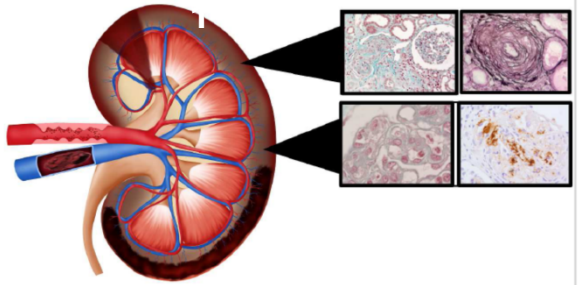
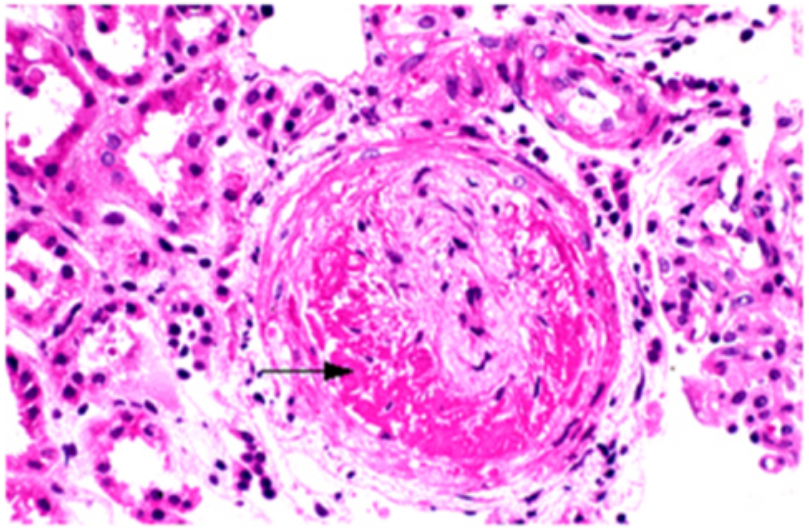
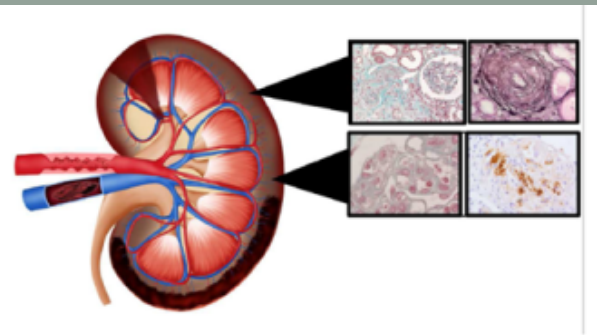


APL NEPHROPATHY

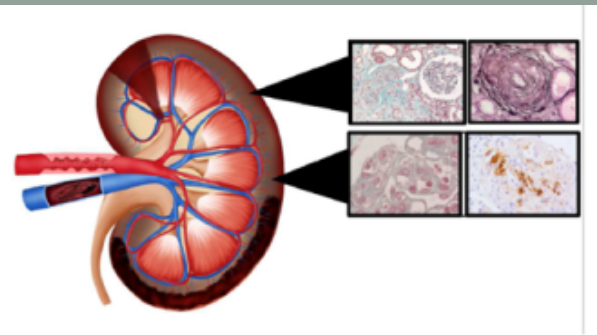
Dr Reyhane Motamedi Fard
Assistant Professor Of Nephrology
Isfahan University Of Medical Sciences





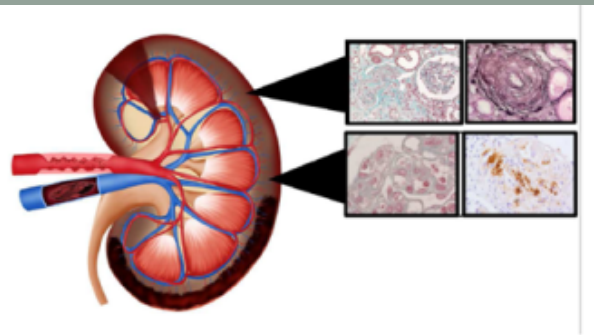
Antiphospholipid syndrome

- APS is a clinical and laboratory diagnosis characterized by both persistent laboratory evidence of aPL and related complications, which may include venous thrombosis, arterial thrombosis, adverse pregnancy outcomes, and nonthrombotic manifestations
- APS can occur as a primary condition or in the setting of SLE or another systemic autoimmune disease



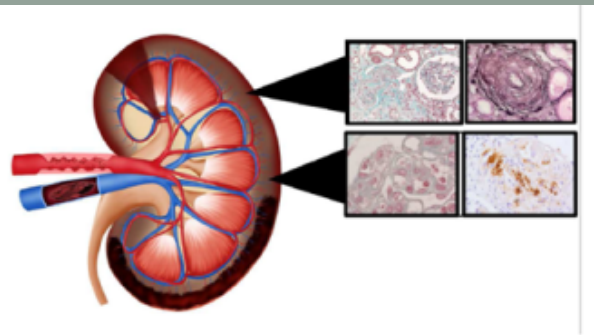
Antiphospholipid syndrome…

1. Thrombotic APS:
   - Venous and/or arterial thrombosis
2. Obstetric APS
   - Certain adverse pregnancy outcomes
3. Microvascular APS
   - Small vessel involvement, such as diffuse alveolar hemorrhage or aPL nephropathy, without moderate- to large-vessel thrombosis
4. Catastrophic APS
   - A rare, life-threatening form of APS characterized by thrombotic complications



Antiphospholipid antibodies

- aPL are a heterogenous group of antibodies
  - ✓Immunoglobulins [Igs] directed against phospholipids
  - ✓Phospholipid-binding proteins
- aPL can be transient associated with an acute infection or persistent (present on two or more occasions at least 12 weeks apart)

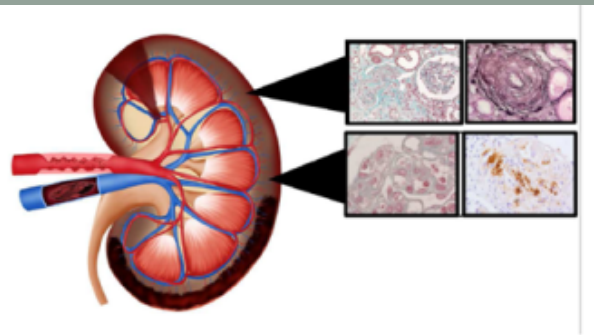


Antiphospholipid antibodies …

The commonly assayed aPL include:

- Anticardiolipin antibody (IgG or IgM), assayed by ELISA
- Anti-beta2 glycoprotein I antibody (IgG or IgM), assayed by ELISA
- Lupus anticoagulant (LA), assayed in a clotting test

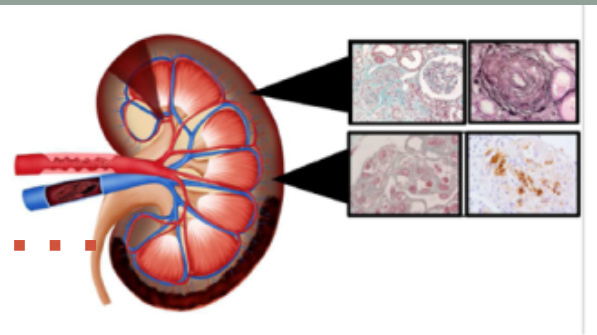
WHEN TO SUSPECT THE DIAGNOSIS



The two clinical scenarios that should raise clinical suspicion for APS :

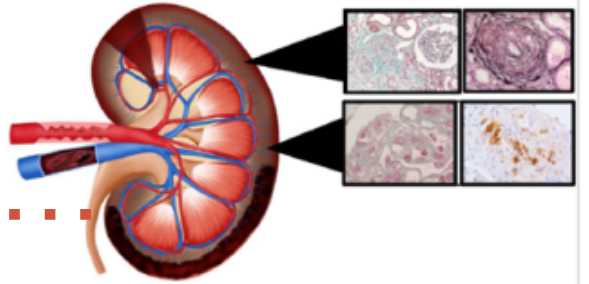
- Otherwise unexplained thrombotic events (venous or arterial) or microvascular disease, especially in young patients
- Adverse outcomes related to pregnancy, especially associated with severe preeclampsia or placental insufficiency

WHEN TO SUSPECT THE DIAGNOSIS…

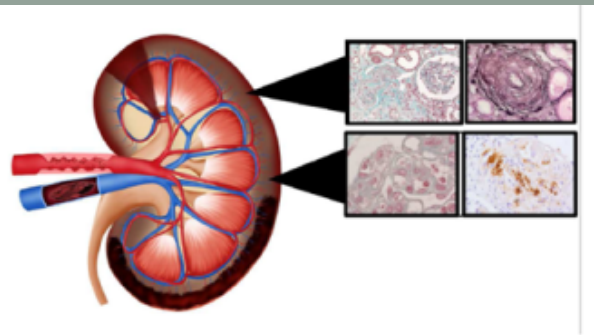


- If any of the above scenarios occurs in a patient who also manifests livedo reticularis/racemosa, valvular heart disease, pulmonary hemorrhage, thrombotic microangiopathy affecting the kidney, and/or neurologic findings then the diagnostic suspicion for APS should be further increased
- The presence of SLE

WHEN TO SUSPECT THE DIAGNOSIS…



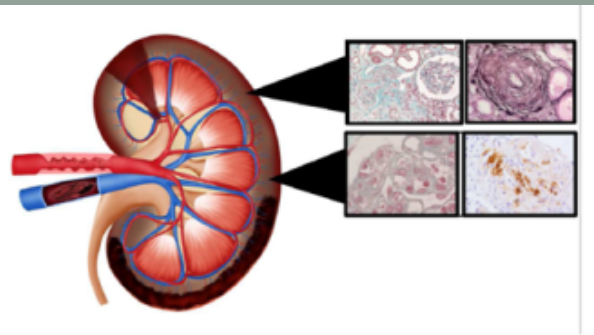
- Laboratory abnormalities
  - unexplained thrombocytopenia
  - prolongation of aPTT
  - False-positive serologic test for syphilis (VDRL or RPR)
- For patients with a low suspicion of APS, we generally do not test for antiphospholipid antibodies (aPL), such as older adults with VTE or stroke



DIAGNOSTIC EVALUATION

History

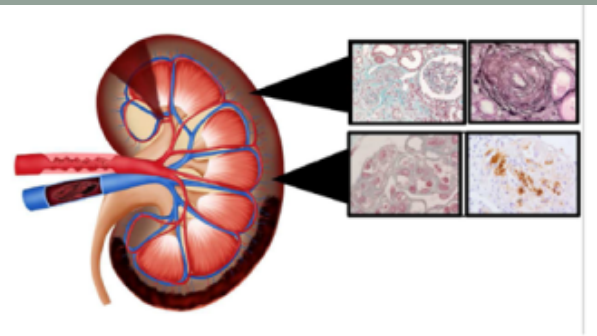
- Nature and frequency of thrombotic events
- Outcomes of pregnancies
- Thrombocytopenia
- Other risk factors for thrombosis (eg, immobility, use of estrogen-containing medications, family history of thrombophilia)



