



Brigham and Women's Hospital
Founding Member, Mass General Brigham

Board Review Practice 1 Images

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- Research focus: Imaging and Hemodynamics

NAMSA – clinical events committee

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HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Question 1

A 58 year old white male from Cape Cod sees his PCP with a lesion on his forehead which he noticed approximately 2 months previously. He is otherwise well and his examination is normal. The picture of the lesion is provided. The most likely diagnosis is:



- A. Freckle
- B. Melanoma
- C. Merkel's Cell Carcinoma
- D. Basal cell carcinoma
- E. Kerato-acanthoma

Question 1

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Skin Cancer Facts

- Non melanoma skin cancer most common cancer in the US
- BCC $\approx$ 75% nonmelanoma cancers
- Incidence of nonmelanoma skin cancer increasing in some areas of US
- **Risk Factors:**
 - Sun and UV radiation exposure (including tanning beds)
 - H/O sunburns.
 - Light complexion and eye color (fair skin that freckles and burns easily), light-colored eyes (blue, green, or other light-colored eyes), and light-colored hair (red or blond)
 - Family history or personal history of BCC, SCC, actinic keratosis, familial dysplastic nevus syndrome, or atypical nevi.
 - Chronic cutaneous inflammation.
 - Immune suppression. e.g., s/o organ Tx
 - Other environmental exposure. Arsenic



Skin Cancer



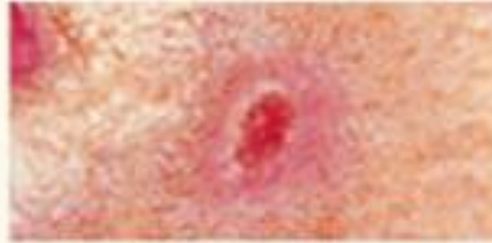
Melanoma



Squamous Cell Carcinoma



Atypical Mole



Basal Cell Carcinoma



Actinic Keratosis



Merkel Cell Carcinoma

Basal cell carcinoma



Squamous cell carcinoma



Basal Cell Ca.

Numerous types of basal cell carcinoma

- nodular, cystic, pigmented, morphoeic (infiltrative) and ulcerated
- the most important feature is that of margin definition: clearly or ill defined
- Rarely metastasize (SCC – to- regional LNs)
- Slow growing, locally invasive (SCC-faster growing)
- Usually affect white people



SOURCE: <https://maxfacts.uk/diagnosis/a-z/cancer/facial-skin/more-info>

Question 2

An 18-year-old young man presents with 3-day history of acute-onset, violaceous, painful toes. No association with cold, no transientness to discoloration, no rash, arthralgias. PMH: negative. Hands and fingers unaffected.

CBC, ESR, Coag panel (PT, PTT), D-dimer, Chem 7, LFTs, ANA, UA WNL. COVID-19 PCR negative



Question 2 (cont'd)

The most likely diagnosis is

- A.) Raynaud's phenomenon
- B.) Acrocyanosis
- C.) COVID-19 infection-induced chilblains
- D.) Lupus associated skin vasculitis
- E.) Thrombotic microangiopathy



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Raynaud's, Pernio's, and Acrocyanosis

Raynaud's

- Characterized by paroxysmal episode of triphasic or biphasic color change (white, red and bluish discoloration) of finger and toes.

Chilblain or Pernio

- Develop after cold exposure in digits with erythematous and purplish discoloration. Itching, burning and pain often present unlike acrocyanosis
- Edema of the digits and tenderness

Acrocyanosis

- Persistent abnormally - deep blue or cyanotic discoloration of skin over extremities - decreased oxyhemoglobin
- Functional peripheral vascular disorder
- More prevalent in children and young adults usually <30 years old
- Risk factors: cold climate, outdoor occupation, low body mass index (BMI)
- Causes: Autoimmune, Malignancy (Paraproteinemia, Castlemann's), Psych (schizophrenia, eating disorders), Neuro (spinal injury, brachial plexus, cervical plexus).
- Diagnosis - capillaroscopy, which visualizes capillary venous stasis



Coronavirus (Covid 19) Infection-induced Chilblains: A case report with histomorphologic finding



Fig 1. Coronavirus disease 2019—induced chilblains. Violaceous infiltrated plaques that appeared abruptly on an erythematous background, with features typical of chilblains.

