Purpura Module

Module Instructions

- The following module contains hyperlinked information which serves to offer more information on topics you may or may not be familiar with. We encourage that you read all the hyperlinked information.

Purpura: Basic Facts

- Purpura results from extravasation of blood into the skin or mucous membranes
- It may be non-palpable (flat/macular) or palpable
- The type of lesion present is usually indicative of the underlying pathogenesis:
  - **macular purpura is typically non-inflammatory whereas palpable purpura is a sign of vascular inflammation (vasculitis)**

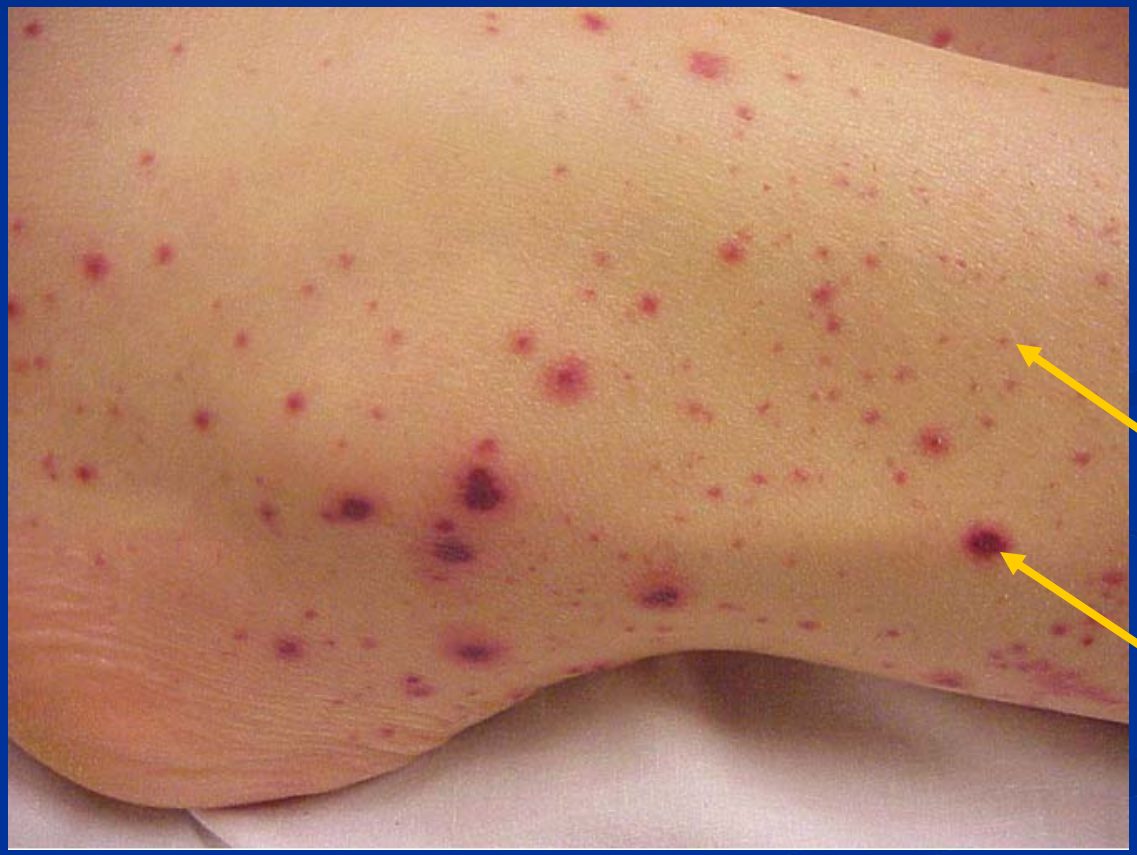
Purpura: Basic Facts

- Purpura may result from abnormalities in any of the three components of hemostasis:
  - Platelets
  - Plasma coagulation factors
  - Blood vessels

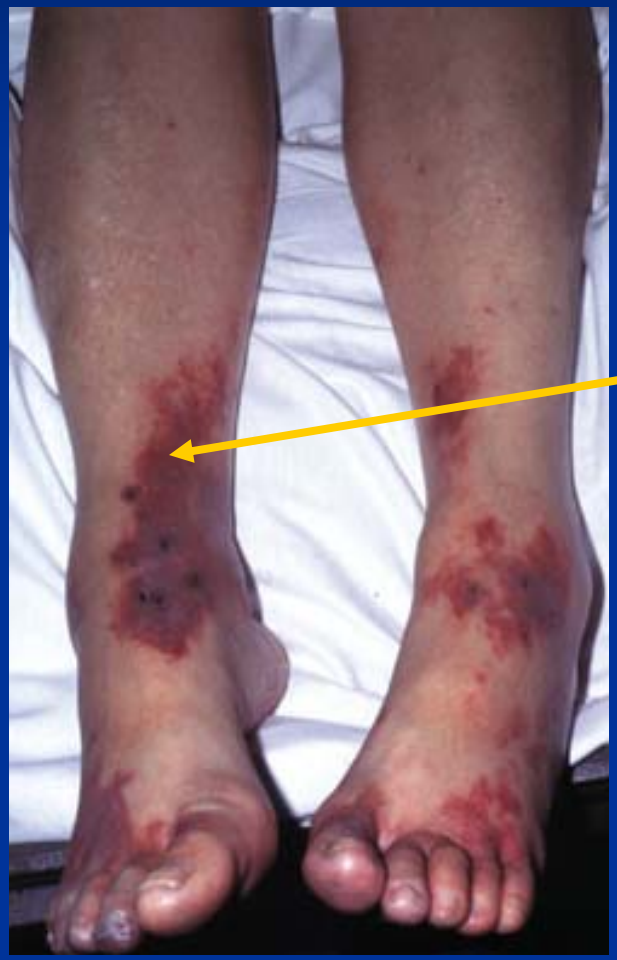
Macular (non-palpable) Purpura

- Macular purpura is divided into two morphologies:
  - *Petechiae* and *ecchymoses*
- The definition of the lesion types vary
  - Petechiae: small lesions (< 3 mm)
  - Ecchymoses: larger lesions
- All forms *fail to blanch* when pressed

