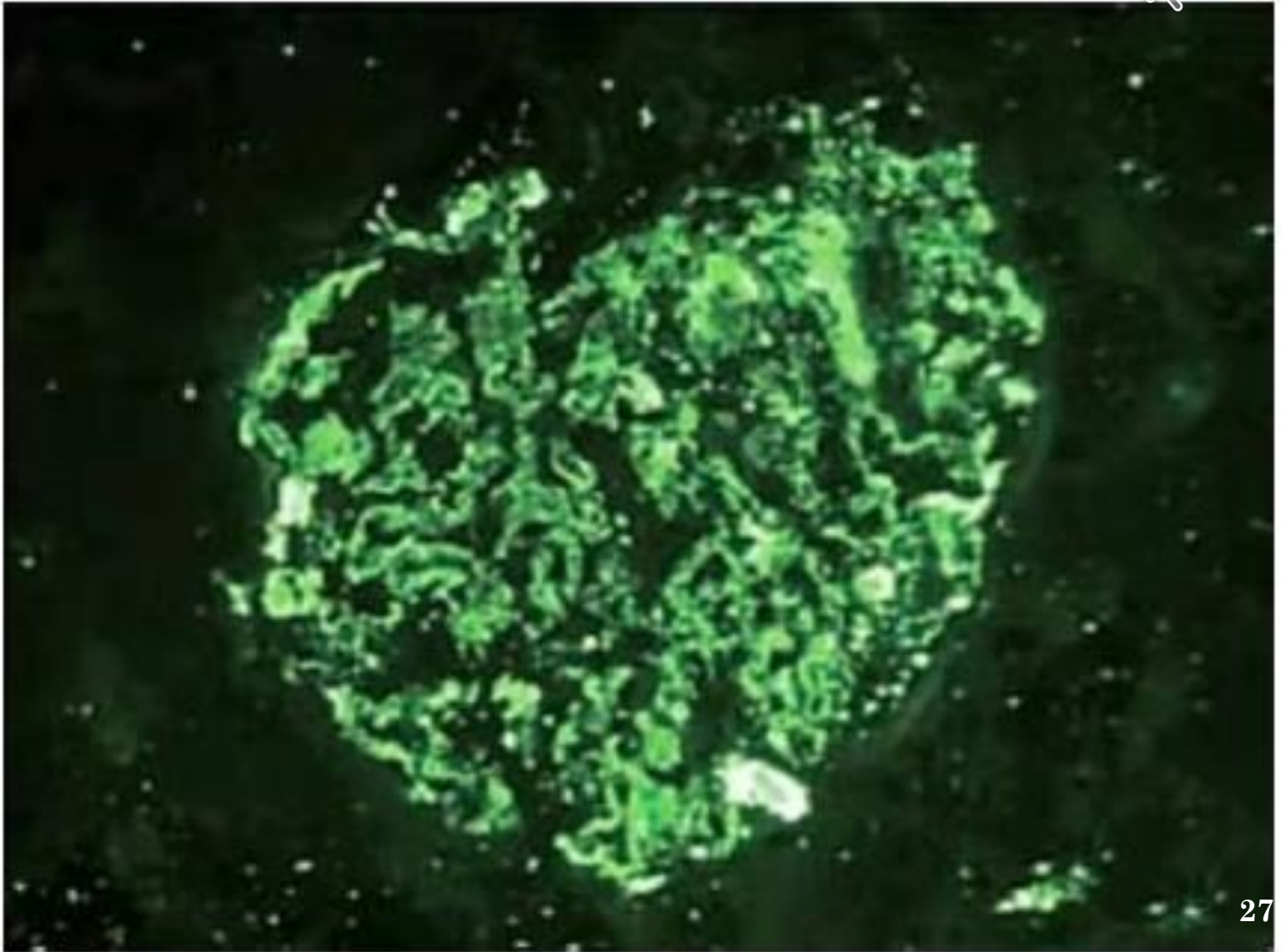
- hormone therapy for nephrotic syndrome is a contraindication for cancer patients, it can lead to further tumor growth
- Therefore, it is impossible to treat nephrotic syndrome first
- At the same time, the patient's glomerular filtration rate is low, which signifies if radical nephrectomy is performed, renal insufficiency may occur after surgery great possibility
- Thus, after the discussion of the department, laparoscopic partial nephrectomy is performed



CASE 1

- The size of the right renal mass was 3.0 cm × 2.8 cm × 2.5 cm
- Microscopically conforming to renal clear cell carcinoma, and locally invading the capsule, which did not break through
- To determine the etiology of nephrotic syndrome, a small amount of normal renal tissue specimens were taken







CASE 1

During 1 year of follow-up, the patient did not get any medication for nephrotic syndrome

- The lower extremity edema disappeared
- Serum albumin : 31.6 g/L
- 24-hour urine protein : 3.8 g/24 h

We believe that the patient's glomerular damage has been completely improved with the resection of the primary tumor



CASE 1

- MN is most closely related to solid malignant tumors in glomerular diseases
- Lung cancer, gastric cancer, and prostate cancer are the most commonly reported tumor types, while renal cancer is rare
- After successful treatment, renal function tests, urine analysis and urine protein should be followed up for a long time
- Any recurrence of glomerular lesions may indicate the cancer recurrence



CASE 2

- A 49-year-old male patient was admitted to the Department of Nephrology with oedema, hypoproteinaemia and proteinuria during the previous 15 days
- At 1 month before admission, he had a cough and blood in the sputum
- CT imaging showed a 53 mm38 mm tumour in the upper left lobe
- Albumin : 40.2 g/l
- His renal function was normal and he had no history of urinalysis abnormalities or kidney dysfunction