COVID-19 toes

Several skin manifestations have been linked to COVID-19 infection.

Adolescents and young adults, otherwise are asymptomatic.

Several hundred sets of “COVID toes” in the US during thru teledermatology

Classic red to purplish coloration on the dorsal aspect of the toes, sometimes with small nodules.

Less common - circular or ring-like lesions on the plantar or lateral aspects of the feet or toes, and involvement of the fingers (traditional pernio/chilblains typically involves fingers).

Superficial blisters and erosions may develop.

Lesions may be asymptomatic, but many are pruritic or painful, particularly when touched. Toes may be swollen and too painful to wear shoes.

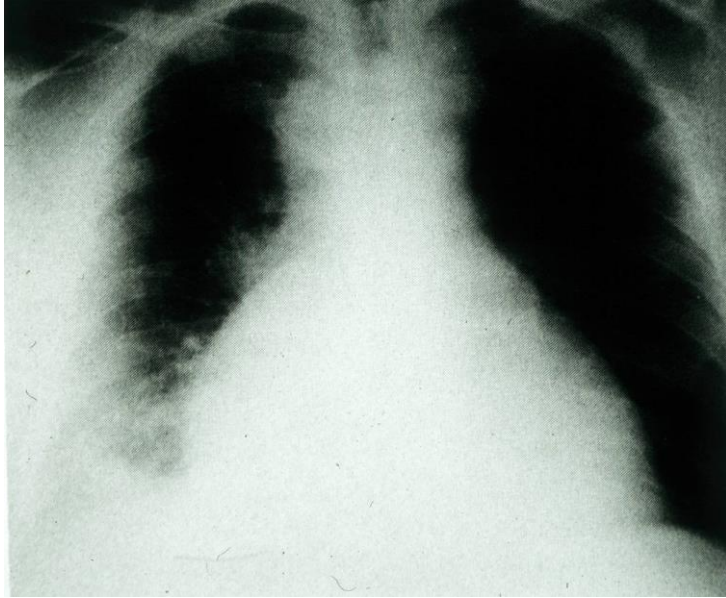
Lesions typically last 10 to 14 days, but several have reported to be persistent for a few months already.

Biopsies to date are consistent with pernio

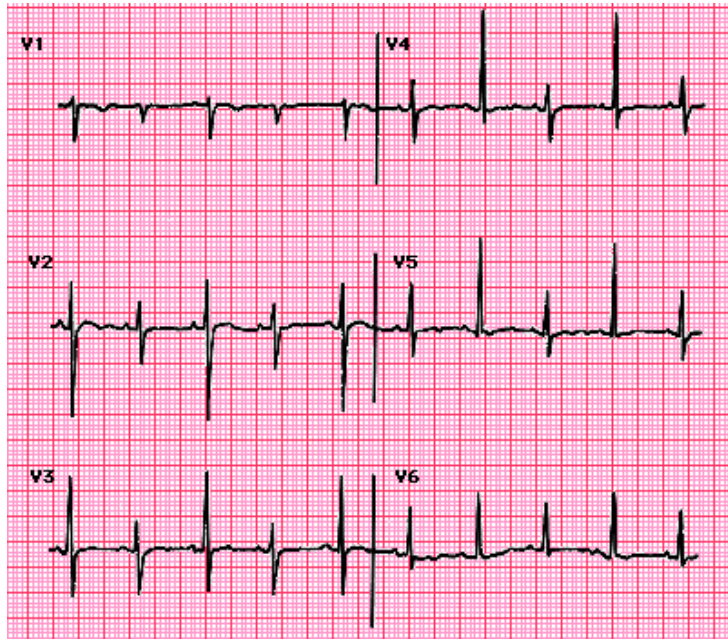


SOURCE: Amy Paller: <https://www.practiceupdate.com/content/chilblain-like-lesions-on-feet-and-hands-during-the-covid-19-pandemic/99772>