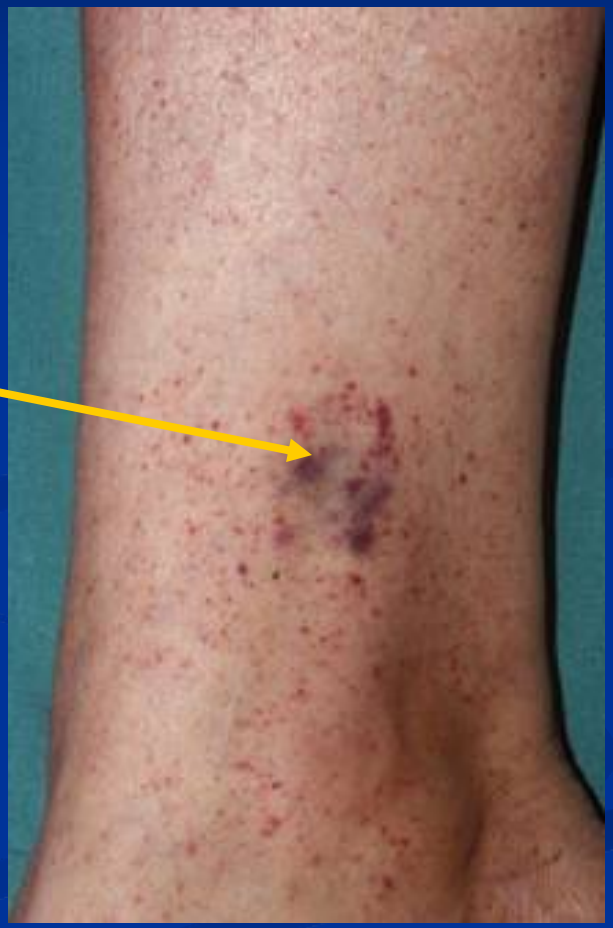
Petechiae and Purpura



Ecchymoses



Ecchymoses

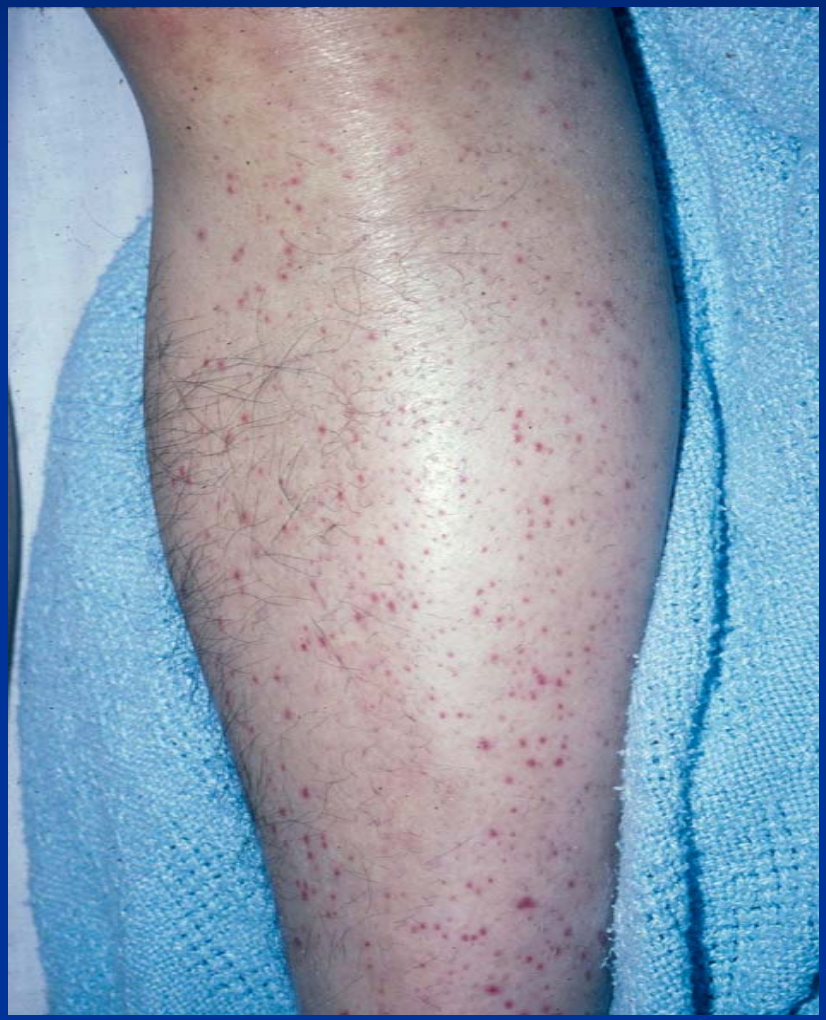


Case 1

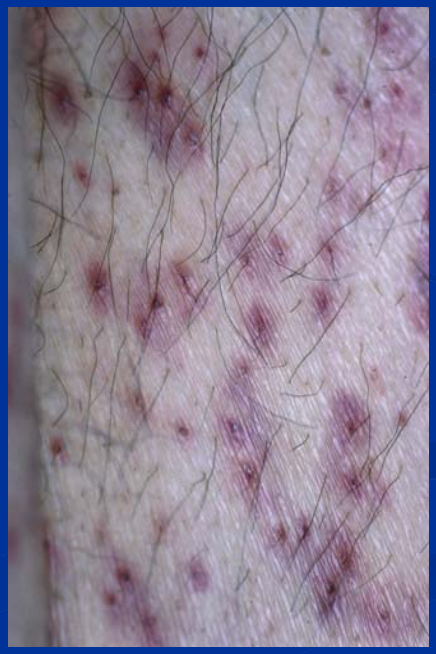
Case 1: History

- HPI: A 42 year old man presents to the ER with a 2 week history of a rash on his abdomen and lower extremities.