DIAGNOSTIC EVALUATION…

History…

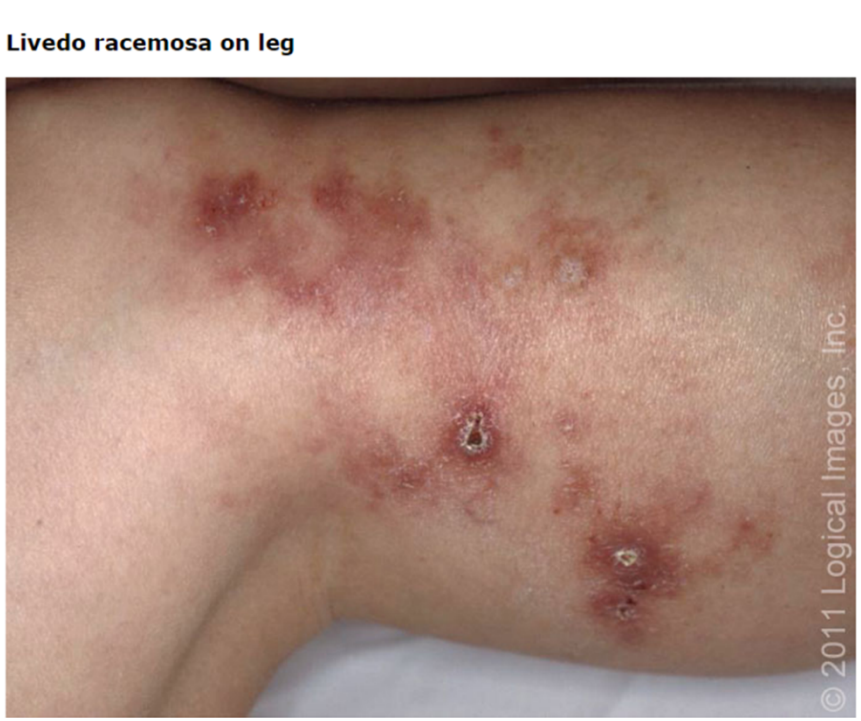
- Risk factors for other thrombotic syndromes (history of heparin exposure raises the possibility of HIT)
- Use of anticoagulants, which can affect the results of LA testing
- Symptoms associated with SLE

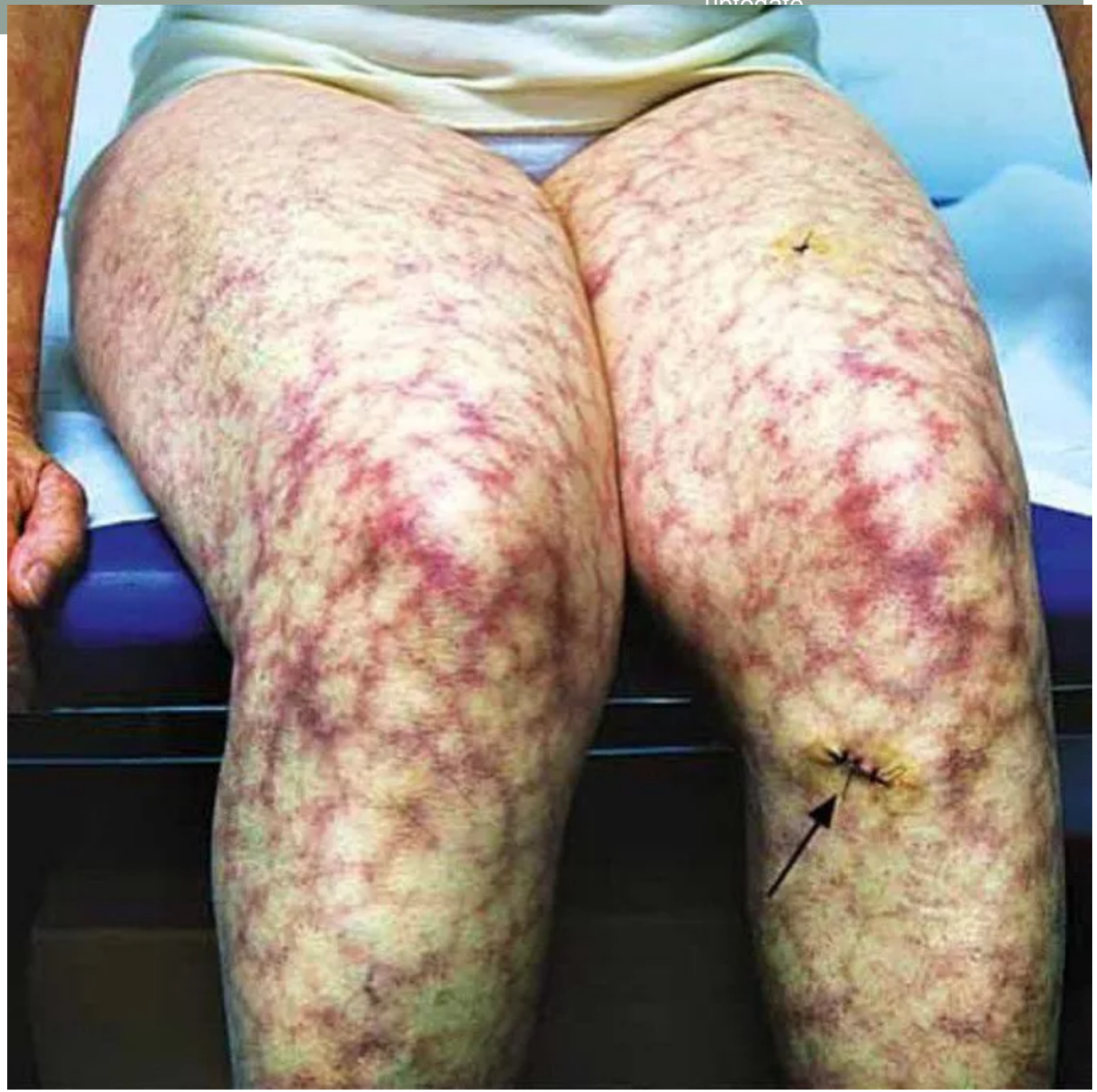


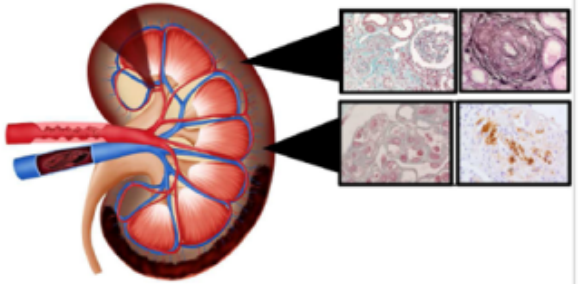
DIAGNOSTIC EVALUATION…

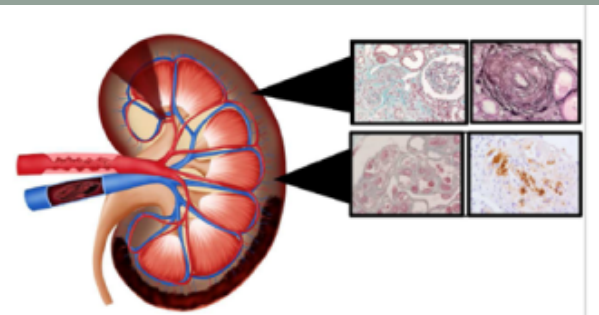
Physical examination

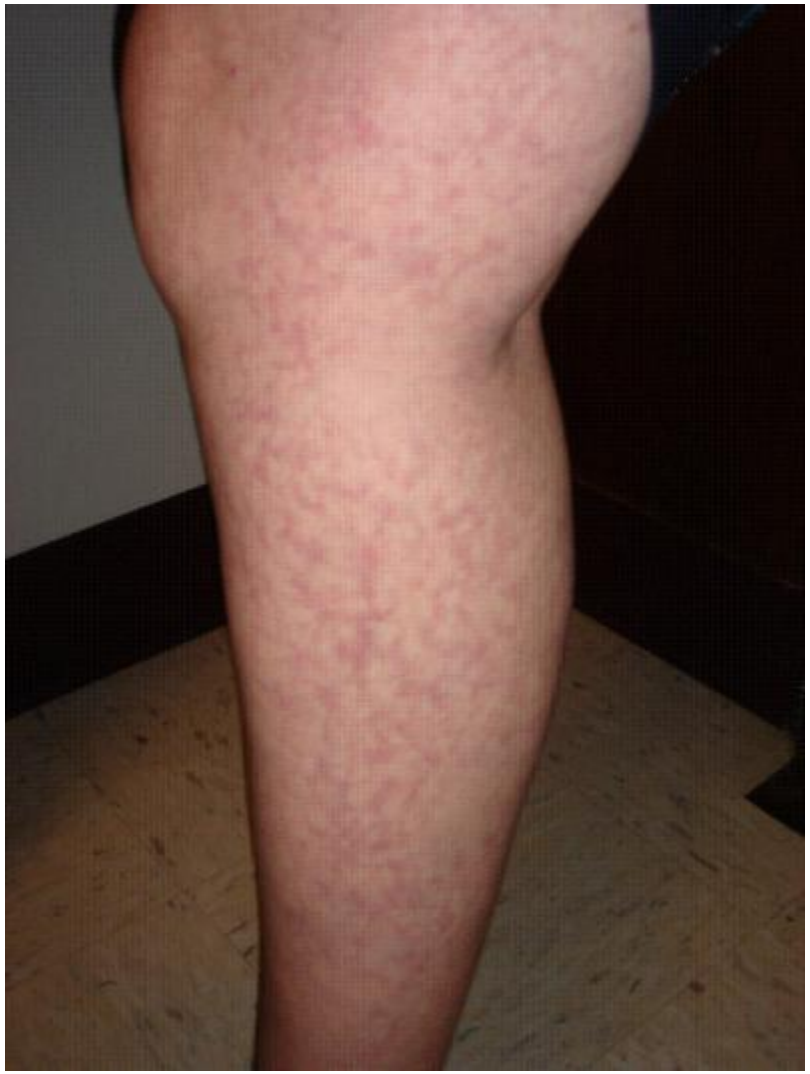
- Livedo reticularis and particularly livedo racemosa
- Digital ischemia or gangrene
- Sequelae of deep vein thrombosis
- A heart murmur
- Neurologic abnormalities suggestive of a prior stroke