Question 3

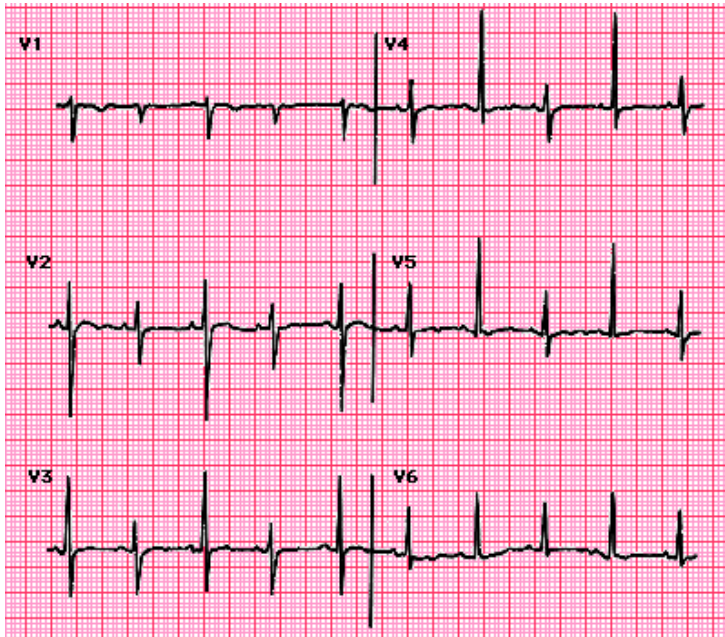
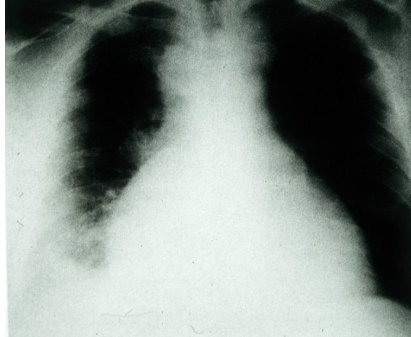


A 52 year old homeless man on chronic dialysis with a history of non-compliance presents with chest pain. CXR and EKG show the following. The next step should be:



- A. Administer prednisone 60 mg/day tapered over 1 month.
- B. Emergency pericardiocentesis and initiate heparin-free daily hemodialysis
- C. Anticoagulate the patient immediately with heparin
- D. Administer colchicine
- E. Administer vitamin B6

Question 3



Electrical alternans Sinus Tachy w/ beat to beat variation in QRS appearance (best seen V2 and V4)

Source: Ary Goldberger, MD

cmbi.bjmu.edu.cn

- ✓ **B. Emergency pericardiocentesis and initiate heparin-free daily hemodialysis**

Uremic pericarditis w/ tamponade

- inflammation of the visceral and parietal membranes of the pericardial sac.
- BUN is usually >60 mg/dL
- Risk factors: inadequate dialysis and/or fluid overload .
- Fever and pleuritic chest pain - worse in the recumbent position. pericardial rub is generally audible but is frequently transient.
- Signs of cardiac tamponade may be seen, particularly in patients with rapid pericardial fluid accumulation.
- EKG does not show the typical diffuse ST and T wave elevations observed with other causes of acute pericarditis. This results from the lack of penetration of the inflammatory cells into the myocardium