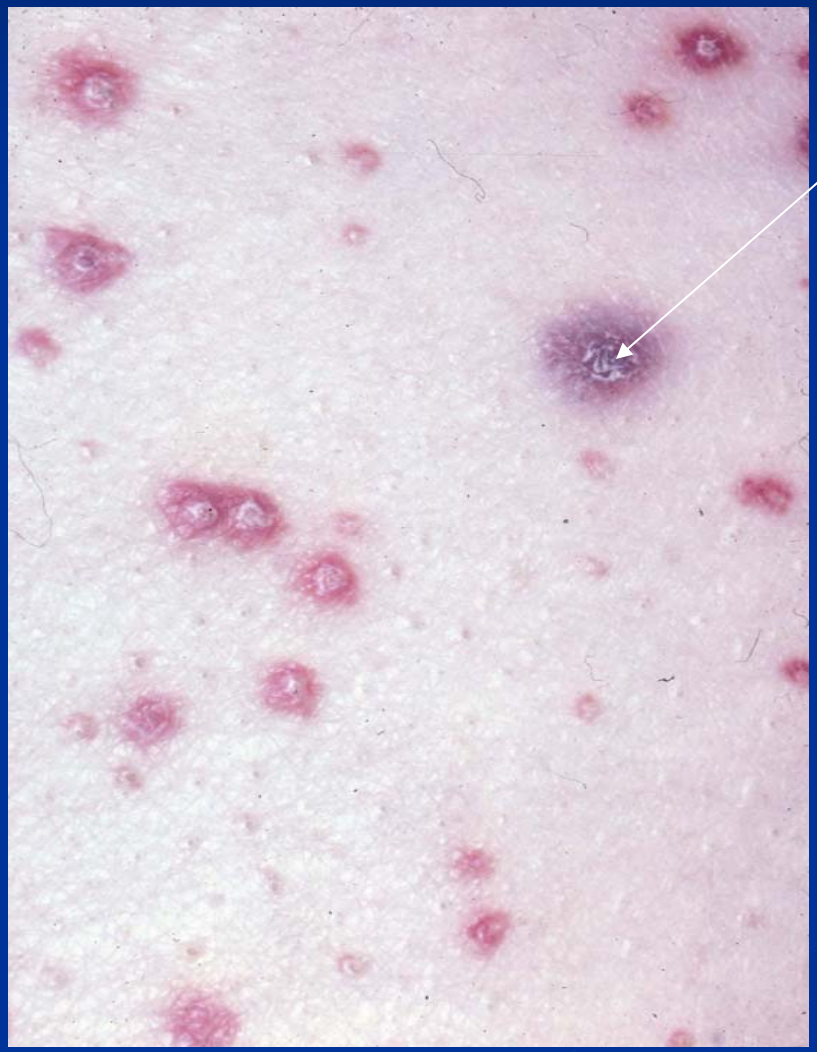
Case 1: Exam



On exam: scattered 40-50 perifollicular purpuric macules on the leg, some having a central hyperkeratotic papule

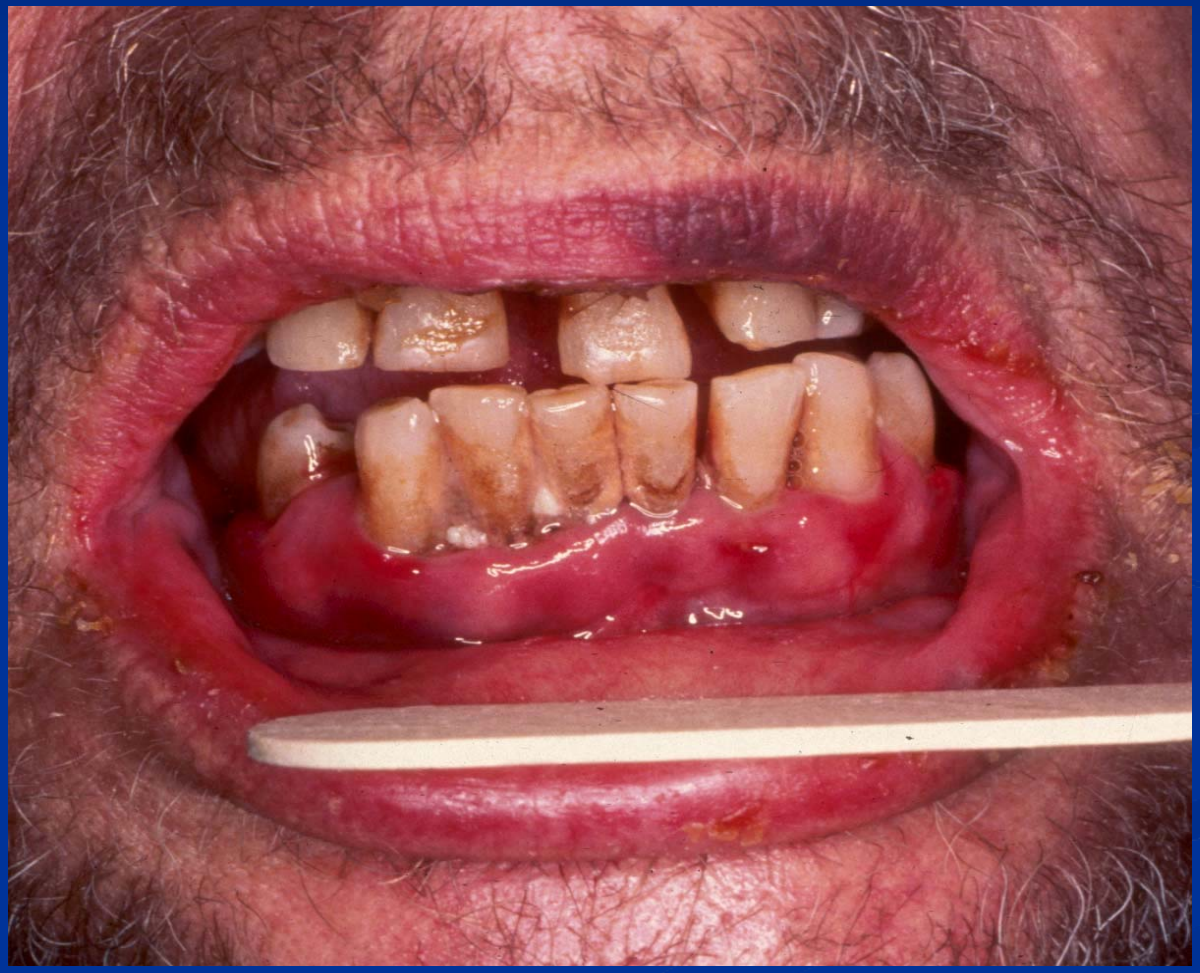


Case 1: Exam



On closer exam: pt has hyperkeratotic papules and a surrounding rim of purpura

Case 1: Exam



Exam cont: pt also has dystrophic gums as well as some focal areas of bleeding on the gums

Case 1: Question 1

- Which of the following historical items would you least like to know?

  a. social history

  b. dietary history

  c. medication history

  d. past medical history

  e. family history

  f. pet exposures

Case 1: Question 1

Answer: f

- Which of the following historical items would you least like to know?

  a. social history

  b. dietary history

  c. medication history

  d. past medical history

  e. family history

  f. pet exposures

Case 1: History

Further questioning of the patient reveals the following:

PMH: alcoholism, however he has not seen a doctor in 10 years

Meds: none

FH: non-remarkable

SH: divorced and lives alone, alcoholic for 14 years

Diet: He primarily eats toast, pop tarts, soup and microwave popcorn, but eating hurts his mouth and makes his gums bleed

Case 1: Question 2

- Which of the following is the most likely diagnosis?

  a. drug hypersensitivity reaction

  b. urticaria

  c. insect bites

  d. rocky mountain spotted fever

  e. nutritional deficiency

Case 1: Question 2

Answer: e

- Which of the following is the most likely diagnosis?

  a. drug hypersensitivity reaction (would not expect purpuric lesions)

  b. urticaria (would expect wheals, not purpuric lesions)

  c. insect bites (would expect erythematous papules with possible excoriation, but not surrounding pupura)

  d. rocky mountain spotted fever (no history of travel)

  e. nutritional deficiency

Diagnosis: Scurvy

- Scurvy is Vitamin C deficiency
  - There are many sources of vitamin C, most prominently citrus fruits
- Vitamin C is required for normal collagen structure and its absence leads to skin and vessel fragility
  - Vessel and skin fragility leads to bleeding and purpura
- Scurvy results from inadequate nutrition due to fad diets, social disadvantage, or psychiatric disease