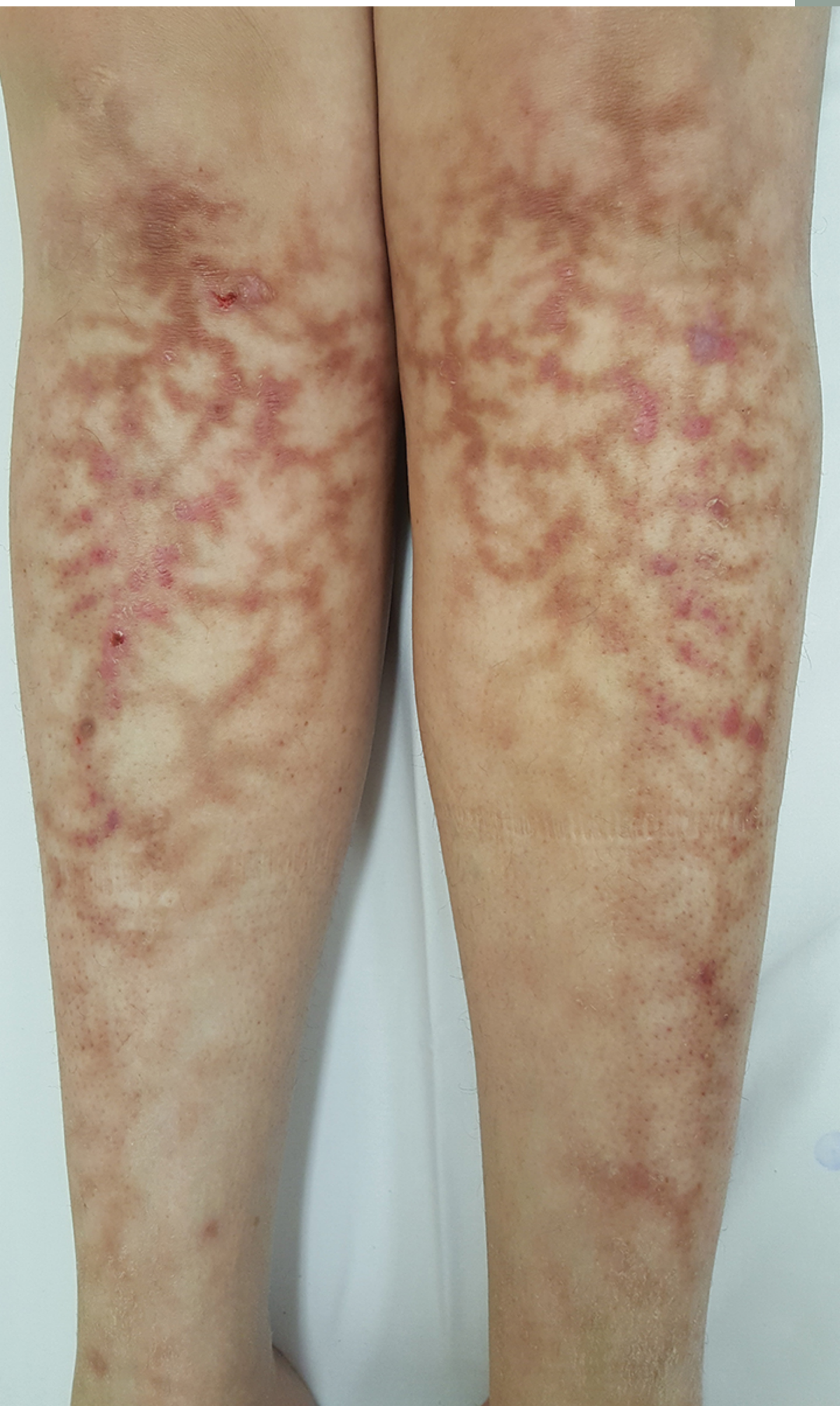


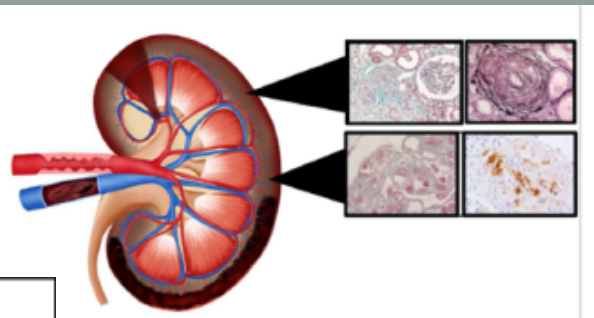


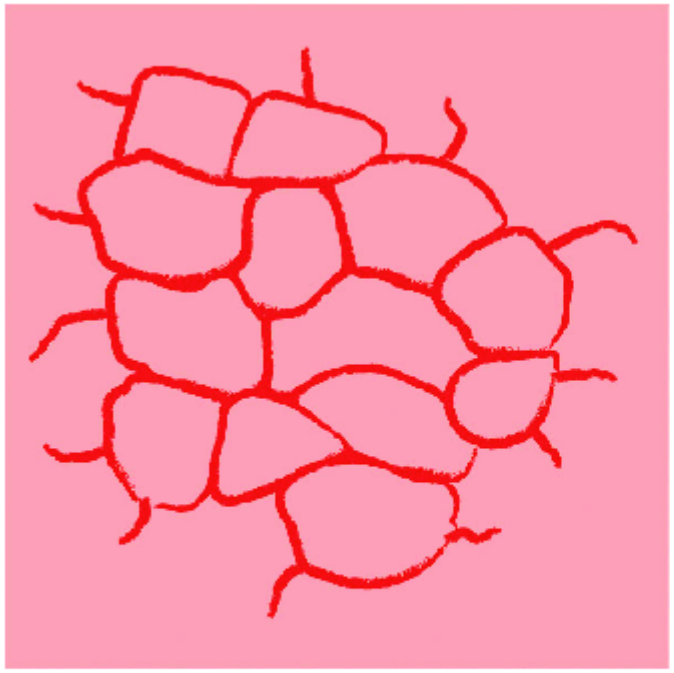




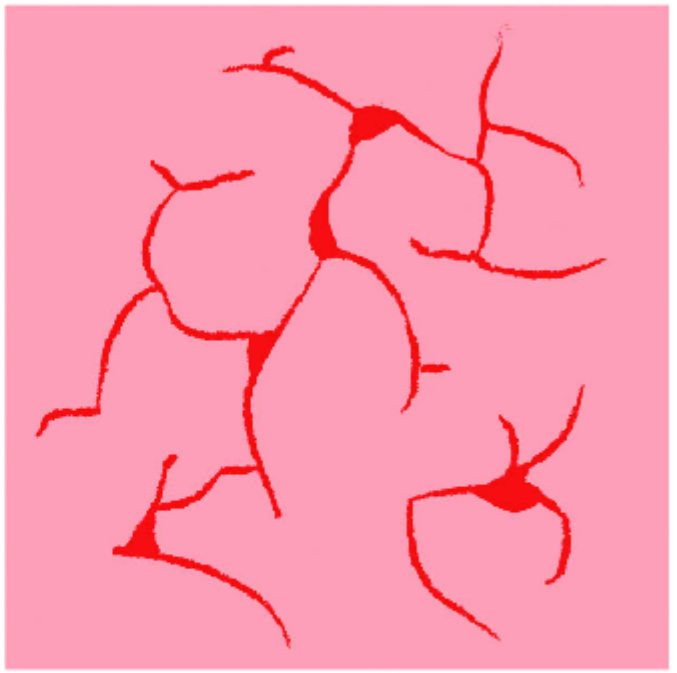




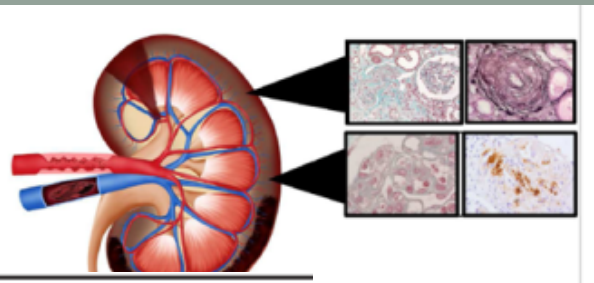


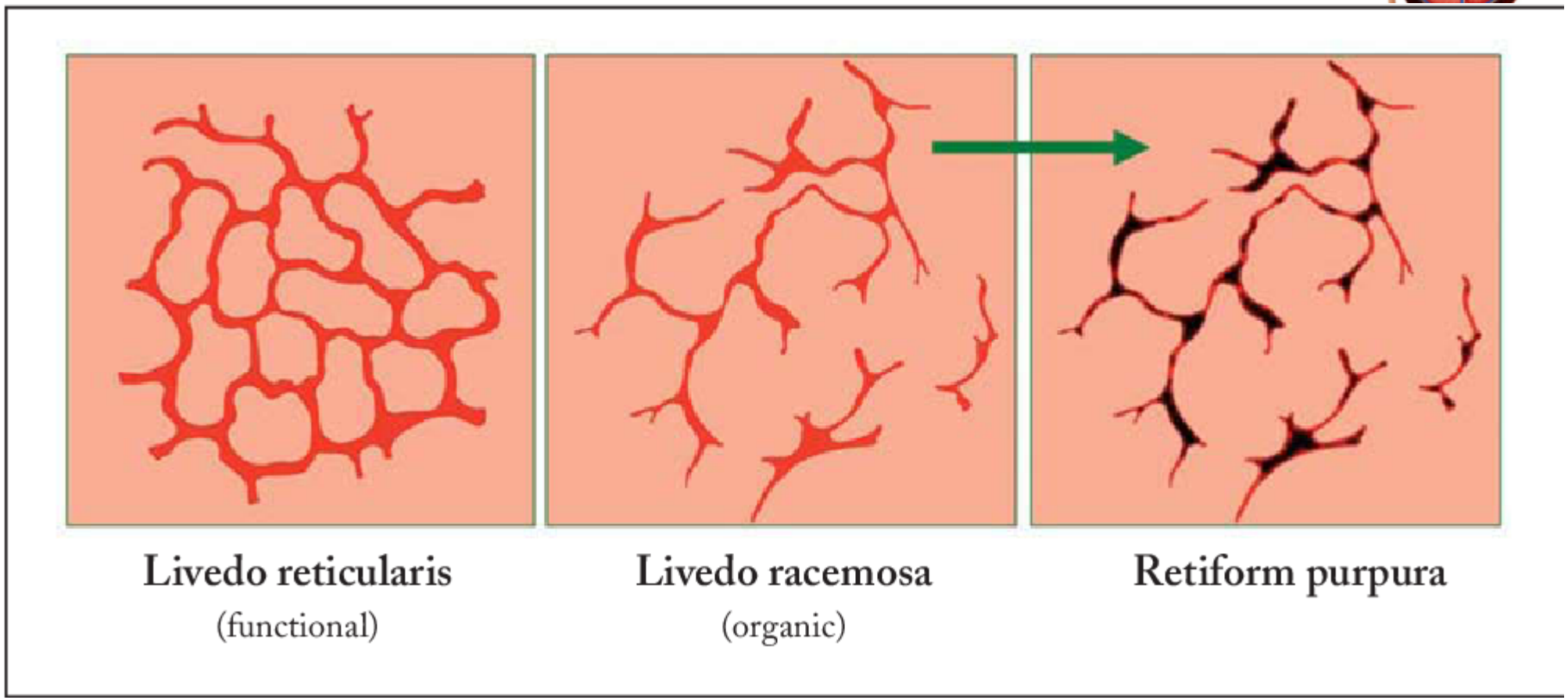


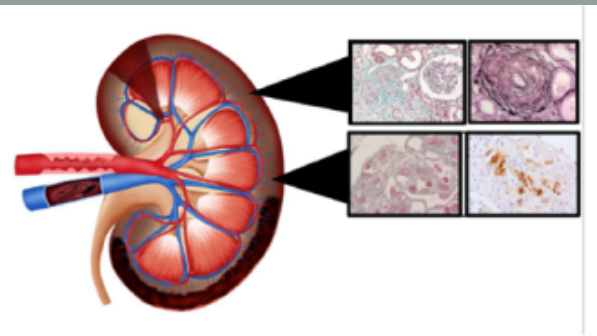
Livedo reticularis



Livedo racemosa

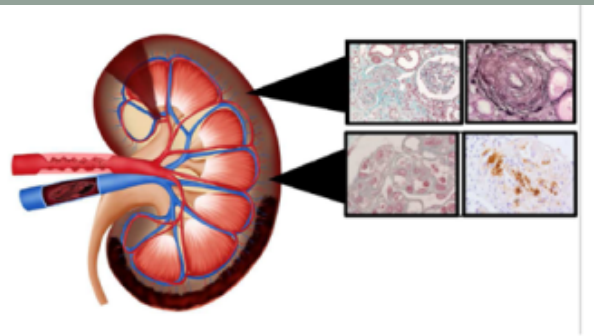



Livedo reticularis
(functional)
Livedo racemosa
(organic)
Retiform purpura



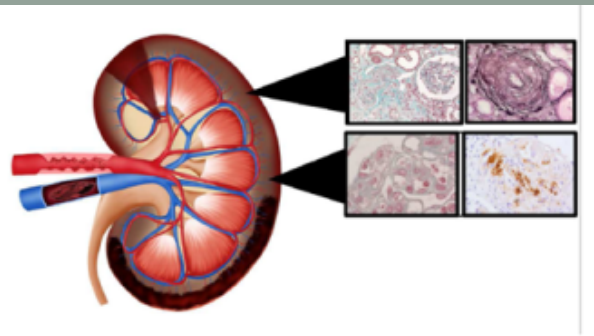
Laboratory evaluation

- Complete blood count
  - Thrombocytopenia
- PT and PTT
- Serum creatinine and urinalysis with urine sediment
  - Patients with abnormal kidney function, microscopic hematuria, proteinuria, or an active urinary sediment will need further evaluation
- SLE testing