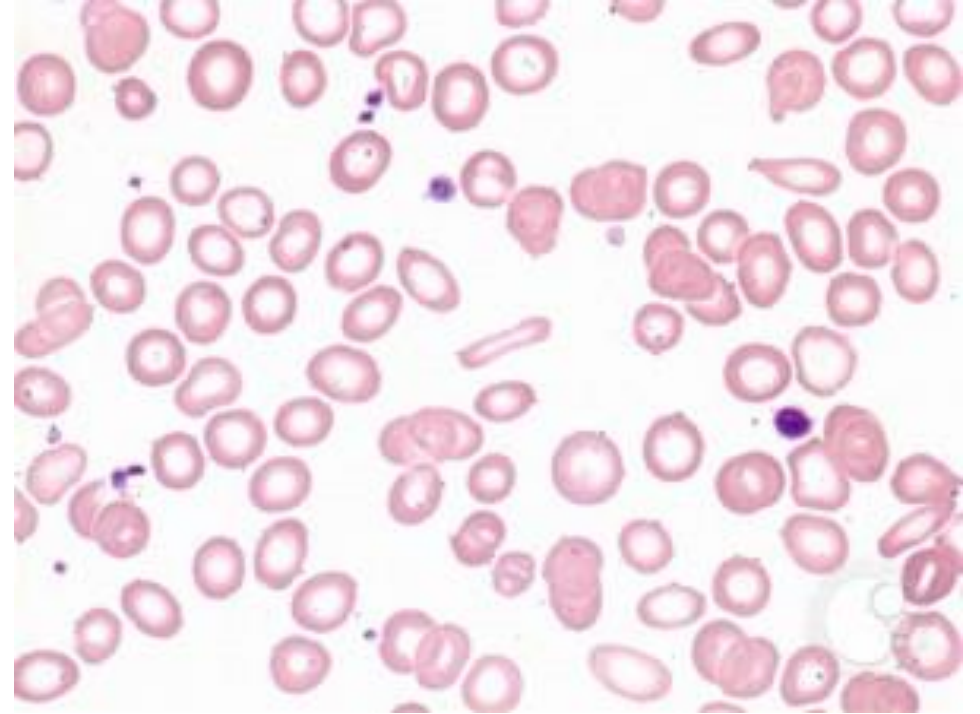
Question 4

An 88-year-old woman sees you for her routine annual physical. She feels fine, but on review of systems does admit to tiredness that is relatively new in onset (≈ 3 months duration). She denies any stool per rectum. She says her diet is mostly vegetarian and she has been eating less than she normally does.

Vitals are normal (BP 132/80 mmHg), pale mucosa. Otherwise normal.

Lab data: Hb 8.9 g/dL, HCT 27%, Mean corpuscular volume (MCV) 65 fl, Mean corpuscular Hb conc (MCHC) 26%. Red cell distribution width RDW=16.7%. The blood smear is shown.

Choose the single best:



- A. Anisocytosis
- B. Hypochromia
- C. Poikilocytosis
- D. Microcytosis
- E. All of the above



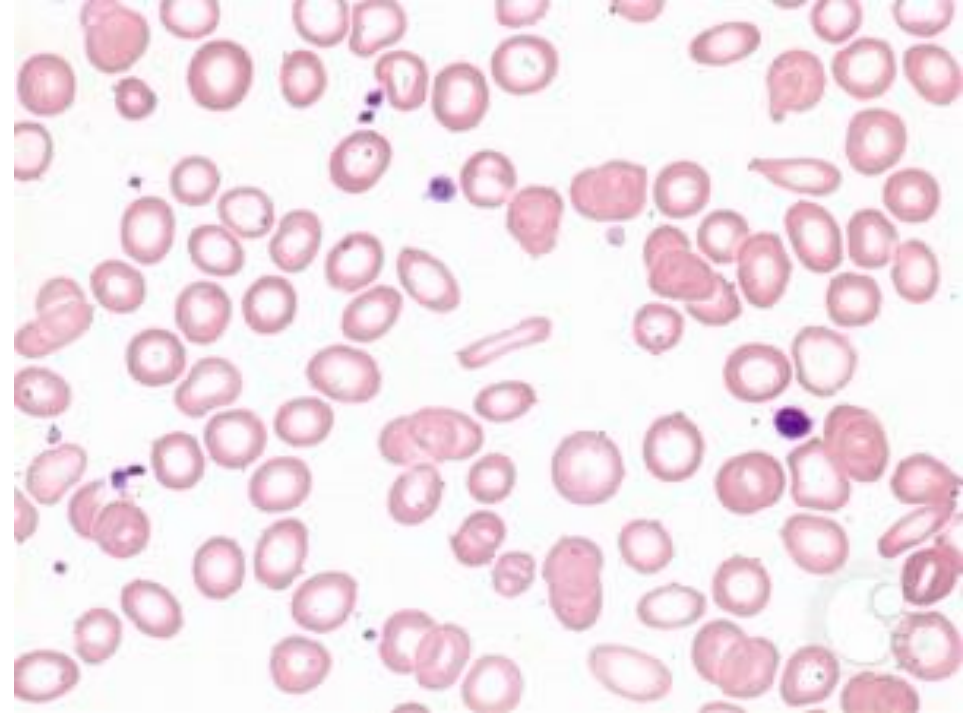
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Anemia Facts