Exam Findings of Scurvy

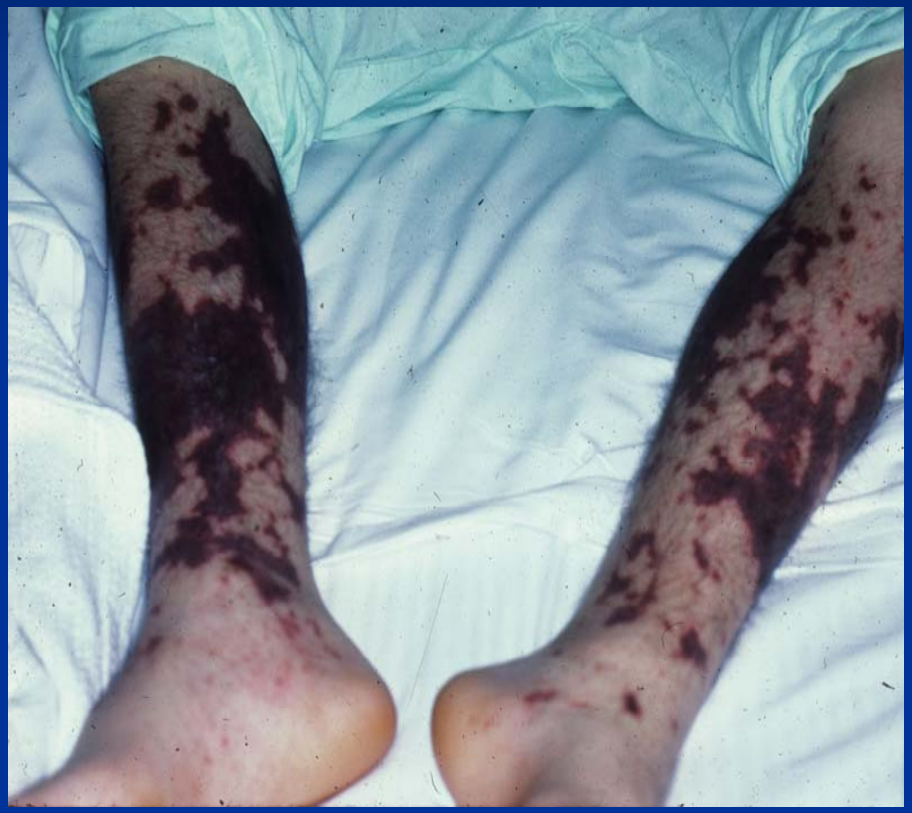
- Characteristic exam findings include:
  - perifollicular purpura
  - large ecchymoses on the lower legs
  - intramuscular and periosteal hemorrhage
  - keratotic plugging of hair follicles
  - hemorrhagic gingivitis
- Take a dietary history in every patient with purpura!

Case 2

Case 2: History

- HPI: 19 yo man is admitted to the hospital with a headache, stiff neck, high fever, and a rash. He has had a fever, nausea, vomiting for several days prior to admission.
- PMH: none
- All: none
- Meds: none
- FH: non-remarkable
- SH: lives in a college dormitory
- ROS: fever, night sweats, headache, stiff neck

Case 2: Exam



On exam,

VS: T-102.4, HR-120, BP-82/40, RR-22, O2 sat 96%

Gen: ill appearing lying on a gurney

HEENT: + nuchal rigidity

Skin: large ecchymotic patches covering much of the patient's lower extremities. Scattered ecchymotic patches are found throughout his exam. His extremities are cold in temperature

Case 2: Labs

- WBC count-14,000
- Decreased fibrinogen
- Increased PT, PTT time
- Blood Culture: gram negative diplococci

Case 2: Question 1

- What is the most needed treatment at this time?

  a. plasmaphoresis

  b. IV antibiotics

  c. vicodin

  d. IV corticosteroids

Case 2: Question 1

Answer: b

- What is the most needed treatment at this time?

  a. plasmaphoresis (the problem is not immune complex mediated and thus this will not help)

  b. IV antibiotics (may be started before lumbar puncture)

  c. vicodin (pain is not the patient's primary isssue)

  d. IV corticosteroids

DIC Treatment

- The patient in this case had disseminated intravascular coagulation (DIC) secondary to meningococcemia
- The presence of petechial or purpuric lesions in the patient with meningitis should raise concern for septicemia or DIC.
- DIC results from unregulated intravascular clotting resulting in depletion of clotting factors and bleeding
  - The primary treatment is always to treat the UNDERLYING CONDITION
  - Platelet transfusion, fresh frozen plasma, vitamin K are options for treatment but they do not correct the underlying cause

Causes of DIC

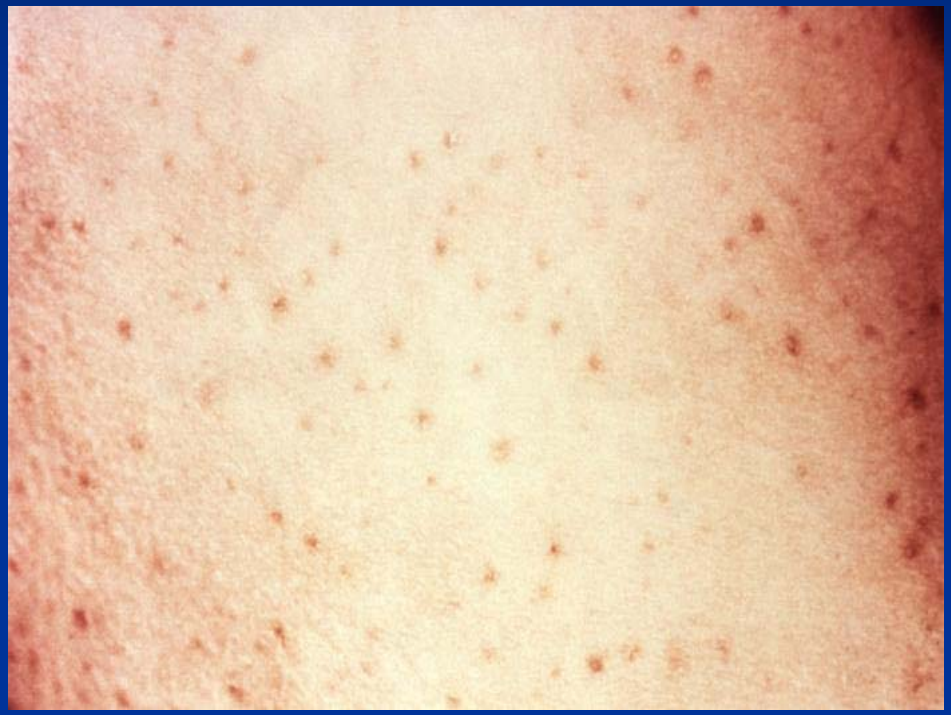
- DIC can be caused by a variety of disorders including:
  - Sepsis
  - Malignancy
  - Obstetric crisis (amniotic fluid embolus, placental abruption)
  - Anti-phospholipid syndrome with or without lupus

Case 3

Case 3: History

- HPI: An 18 yo women presents with bruising and “purple spots” as well as her gums bleeding for the past 3 weeks. She feels she has always bruised more easily than her friends.
- PMH: none
- All: none
- Meds: none
- FH: non-remarkable
- SH: lives at home in the city

Case 3: Exam



On exam:

Gen: well appearing in NAD

HEENT: pale mucous membranes with a currently bleeding nose

Skin: patient has 10-20 scattered petechiae and 3-5 ecchymotic patches on her arms, legs and torso

Case 3: Labs

- CBC was drawn and revealed:
  - Normal WBC
  - Normal Hct
  - Normal hemoglobin
  - PLATELETS of 38,000.