Laboratory evaluation…

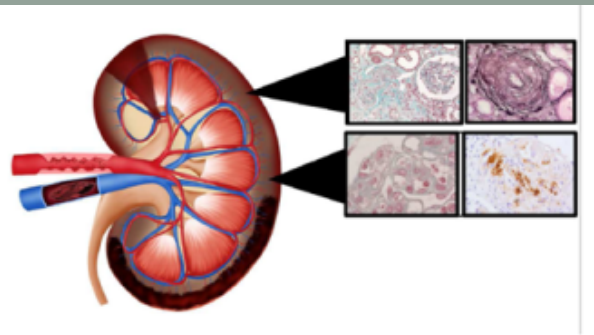
- APL antibodies may cause a falsepositive VDRL
- The presence of APL antibodies should be documented on two or more occasions at least 12 weeks apart and within 5 years of clinical manifestations



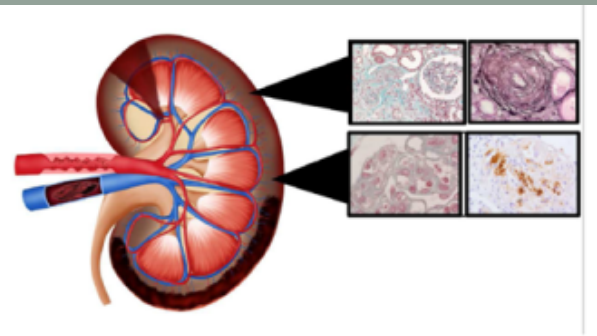
Laboratory evaluation…

- Among SLE patients there may be a genetic predisposition associated with HLA-DRB1 loci
- Despite the presence of APL antibodies, a "second hit" (such as pregnancy, contraceptive use, nephrotic syndrome, SLE, or hyperlipidemia) may be necessary for them to produce thrombotic events and the APS

APL nephropathy

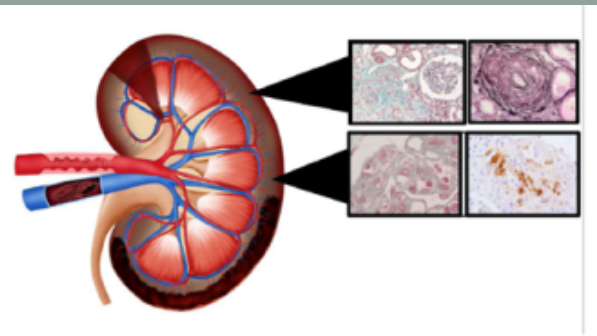


Renal involvement, so-called APL nephropathy, although generally an uncommon finding in patients with APS, occurs in as many as 25% of patients with primary APS and is characterized by thrombosis of blood vessels ranging from the glomerular capillaries to the main renal artery and vein



APL nephropathy…

- Among APL-positive SLE patients, APL nephropathy was found in two-thirds of those with APS and in one-third of those without APS
- Although patients with APL nephropathy had a higher frequency of hypertension and elevated serum creatinine levels, they did not have a higher frequency of progressive renal insufficiency, ESKD, or death



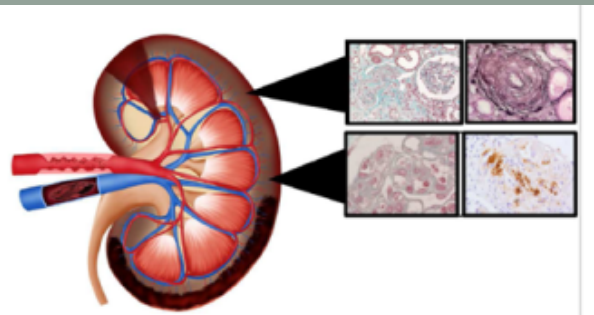
APL nephropathy…

An acute deterioration in renal function

- major renal arterial involvement ⟹ renal infarction
- renal vein thrombosis ⟹ may be silent or sudden flank pain and a decrease in renal function

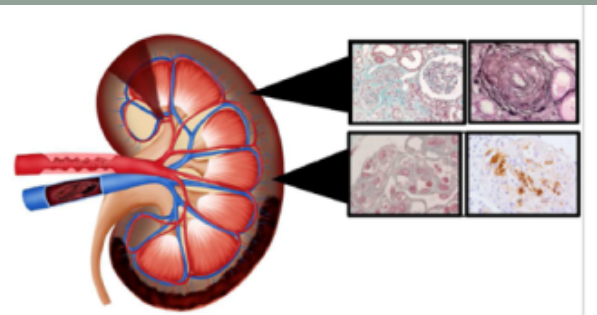
Renal artery stenosis has been reported with and without malignant hypertension

APL nephropathy…

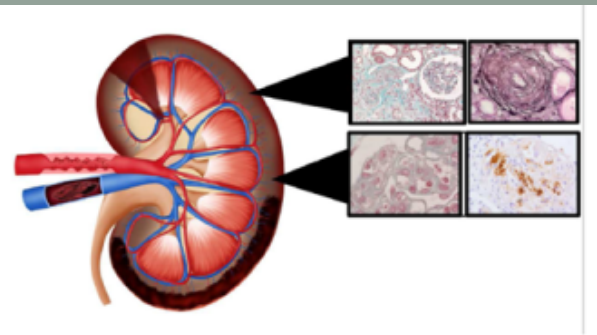


- About 10% of biopsied lupus patients have glomerular microthromboses as the major histopathologic finding
- Therapy of this glomerular lesion clearly differs from that of immune complex–mediated glomerulonephritis

APL nephropathy

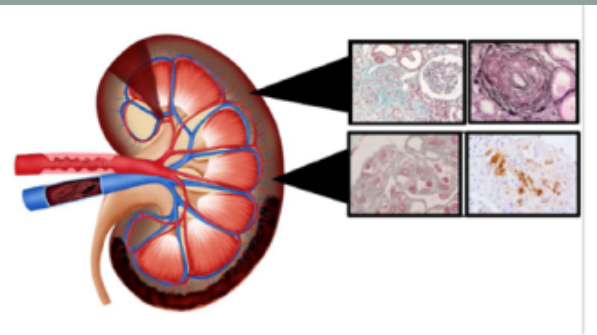


- Neither the titer of anti-DNA antibodies nor the serum complement levels correlate well with the APL antibody levels
- In SLE, high titers of IgG anticardiolipin antibody usually correlate well with the risk of thrombosis



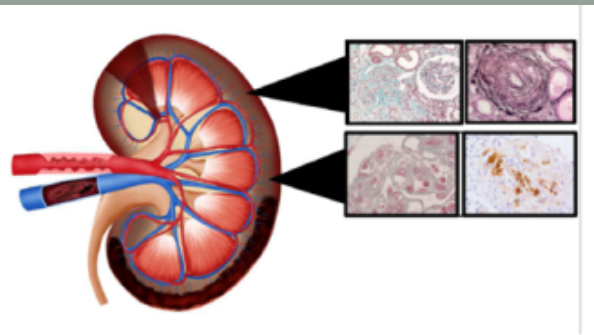
Timing of testing

- Initial aPL testing
  - Typically, initial aPL testing is performed at the time of the thrombosis or adverse pregnancy outcome
- Confirmatory aPL testing
  - In patients with initial positive testing for aPL, testing should be repeated after ≥12 weeks to confirm persistence of the aCL, anti-beta2GPI, or LA



Timing of testing…

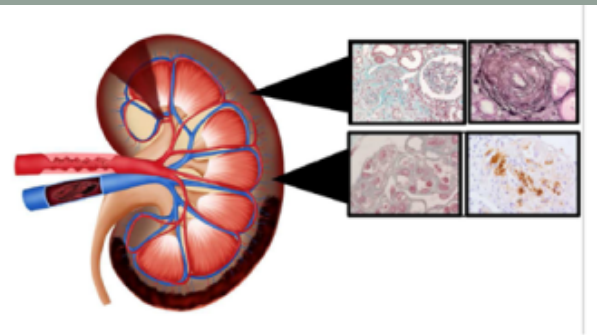
- Transiently elevated levels of IgG or IgM aCL, as well as a positive LA test, can occur with certain infections or drug exposures
- In patients who are receiving an anticoagulant, we test for aCL and anti-beta2GPI antibodies; these results are unaffected by anticoagulation



Interpretation of positive results

- Positive LA test, based on the guidelines of International Society of Thrombosis and Haemostasis
- aCL IgG or IgM, with a titer >40 units
- Anti-beta2GPI IgG or IgM, with a titer >40 units

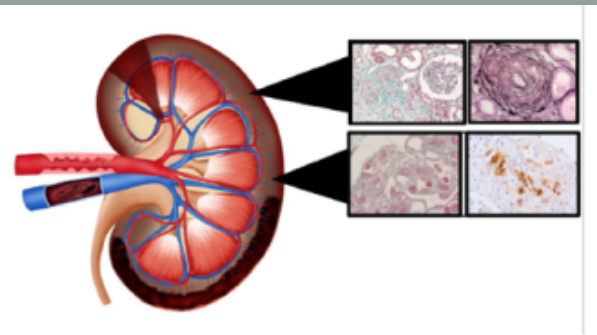
Risk stratification based on antiphospholipid antibody profile



High-risk profile

- A persistently positive LA with or without persistently positive moderate- to high-titer aCL and/or anti-beta2GPI IgG or IgM (moderate titer 40 to 79 units, high titer ≥80 units)
- Some experts consider triple-positive results (LA, aCL, and anti-beta2GPI) to be associated with the highest risk for clinical complications

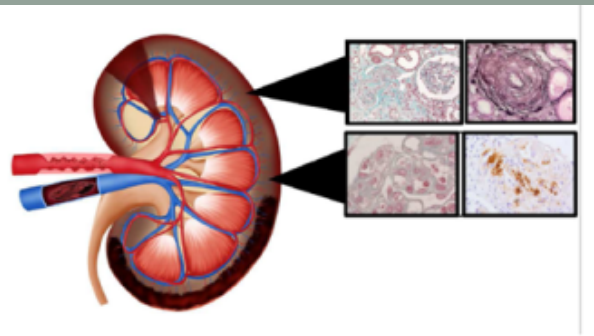
Risk stratification based on antiphospholipid antibody profile …



Moderate-risk profile

- A negative LA test with persistently positive moderate- to high-titer aCL and/or anti-beta2GPI IgG or IgM
- The IgG isotype of aCL and anti-beta2GPI has a stronger association with aPL-related clinical events compared with IgM isotypes

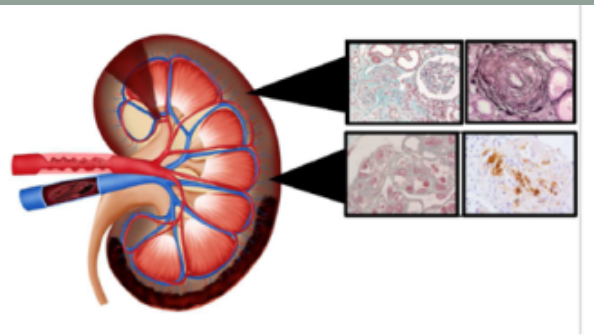
Risk stratification based on antiphospholipid antibody profile …



Low-risk profile

- A negative LA test with persistently positive low-titer aCL and/or anti-beta2GPI

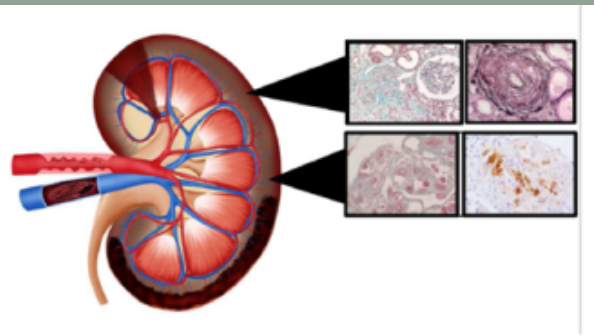
  IgG or IgM (low titer 20 to 39 units)



DIAGNOSIS

- The diagnosis of APS is based on the presence of at least one clinical manifestation (venous thrombosis, arterial thrombosis, pregnancy morbidity) in the setting of persistently positive aPL Laboratory testing must be positive on two separate occasions at least 12 weeks apart to confirm persistence

Other conditions associated with antiphospholipid antibodies



- Bacterial
- Viral
- Parasitic
- Medications
- Malignancy

ACR/EULAR classification criteria for antiphospholipid syndrome

Entry criteria*

At least 1 documented¶ clinical criterion listed below (domains 1 to 6)

plus

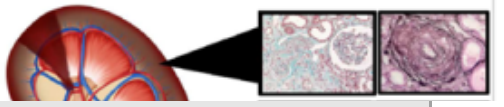
A positive antiphospholipid antibody (aPL) test
(a lupus anticoagulant test, or moderate to high titers of
anticardiolipin or anti-beta$_2$-glycoprotein-I antibodies [IgG or IgM])
within 3 years¶ of the clinical criterion

If absent, do not attempt to classify as APS - If present, apply additive criteria

Additive clinical and laboratory criteria*

Do not count a clinical criterion if there is an equally or more likely explanation than APS.
Within each domain, only count the highest weighted criterion towards the total score.