Hypochromia= pale

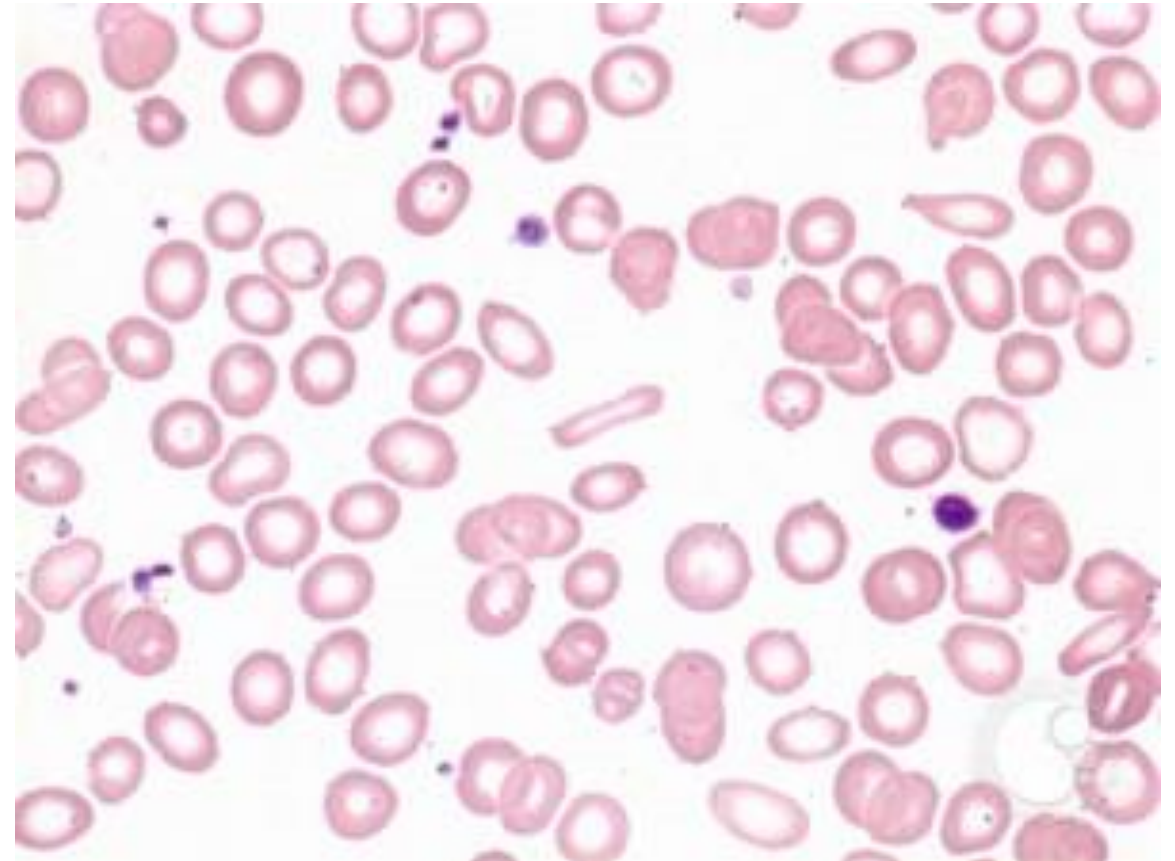
Microcytosis = small

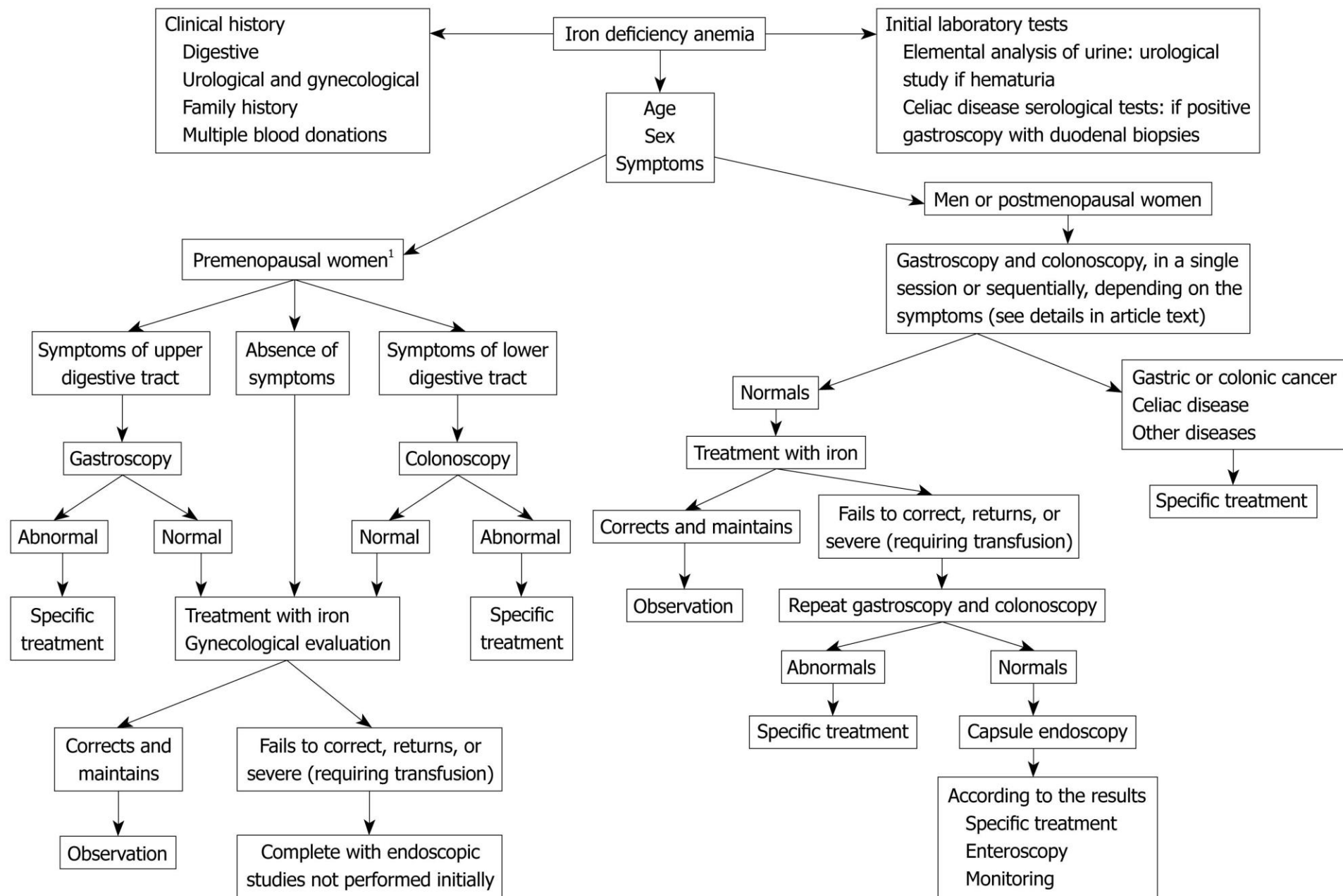
Anisocytosis = unequal

Poikilocytosis = abnormal shapes

Degree of anisocytosis $\approx$ red cell distribution (RDW).