Case 3: Question 1

- What is the most likely diagnosis?

  a. DIC

  b. idiopathic thrombocytopenic purpura

  c. thrombotic thrombocytopenic purpura

  d. hemophilia

Case 3: Question 1

Answer: b

- What is the most likely diagnosis?

  a. DIC (pt is not acutely ill)

  b. idiopathic thrombocytopenic purpura

  c. thrombotic thrombocytopenic purpura (pt is not acutely ill)

  d. clotting disorder (no family history, would expect more ecchymotic bleeding and large bleeds)

Idiopathic Thrombocytopenia Purpura

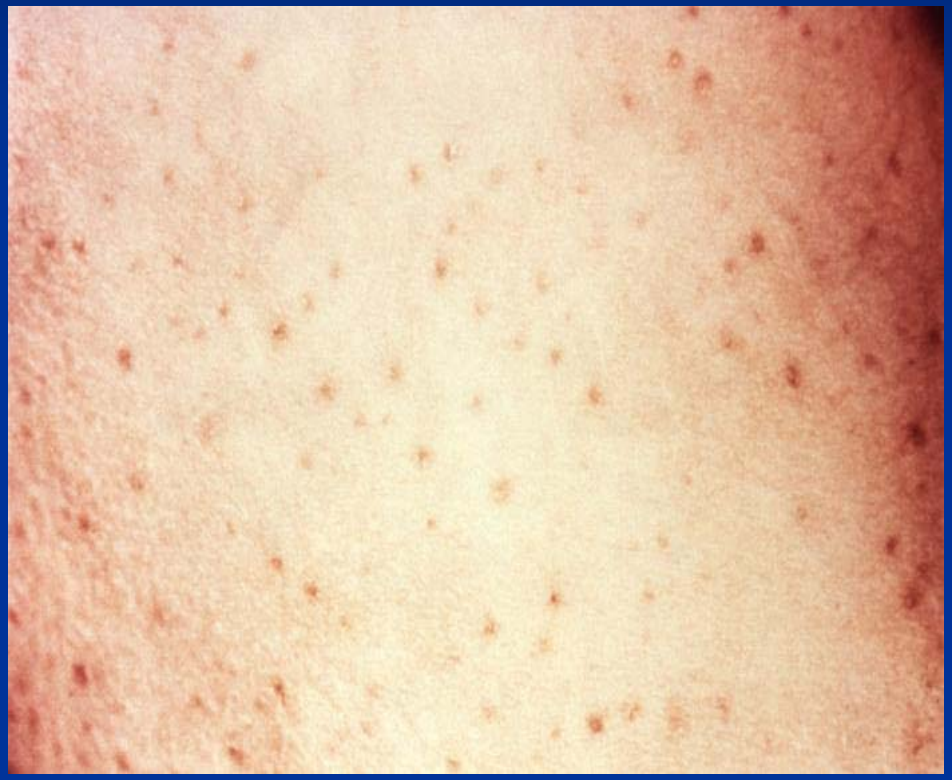
- Also known as ITP or autoimmune thrombocytopenic purpura
  - Results from autoimmune attack on platelets from IgG antibodies
  - Bleeding occurs at PLATELETS <50,000
- There are two forms, chronic and acute with chronic being more common in adults
  - Chronic forms affect women more so than men
  - Acute form affects children and follows a viral infection 50% of the time, particularly parvovirus
- Prognosis is typically good with a low mortality associated
- Treatment includes IVIg, systemic corticosteroids and other immune modulators, while splenectomy remains the gold standard treatment

Case 4

Case 4: History

- HPI: 38 year old man is brought in to the emergency room by his wife after he had a seizure. He has had a fever and abdominal pain as well as a dark red rash over the last few days.
- PMH: s/p CABGx3 last month
- All: none
- Meds: plavix (started last month)
- FH: non-remarkable
- SH: lives with his wife

Case 4: Exam



On exam:

Gen: ill appearing in some respiratory distress

HEENT: pale mucous membranes with a currently bleeding nose

Abd: +bs, soft, non-tender, non distended, with splenomegaly

Skin: patient has 10-20 scattered petechiae and 3-5 ecchymotic patches on his arms, legs and torso

Case 4: Labs

- Hct: 29
- Platelets: 22,000
- PT, PTT normal
- Cr: 1.6

- Blood smear reveals schistocytes

Case 4: Question 1

- What is the most likely diagnosis?

  a. DIC

  b. idiopathic thrombocytopenic purpura

  c. thrombotic thrombocytopenic purpura

  d. hemophilia

Case 4: Question 1

Answer: c

- What is the most likely diagnosis?

  a. DIC (PT and PTT would be elevated)

  b. idiopathic thrombocytopenic purpura (would be less severe)

  c. thrombotic thrombocytopenic purpura

  d. hemophilia (would not have systemic findings other than bleeding)

Thrombotic Thrombocytopenia Purpura

- TTP is a far more serious form of thrombocytopenia which includes: thrombocytopenia, hemolytic anemia, renal abnormalities, fever, CNS distrubance
- On exam, ecchymoses, jaundice, and an enlarged spleen are common
- Diagnosed by gingival biopsy or bone marrow biopsy

Thrombotic Thrombocytopenia Purpura

- TTP can be caused by pregnancy, cancer, drugs, HIV, or toxins
  - In this case, plavix was the likely cause
- TREATMENT: Plasma exchange of 3-5L for 4-10 days results in 80% survival
  - Splenectomy may be required for recurrent disease
- DELAY IN TREATMENT CAN LEAD TO A 90% MORTALITY!