Clinical domains and criteria	Weight		Weight
D1. Macrovascular (venous thromboembolism [VTE])		**D2. Macrovascular (arterial thrombosis [AT])**	
VTE with a high-risk VTE profile[Δ]	1	AT with a high-risk CVD profile[Δ]	2
VTE without a high-risk VTE profile[Δ]	3	AT without a high-risk CVD profile[Δ]	4
D3. Microvascular		**D4. Obstetric**	
Suspected (1 or more of the following): ▪ Livedo racemosa (exam) ▪ Livedoid vasculopathy lesions (exam) ▪ Acute/chronic aPL-nephropathy (exam or lab) ▪ Pulmonary hemorrhage (symptoms and imaging)	2	≥3 Consecutive pre-fetal (<10 weeks) and/or early fetal (10 weeks 0 days to 15 weeks 6 days) deaths	1
		Fetal death (16 weeks 0 days to 33 weeks 6 days) in the absence of pre-eclampsia (PEC) with severe features or placental insufficiency (PI) with severe features	1
Established (1 of more of the following): ▪ Livedoid vasculopathy (pathology[◇]) ▪ Acute/chronic aPL-nephropathy (pathology[◇]) ▪ Pulmonary hemorrhage (BAL or pathology[◇]) ▪ Myocardial disease (imaging or pathology) ▪ Adrenal hemorrhage (imaging or pathology)	5	PEC with severe features (<34 weeks 0 days) **or** PI with severe features(<34 weeks 0 days) with/without fetal death	3
		PEC with severe features(<34 weeks 0 days) **and** PI with severe features(<34 weeks 0 days) with/without fetal death	4
D5. Cardiac valve		**D6. Hematology**	
Thickening	2	Thrombocytopenia (lowest 20 to 130 × 10^9/L)	2
Vegetation	4		



Laboratory (aPL) domains and criteria§	Weight		
D7. aPL test by coagulation-based functional assay (lupus anticoagulant test [LAC])		**D8. aPL test by solid phase assay (anti-cardiolipin antibody [aCL] ELISA and/or anti-beta$_2$-glycoprotein-I antibody [abeta$_2$GPI] ELISA [persistent])**	
Positive LAC (single - 1 time)	1	Moderate or high positive (IgM) (aCL and/or abeta$_2$GPI)	1
Positive LAC (persistent)	5	Moderate positive (IgG) (aCL and/or abeta$_2$GPI)	4
		High positive (IgG) (aCL **or** abeta$_2$GPI)	5
		High positive (IgG) (aCL **and** abeta$_2$GPI)	7

Total score

Classify as antiphospholipid syndrome for research purposes if there are
at least 3 points from clinical domains **and** at least 3 points from laboratory domains

Sydney criteria fo APLS

Clinical criteria

Vascular thrombosis

≥1 clinical episode of arterial, venous or small vessel thrombosis. Thrombosis must be documented. If histopathological confirmation if used, the latter must show absence of vessel wall inflammation

Pregnancy related complications

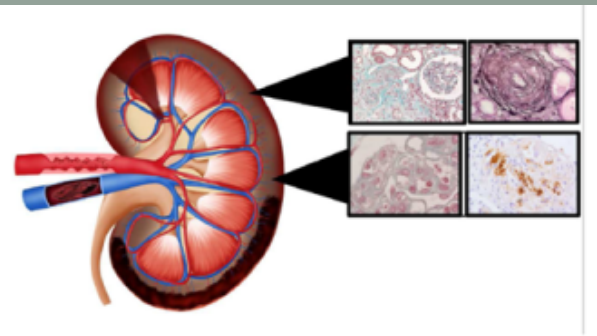
- ≥1 unexplained fetal death in a fetus of normal morphology ≥ 10 weeks of pregnancy
- ≥1 premature births of a fetus with normal morphology <34 weeks of pregnancy, severe preeclampsia or eclampsia or evidence of placental insufficiency
- ≥3 consecutive unexplained stillbirths before <10th week of gestation having ruled out parental factors (anatomic, hormonal or chromosomic anomalies)

Biological criteria

Detection of antiphospholipid antibodies ≥2 occasions with at least 12 weeks interval and <5 years before clinical presentation, with at least ≥ 1 following criteria:

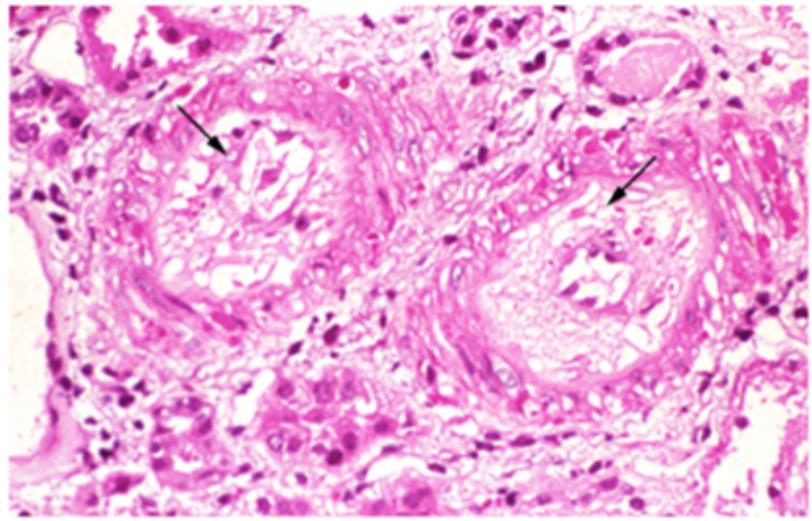
- Positive lupus anticoagulant
- Medium to high titers of anticardiolipin antibodies (> 40GPL or MPL, or > 99th percentile) of immunoglobulin G (IgG) or IgM isotype
- Positive anti-β2-glycoprotéine 1 of IgG or IgM isotype (> 99th percentile)

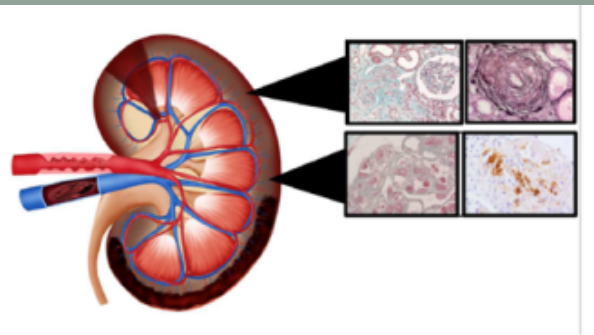
aPL-associated nephropathy



When small renal vessels, such as glomerular capillaries, are involved, the pathological findings resemble those found in other diseases associated with a

TMA, including the HUS, and TTP





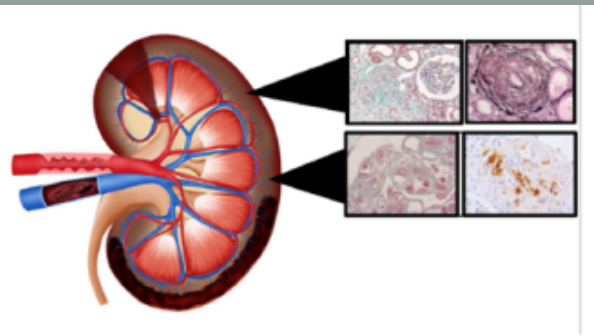
aPL-associated nephropathy…

- Manifestations

- Asymptomatic, mild proteinuria (<2 g/day) with normal kidney function

- Others develop acute or subacute kidney injury with proteinuria (which can reach the nephrotic range), an active urine sediment and often marked hypertension

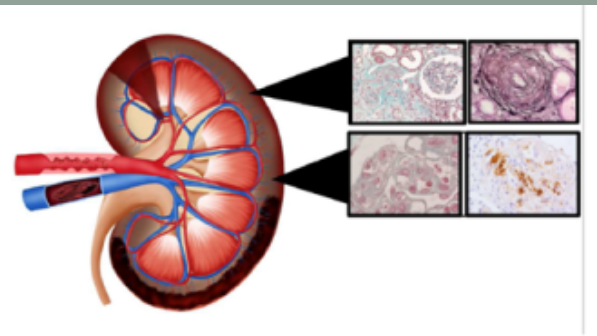
aPL-associated nephropathy…



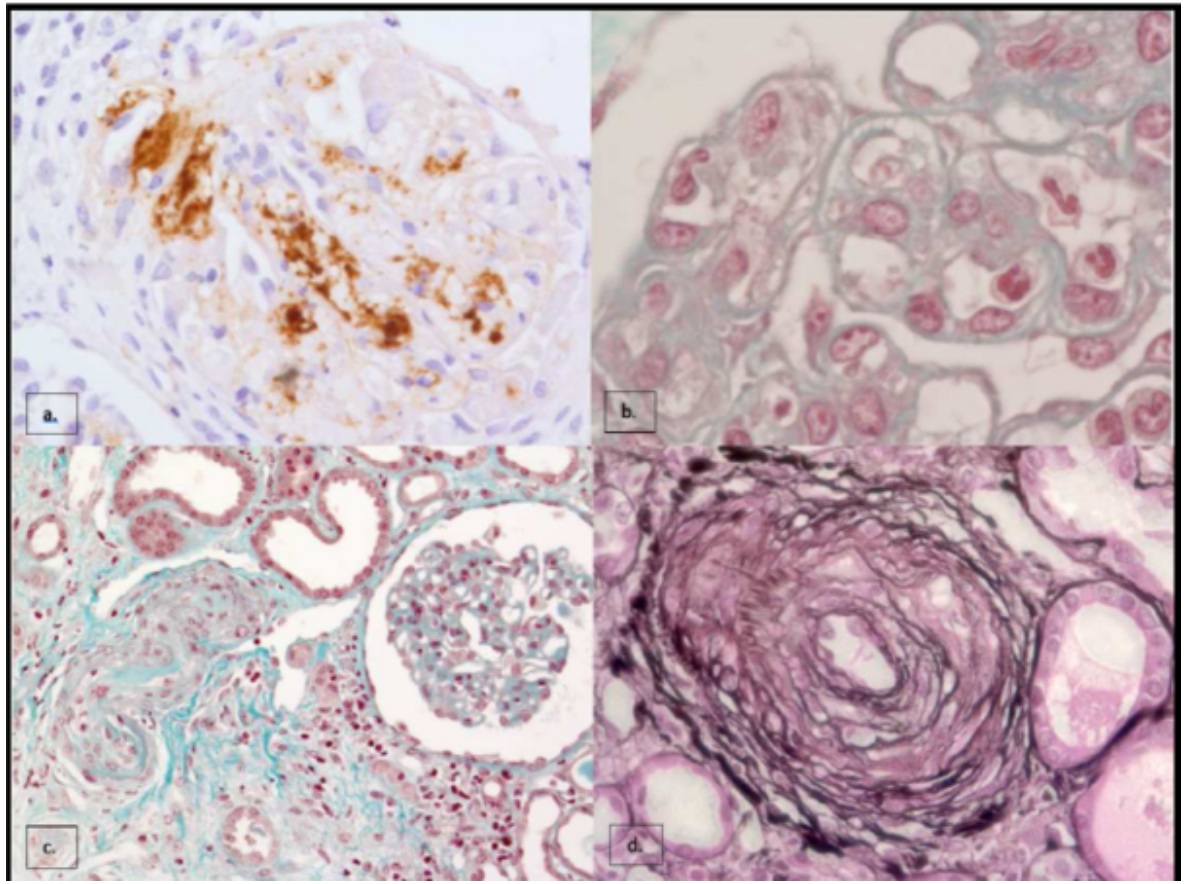
Manifestations

- Large vessel disease
  - Large renal arterial thrombosis with renal infarction can present with unilateral or bilateral flank pain, hematuria, and decreased kidney function
- Renal angiography, or CT or MRA should be performed to confirm the diagnosis