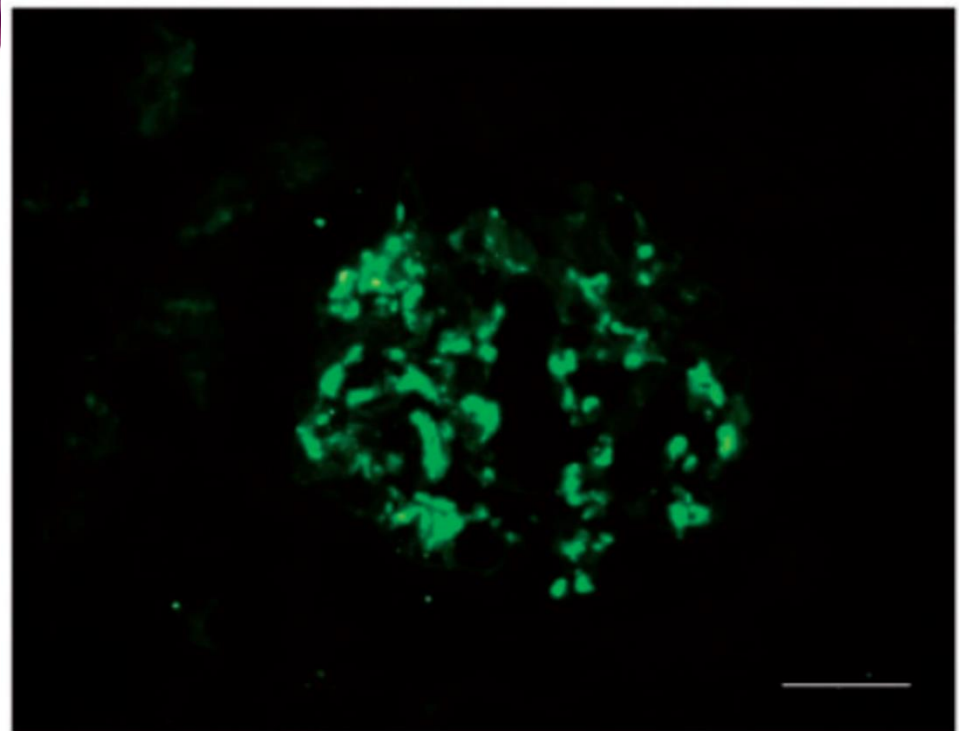
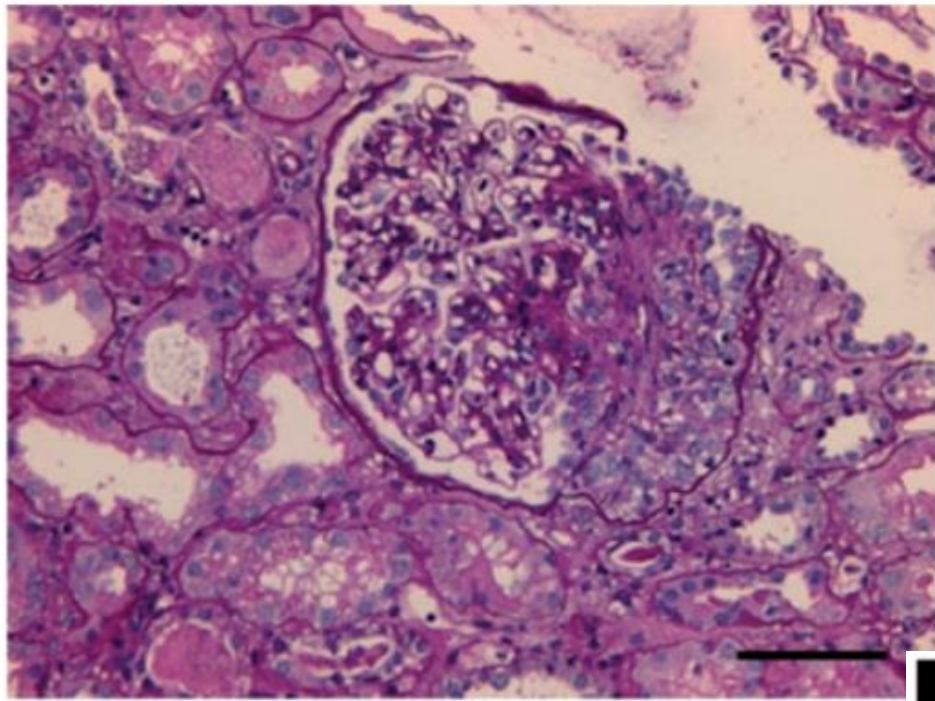
CASE 2

- The patient immediately underwent wedge resection and lymph node dissection and biopsies revealed lung adenocarcinoma with T2N1M0
- After that urine analysis showed microscopic haematuria and proteinuria
- The 24-h urine analysis revealed proteinuria of 19.38 g/day
- Serum albumin was 31.5 g/l



CASE 2

- Two weeks following the first cycle of chemotherapy, the proteinuria had reduced to 5.62 g/day
- Urine analysis showed microscopic haematuria and proteinuria
- Serum albumin level was 28.6 g/l
- Multi-deformation of RBCs accounted for 80%



CASE 2



- After the patient completed the second and third cycles of chemotherapy
- Proteinuria decreased to 1.02 g/day
- The symptoms of edema were improved during chemotherapy
- After four cycles of chemotherapy, the urine protein levels returned to normal and the lower limb edema had resolved, suggesting complete remission



*Thank
you*