More on Non-Palpable Purpura

Causes of Non-palpable Purpura

- Thrombocytopenia
- High intravascular venous pressures
  - Violent vomiting, coughing, childbirth, seizures, blood pressure cuff, stasis
- External trauma
- Skin weakness/fragility
  - Solar purpura
  - Genetic collagen diseases
- Vitamin deficiency
  - vitamin C
  - vitamin K
- Drugs

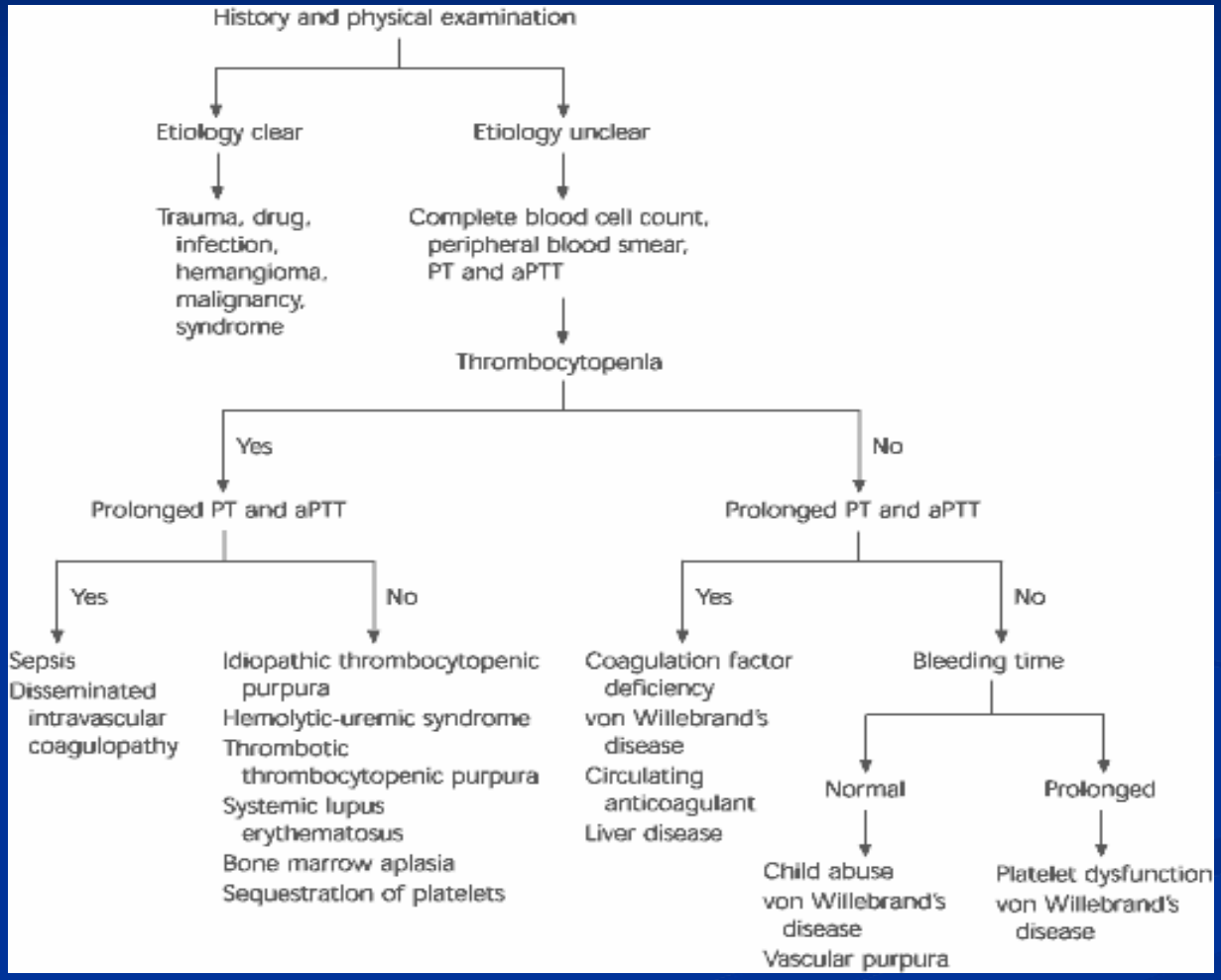
Drugs causing Purpura

- Drugs: may alter platelet function (ASA), platelet number or enhance the anticoagulant effects of other drugs:
  - ASA and NSAIDs
  - Quinine
  - Herbals- garlic, ginkgo, ginger, ginseng, tumeric, dong quai, meadowsweet, willow and feverfew
    - Patients may be on herbal medications at the time of surgery and increase bleeding risk. It may help to ask patients if they are on herbal medications for surgeons, anesthesiologists, and others.
      - Chang, LK, Whitaker DC: The impact of herbal medicines on dermatologic surgery. Dermatol Surg 2001;27:759.
- Drugs may also cause autoimmune thrombocyopenia
  - Sulfonamides, digoxin, quinine, chlorothiazides, penicillin, acetaminophen, allopurinol, furosemide, rifampin, lidocaine

Drugs causing Purpura

- Also, be aware of heparin induced thrombocytopenia (HIT) and warfarin necrosis (from thrombi and clotting, in the case of warfarin necrosis it is through initial inhibition of protein C)
  - Treatment is removal of offending agent
  - Steroids can be helpful

Algorithm for Diagnosis



This diagram although used for children with purpura it also applies to adults

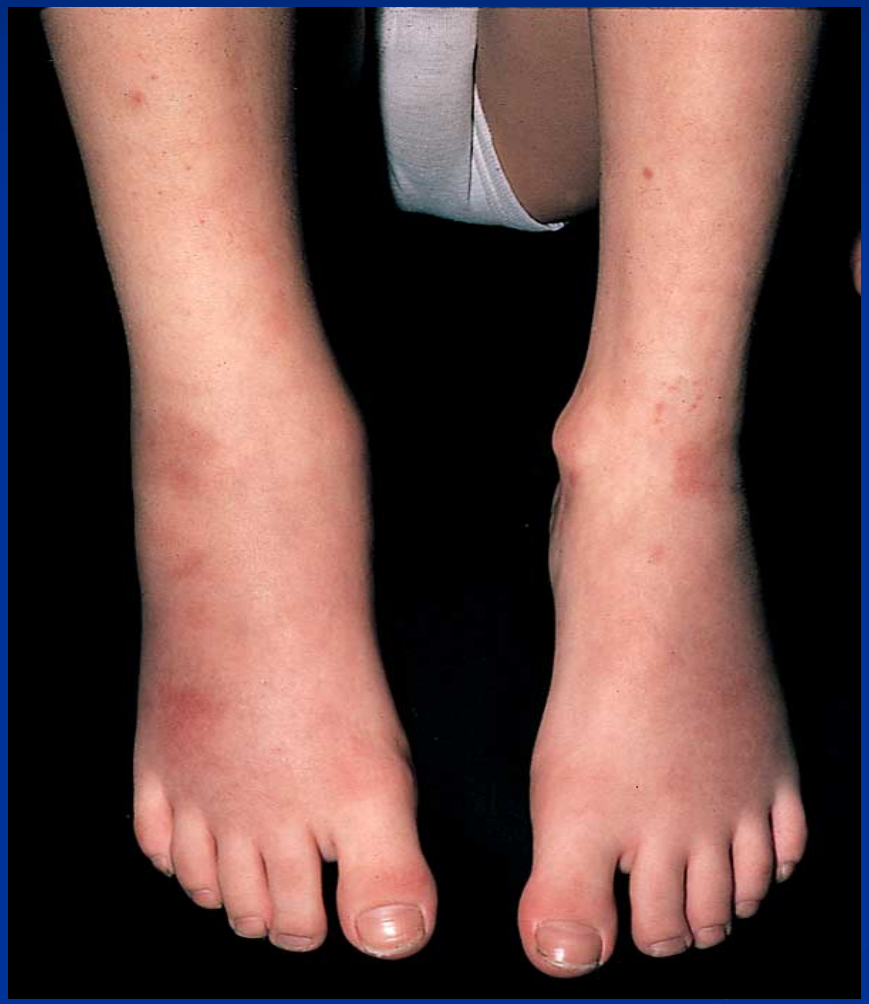
Cohen AR. Rash--purpura. In: Fleisher GA, Ludwig S, et al., eds. Textbook of pediatric emergency medicine. 3d ed. Baltimore: Williams & Wilkins, 1993: 430-8