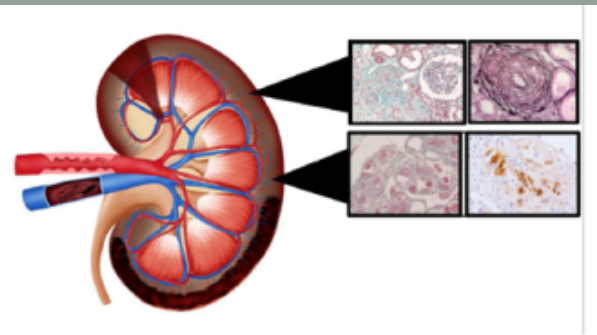
Other glomerular lesions associated with primary APS



- Membranous Nephropathy
- Minimal Change Disease
- Pauci-immune Glomerulonephritis

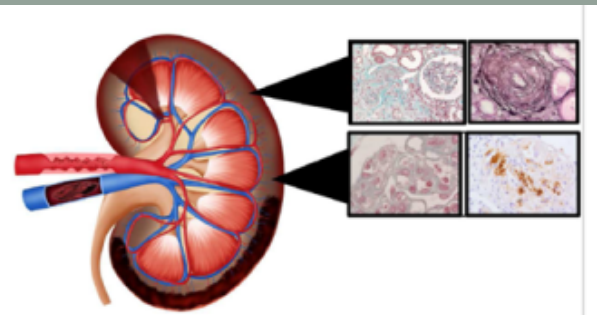


Kidney disease in APS associated with SLE



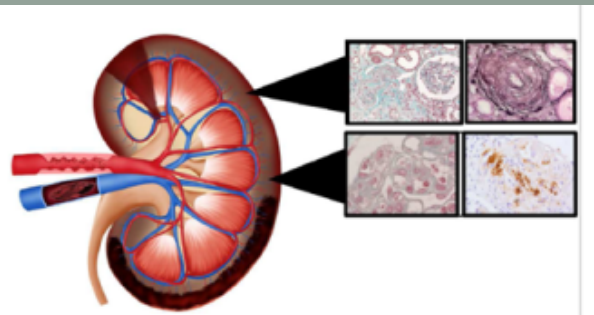
- There was a significant correlation between antibody presence and the eventual development of CKD
- The presence of aPL may also be associated with a higher mortality in patients with lupus nephritis

APL nephropathy…



- There is a high prevalence of APL antibodies (10% to 30%) in hemodialysis patients irrespective of patient age, gender, or duration of the dialysis
- High prevalence of aPL that are associated with an increased incidence of thrombotic events, often involving the vascular access
- Patients with renal insufficiency and those on peritoneal dialysis have a much lower incidence of APL antibodies

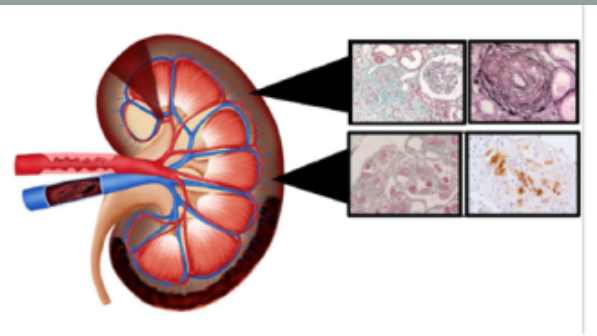
Hemodialysis…



- Patients with APS treated with hemodialysis have an increased incidence of recurrent thrombosis in AV grafts
- In such patients, treatment with warfarin may increase AV graft survival

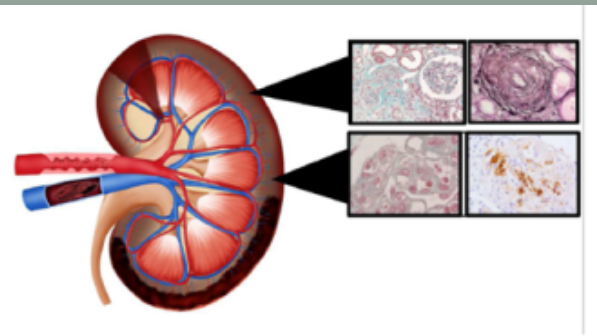
for the risks of bleeding in anticoagulated patients, many would only anticoagulate patients who have repeat AV graft clotting

Kidney transplantation

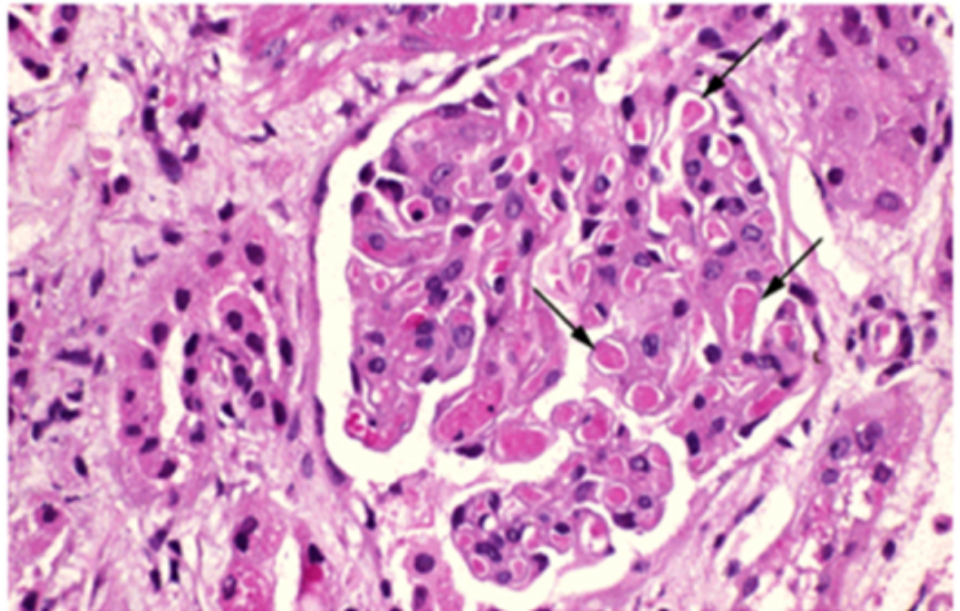


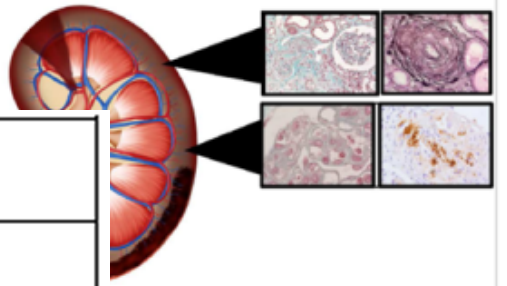
- Patients with a positive aPL or the APS have a worse outcome after kidney transplantation than those without these findings
- Patients with SLE, a positive aPL, a history of thromboembolic events and lupus nephritis, may benefit from continued warfarin therapy after kidney transplantation
- If untreated, these patients appear to be at risk for both intrarenal and systemic clotting events

Kidney transplantation…



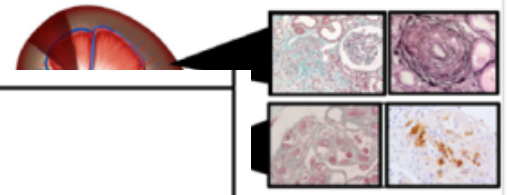
- Many transplant nephrologists anticoagulate all patients with aPL and a history of coagulation events during the peritransplant period
- It is unknown how long such treatment should be continued or whether it should be continued indefinitely





Renal related complications of APLS

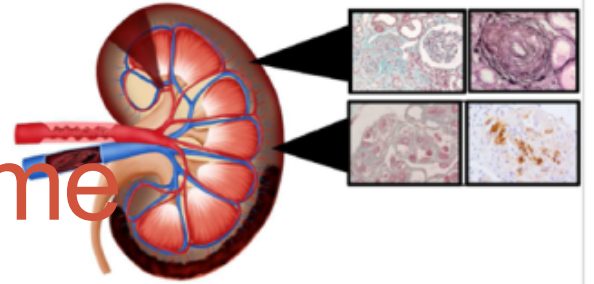
Hypertension
Renal artery stenosis or thrombosis (uni or bilateral)
Renal vein thrombosis (uni ou bilateral)
Ischemic nephropathy
APLS nephropathy (APLSN) · Acute : Thrombotic microangiopathy (TMA) · Chronic : aspecific intrarenal vasculopathy (Arteriosclerosis, intimal hyperplasia, tubular thyroidization , cortical atrophy)
Glomerulonephritis reported with APLS (rare) · Primary APLS : Membranous nephropathy, C3 glomerulopathy, MCD, FSGS · Secondary APLS: Lupus nephritis class I-VI



Renal related complications of APLS

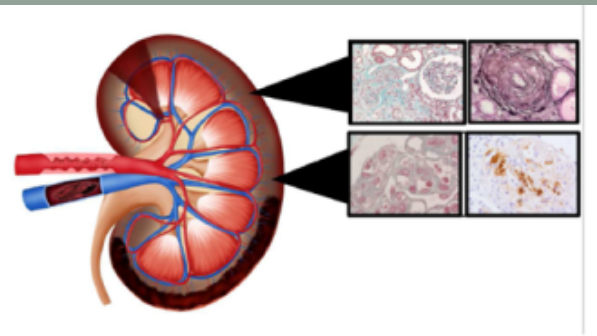
Renal infarction
Cortical necrosis
Vascular access thrombosis in hemodialysis patient
Renal allograft · De novo or relapse of APLSN of allograft · Renal vein thrombosis · Renal artery thrombosis/stenosis
Pregnancy related · Preeclampsia

Management of antiphospholipid syndrome



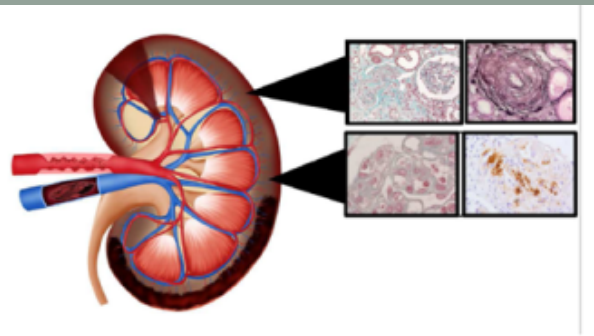
Antithrombotic therapy may include:

- Antiplatelet agents
  - Antiplatelet agents ⟹ preventing arterial events
- Anticoagulants
  - Anticoagulation ⟹ secondary prevention for venous or arterial thrombosis or as prophylaxis in high-risk settings



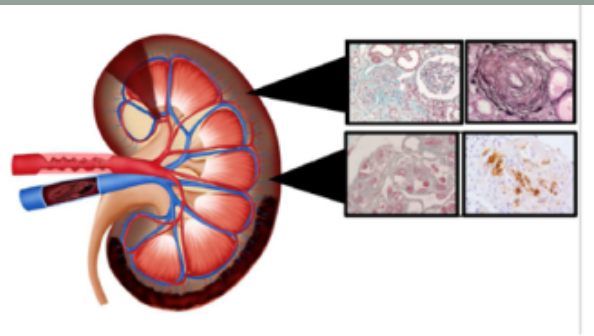
Treatment

- Many patients with APL antibodies do not experience thrombotic events
- In asymptomatic patients with APL antibodies but no evidence of thrombotic events or the APS, low-dose aspirin may be beneficial based on limited data



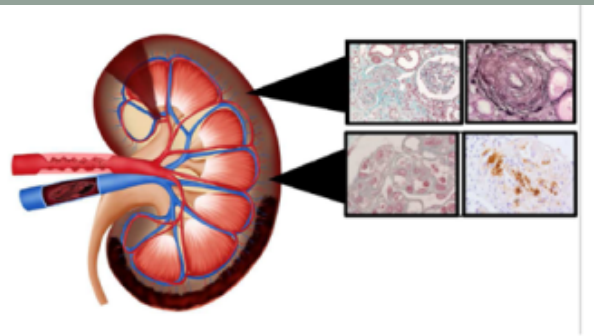
Treatment…

- Because patients with higher titers of IgG APL antibody have a greater incidence of thrombotic events, they may benefit from anticoagulation
- In patients with full APS, anticoagulation with heparin followed by warfarin has proven more effective than no therapy, aspirin, or low-dose anticoagulation in preventing recurrent thrombosis



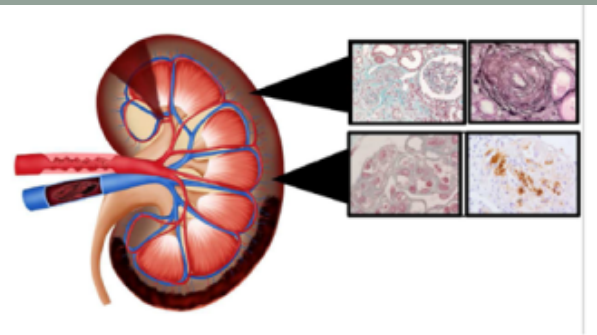
Treatment

- The role of immunosuppression is uncertain in APS
- In SLE patients the anti-DNA antibody titer and the serum complement may normalize with immunosuppression without a significant change in a high titer of IgG APL antibody
- In pregnant patients with APS, heparin and low-dose aspirin have been successful, whereas prednisone therapy has not



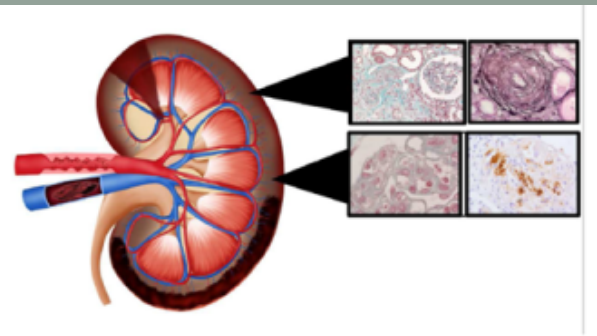
Treatment

In rare patients who cannot tolerate anticoagulation due to recent bleeding, who have thromboembolic events despite adequate anticoagulation, or who have catastrophic APS, plasmapheresis with corticosteroids and other immunosuppressives have been used with some success



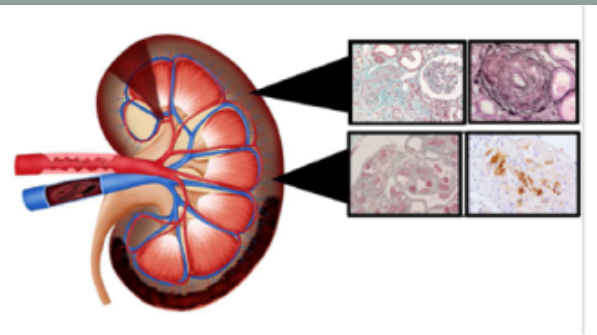
Acute kidney injury

- Selected patients with AKI may respond
  - plasmapheresis → removing the pathogenic antibody
  - corticosteroids
  - chronic anticoagulation
- The optimal apheresis regimen for AKI is uncertain
- Three to five one-plasma volume exchanges over a seven-day period should produce substantial lowering of aPL levels



Treatment

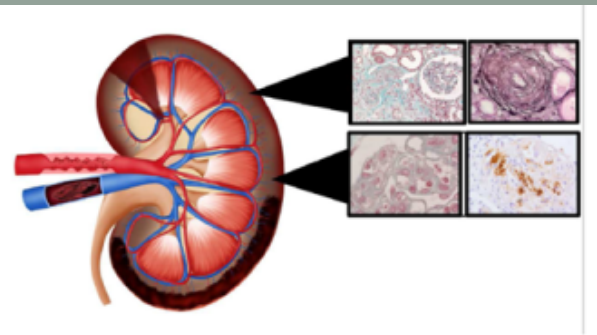
- It is uncertain whether hydroxychloroquine, used mostly in SLE patients, can prevent thromboembolic events in APS.
- There is insufficient and conflicting data on whether newer agents such as rituximab lower the levels of APLs or decrease the risk of thromboembolism.
- The use of other treatments, such as eculizumab, intravenous γ-globulin, and stem cell transplant, are only reported in isolated patients



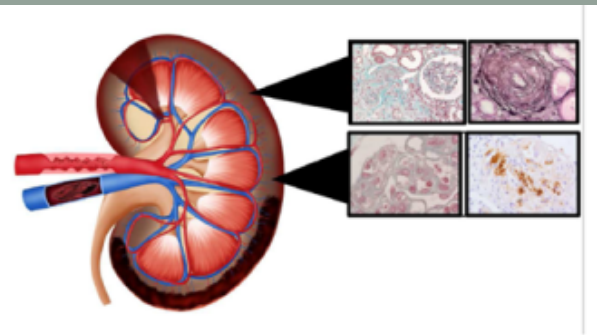
Risk of a first thrombosis with aPL

- Systemic rheumatic disease, particularly SLE
- A "high-risk" aPL profile (defined as a persistent LA, double positive aPL or triple positive aPL ,or persistently high aPL titers)
- History of obstetric APS
- Additional risk factors for venous thromboembolism (VTE; eg, recent major surgery, estrogen use, inherited thrombophilia) or arterial thromboembolism (eg, hyperlipidemia, tobacco use)

INITIAL MANAGEMENT OF ACUTE THROMBOSIS



- In individuals with suspected APS, warfarin is typically preferred over a DOAC, although a DOAC may reasonably be used in selected individuals
- The use of DOACs may be reasonable in a few selected cases of APS, particularly among those who have features of lower-risk disease (single venous thrombosis and low-risk aPL profile) or those who cannot tolerate warfarin

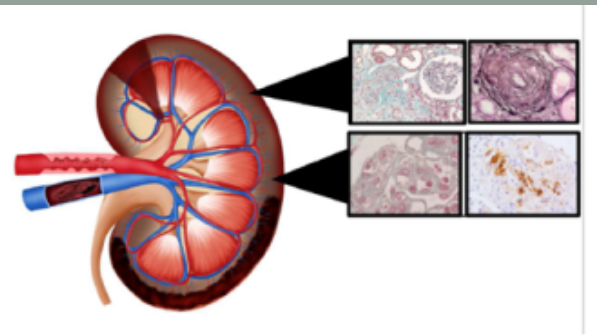


Long-term anticoagulation

Venous thrombosis

- For patients with VTE, we suggest anticoagulation with warfarin with a target INR of 2.5 (range 2 to 3) rather than a higher INR range, such as 3 to 4

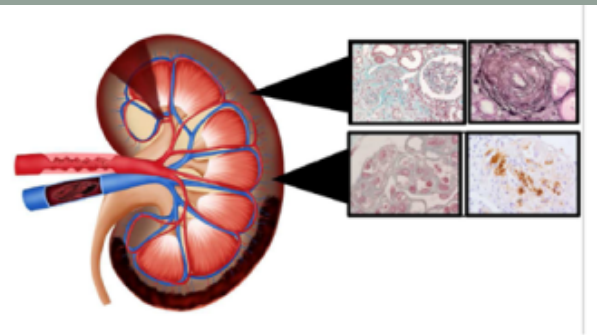
- Individuals who are pregnant or who become pregnant are treated with LMWH



Long-term anticoagulation

Arterial thrombosis

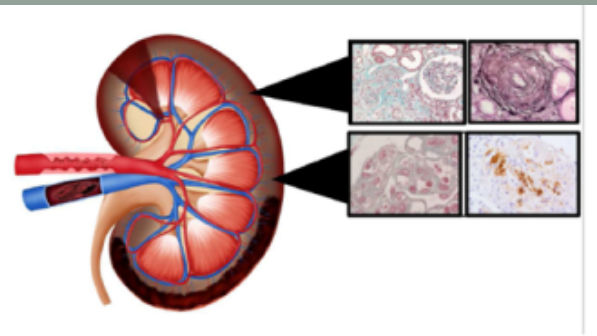
- The optimal management is less clear .
- Options include
  - standard-intensity warfarin (INR range 2 to 3), standard-intensity warfarin plus low-dose aspirin
  - higher-intensity warfarin (INR >3)
- Individuals with prior arterial thrombosis have a high risk of recurrent arterial thrombosis if treated with a DOAC rather than warfarin



Long-term anticoagulation

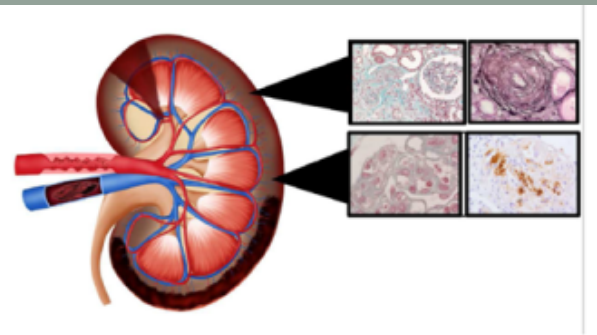
Arterial thrombosis

- For most patients with arterial thrombosis, we suggest INR range 2 to 3 plus low-dose aspirin rather than a higher INR range
- Cardiovascular risk factors such as hypertension, hyperlipidemia, and smoking should also be addressed
- Some patients with arterial thrombosis who do not have other cardiovascular risk factors, however, may reasonably be treated with standard-intensity warfarin alone



Treatment

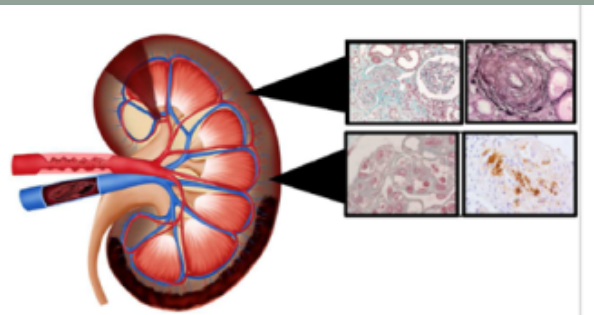
- Treatment with higher-dose warfarin (INR >3) was more effective than treatment with low-dose warfarin (INR <3) or treatment with aspirin
- The highest rate of thrombosis (1.3 per patient-year) occurred in patients within 6 months after discontinuing anticoagulation



Anticoagulant monitoring

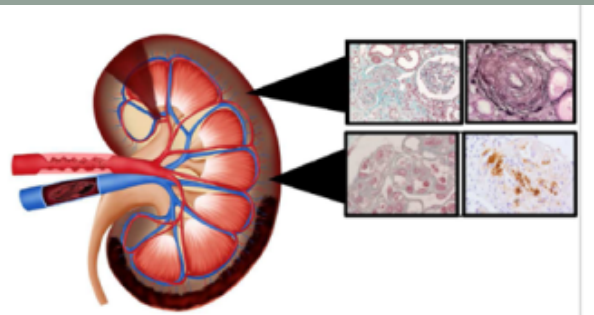
- For individuals with a normal baseline aPTT who are treated with unfractionated heparin, the aPTT can be used for monitoring
- For individuals with a normal baseline PT/INR, warfarin can be monitored by standard INR measurements

Routine monitoring of warfarin therapy is usually done in an anticoagulation clinic or with a combination of self-monitoring or self-management



Duration of anticoagulation

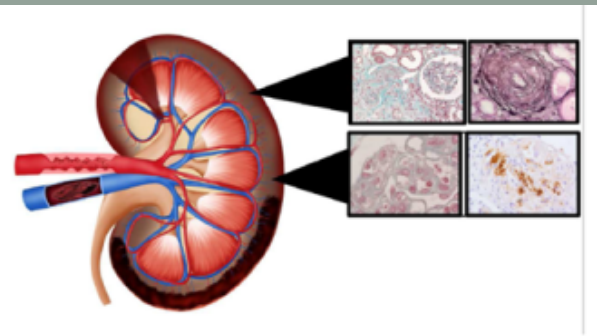
- For most individuals with APS and an unprovoked thrombotic event, we recommend lifelong anticoagulation



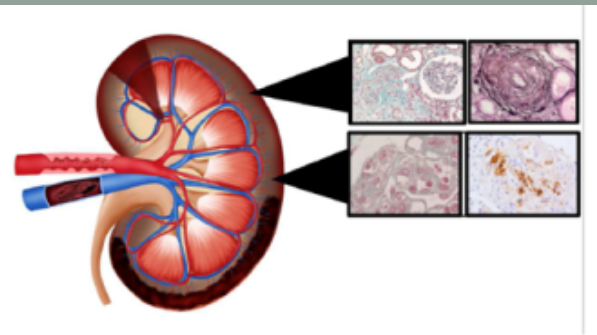
Duration of anticoagulation

- Stopping anticoagulation (3-6 m later) ?!
  - provoked thrombosis
  - especially in the setting of low titer aPL

Rituximab

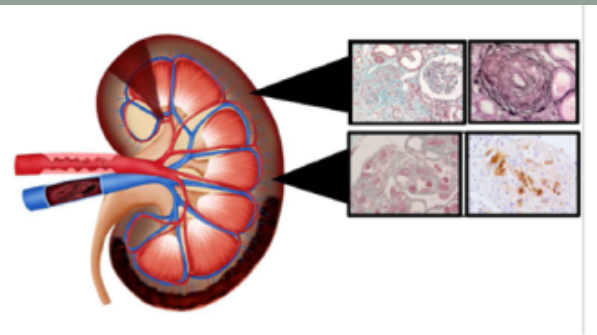


- Rituximab can be used in aPL-positive patients with hematologic manifestations (sever thrombocytopenia) or a TMA
- There are insufficient data to recommend routine use of rituximab in thrombotic APS



Hydroxychloroquine

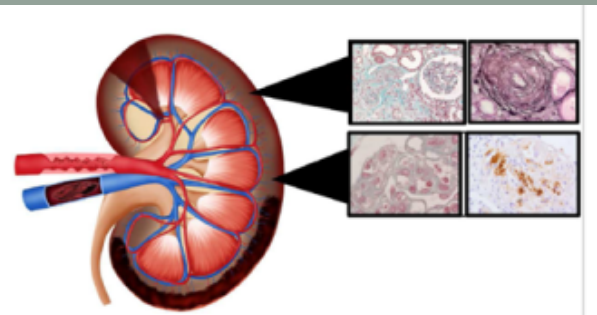
- HCQ can be used as an additional treatment in difficult-to-treat APS
- HCQ is used routinely in the treatment of SLE, but data are insufficient to recommend its use in the setting of APS or aPL without SLE
- In individuals with SLE and APS, HCQ appears to reduce the incidence of thrombotic complications, but it is not clear whether the reduction is due to treatment of the SLE or the APS



Statins

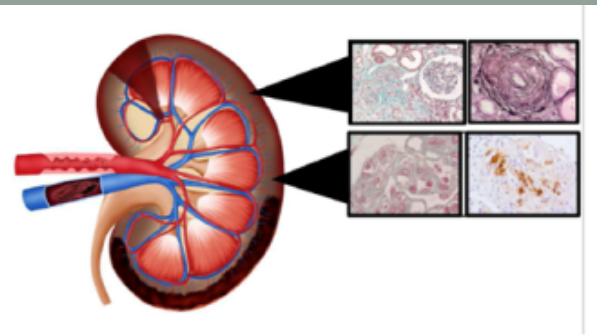
- Statins can be used as an additional treatment in difficult-to-treat APS
- Limited data suggest that statins may have a beneficial effect for patients with APS by reducing proinflammatory and prothrombotic markers
- There are insufficient data to recommend the routine use of statins in patients with APS in the absence of hyperlipidemia

Eculizumab

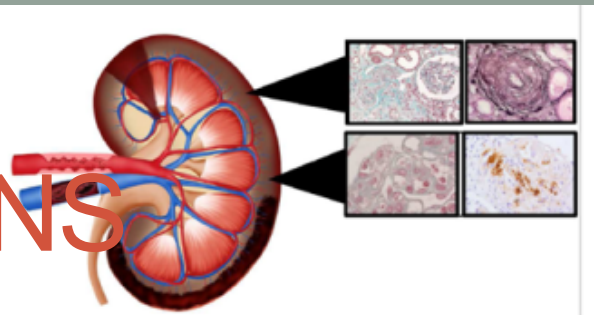


- Humanized monoclonal antibody against the C5, has been successful in rare anecdotal cases to treat recurrent thromboses after kidney transplantation
- Eculizumab has been used in refractory APS

Recurrent thromboembolism despite adequate anticoagulation



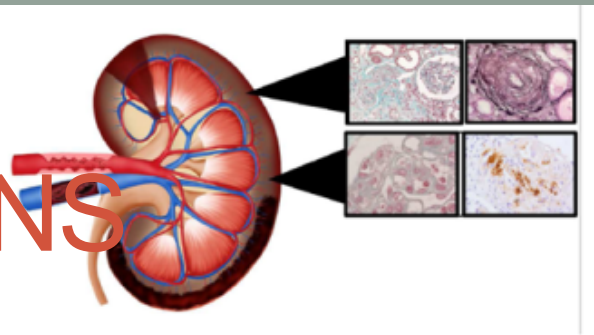
- It is important to determine that the patient was therapeutically anticoagulated with warfarin at the time of the event
- It is also important to evaluate for other possible reversible thrombosis risk factors and address these if present
- If the recurrent thrombosis occurred despite a documented adequate INR (range 2 to 3) and without an additional major thrombosis risk factor), one approach is to increase the target INR (range 3 to 4)



OTHER TREATMENT CONSIDERATIONS

Routine follow-up

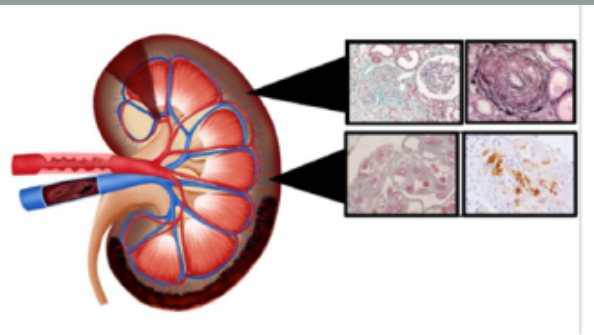
- Individuals with no other systemic autoimmune diseases who are otherwise tolerating anticoagulation are generally seen as an outpatient once or twice a year
- Routine laboratory monitoring is limited to coagulation studies ,a CBC, and a metabolic panel to assess kidney function



OTHER TREATMENT CONSIDERATIONS

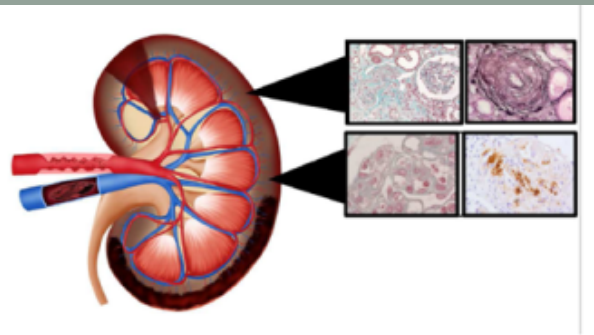
Routine follow-up…

- After the confirmation of persistent aPL positivity during the initial diagnosis of APS, repeat aPL testing is generally not indicated unless it will help with future treatment decisions
- Patients who are symptomatic from organ-system involvement (cardiac symptoms, kidney disease) should undergo appropriate evaluations based on their symptoms



Reduction of risk factors

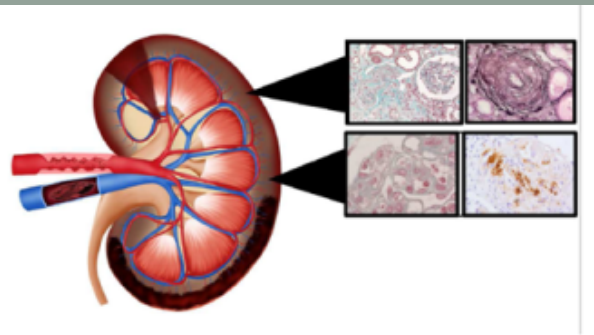
- During the perioperative period, risk reduction may include
  - minimizing the period when anticoagulation is interrupted
  - initiating early ambulation, and other measures to reduce venous stasis
- Estrogen-containing medications should generally be avoided when possible in individuals with APS



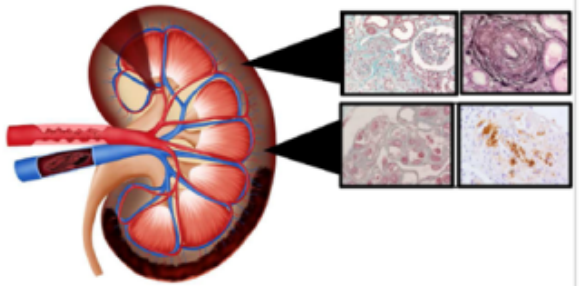
Management during pregnancy

- Warfarin is not used during pregnancy (especially the first trimester) due to the risks of teratogenicity
- Any individual with APS who becomes pregnant is treated with LMWH instead of warfarin

Prophylactic anticoagulation



- It is reasonable to administer prophylactic anticoagulation to some patients with aPL who have other conditions associated with high thrombotic risk
- Patients with APS who have membranous nephropathy may warrant prophylactic anticoagulation, even if nephrotic syndrome and low serum albumin concentrations are absent



Thank you!