Case 5

Case 5: History

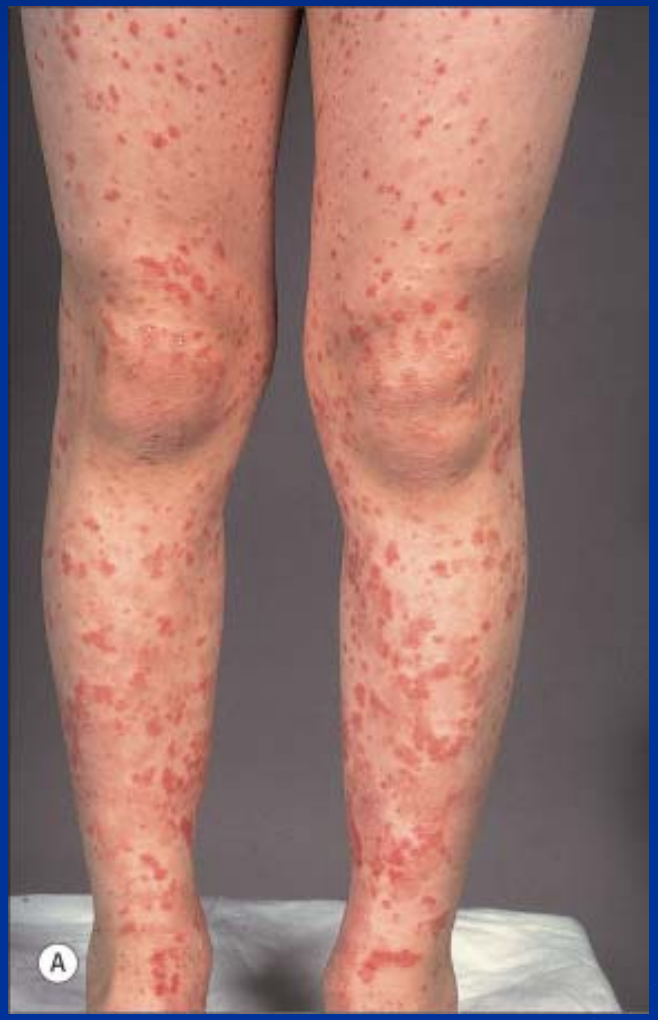
- HPI: A 9 year old girl with a 4 day history of abdominal pain and a rash on the lower extremities presents to the ER. She states that the rash was acute in onset and accompanied by joint pain of the knees and ankles and aching abdominal pain. Over 3 days it changed from red patches to more diffuse purple bumps.
- Remainder of history non-remarkable except for a cough and runny nose she had 2 weeks ago

Case 5: Exam (3 days prior to presentation)



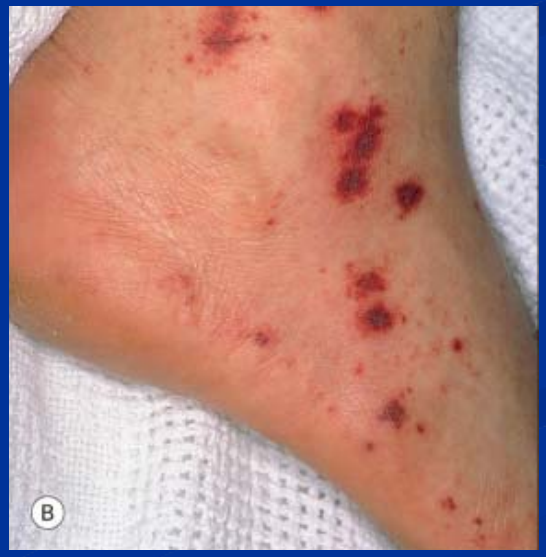
On exam, pt has scattered erythematous macules and patches on the legs bilaterally

Case 5: Exam (current)



Gen: T-99.3F

On exam, pt has purpuric, non-blanching macules and papules on both legs and feet sparing the trunk, upper extremities and face



Case 5: Question 1

- In this clinical context, what test will establish the diagnosis?

  a. HIV test

  b. white blood cell count

  c. ESR

  d. urinalysis

  e. chest X-Ray

  f. skin biopsy for routine microscopy and direct immunofluorescence

Case 5: Question 1

Answer: f

- In this clinical context, what test will establish the diagnosis?

  a. HIV test

  b. white blood cell count

  c. ESR

  d. urinalysis

  e. chest X-Ray

  f. skin biopsy for routine microscopy and direct immunofluorescence

Skin Biopsy

- A skin biopsy obtained from a new purpuric lesion reveals a leukocytoclastic vasculitis of the small dermal blood vessels
- Direct immunofluorescence demonstrates perivascular IgA, C3 and fibrin deposits
- BIOPSY IS OFTEN NECESSARY TO DIAGNOSE PALPABLE PURPURA!

Case 5: Question 2

- What is the most likely diagnosis?

  a. metastatic melanoma

  b. DIC

  c. Henoch Schonlein Purpura

  d. ITP

  e. sepsis

Case 5: Question 2

Answer: c

- What is the most likely diagnosis?

  a. metastatic melanoma

  b. DIC

  c. Henoch Schonlein Purpura

  d. ITP

  e. sepsis

Henoch Schonlein Purpura

- HSP is the most common form of vasculitis in kids
- The peak age of onset is 4 to 7 years
- The classically described tetrad of HSP includes purpura (vasculitis), musculoskeletal disease (arthritis), gastritis and nephritis
- HSP also occurs in adults, but less frequently
- HSP follows a seasonal pattern with a peak in incidence during the winter presumably due to association with a preceding viral or bacterial infection

Henoch Schonlein Purpura

- Biopsy shows small vessel vasculitis
- Immune complexes in vessel walls contain IgA (the diagnostic feature of HSP)
- Treatment is supportive +/- prednisone
- Natural History: complete recovery in 90% or more, but some develop progressive renal disease (more common in adults)

Palpable Purpura: Basic Facts

- Palpable purpura results from underlying blood vessel inflammation, referred to as *vasculitis*
- Vasculitis may be idiopathic or secondary to a medication, infection, neoplasm or systemic inflammatory disease
- Vasculitis is typically classified by the vessel size affected (small, medium, mixed size or large)

Question

- If a patient presents with urticarial lesions and is diagnosed as having a vasculitis, what is the likely vessel size affected?

  a. small vessel

  b. medium vessel

  c. large vessel

Question

Answer: a

- If a patient presents with urticarial lesions and is diagnosed as having a vasculitis, what is the likely vessel size affected?

  a. small vessel

  b. medium vessel

  c. large vessel

Palpable Purpura: Basic Facts

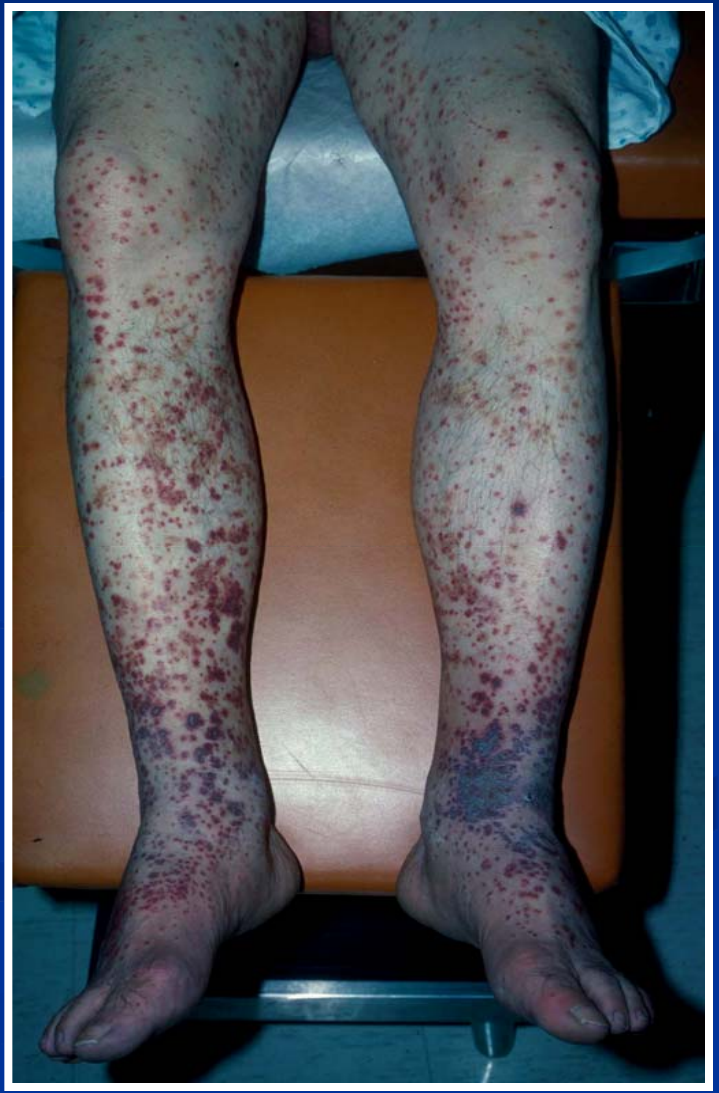
- The size of the vessel affected by the vasculitis often determines what symptoms the patient will experience
  - Small vessel disease (postcapillary venules) causes urticarial lesions and palpable purpura
  - Small artery disease causes subcutaneous nodules
  - Medium sized disease can cause necrosis of organs
  - Large vessel disease can cause claudication and necrosis

Palpable Purpura: Pathogenesis

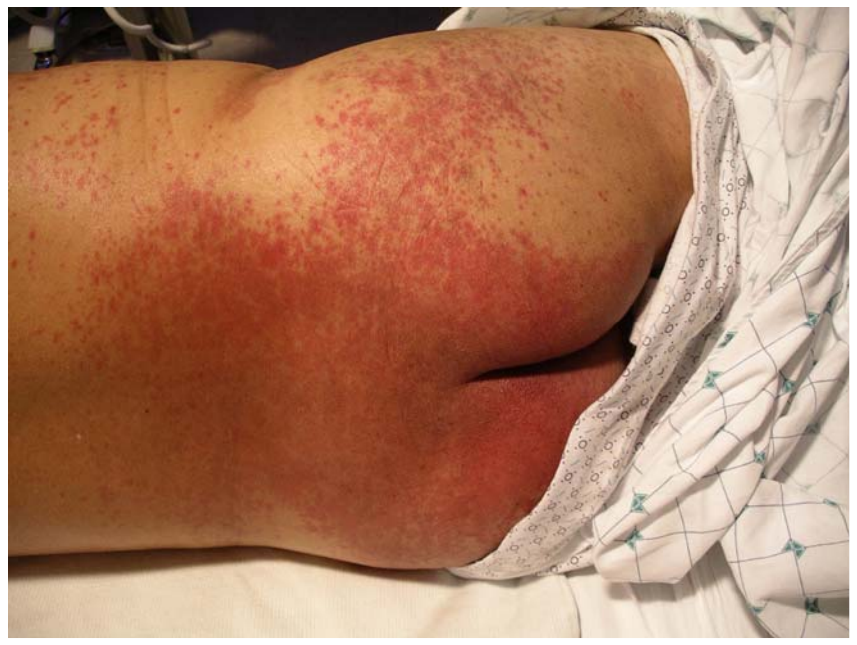
- Palpable purpura is thought to be mediated by immune complex deposits in vessel walls
  - Group A Strep may be an antigen forming an immune complex to cause vasculitis
  - Viral causes are also possible
  - Drugs may also trigger small vessel vasculitis

Palpable Purpura in Adults

- Degree of purpura increases from cephalad to caudad
- Favors dependent areas
- May itch, sting, or burn
- Associated symptoms: fever, malaise, arthralgias/arthritis
- May affect blood vessels in many organs
  - kidneys, joints, and gut



Palpable Purpura: Treatment in Adults



- Treat underlying cause
- First line
  - NSAIDS
  - Colchicine 0.6 mg BID
  - Dapsone 50-100 mg BID
  - Prednisone (60-80mg/day) for short course
- Second line
  - Mycophenolate mofetil, methotrexate, azathioprine, cyclophosphamide

Take Home Points

- Macular (non-palpable) Purpura is caused by bleeding into the skin and it is important to determine the underlying cause
  - Checking platelets, PTT, and PT is important
  - Clotting abnormalities, infection, and malignancy must be excluded
- Palpable purpura, or vasculitis, is from vessel wall inflammation and can be caused by a number of conditions
  - Biopsy is often necessary for diagnosis

END OF MODULE