Next step = perform iron studies (TSAT, Ferritin), fecal occult blood, colonoscopy





Question 5



A 68 year old woman has a long history of rheumatoid arthritis (RA). Which one of the following deformities is not characteristically seen in RA?

- A. Boutonnière deformity
- B. swan- neck deformity
- C. Ulnar deviation of the metacarpophalangeal joints
- D. Bouchard's nodes
- E. Mallett Finger



Question 5

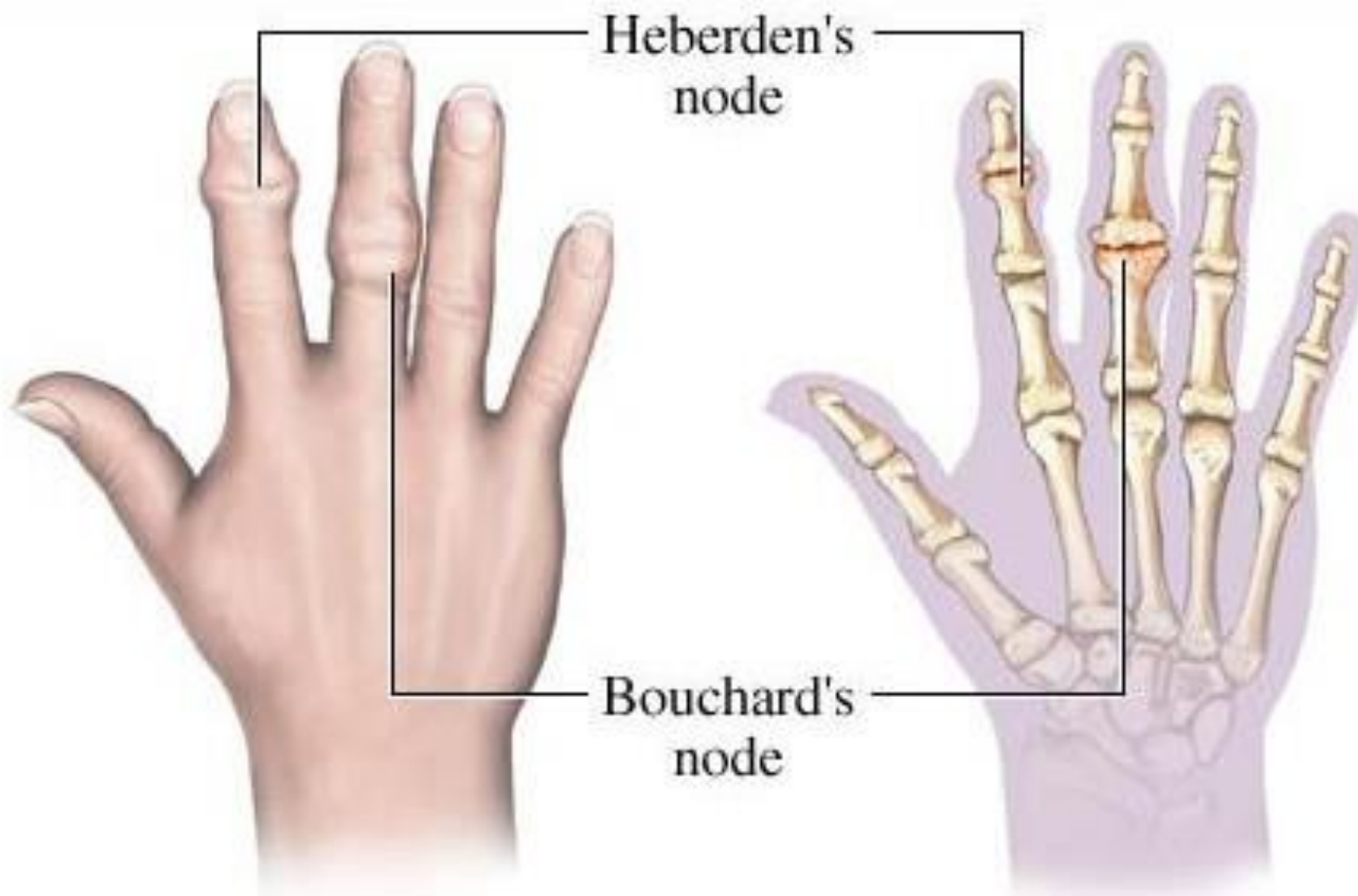


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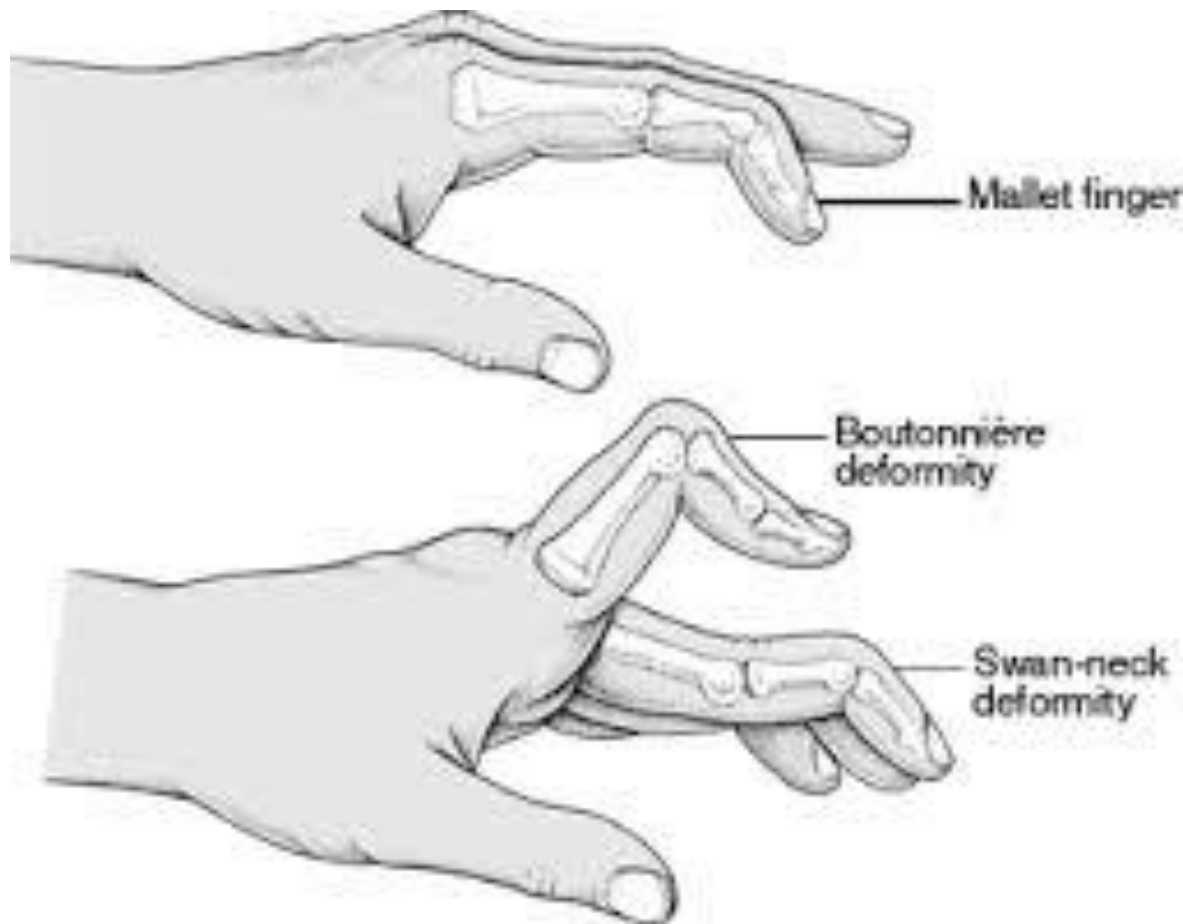
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Osteoarthritis (OA) hand abnormalities



RA hand abnormalities

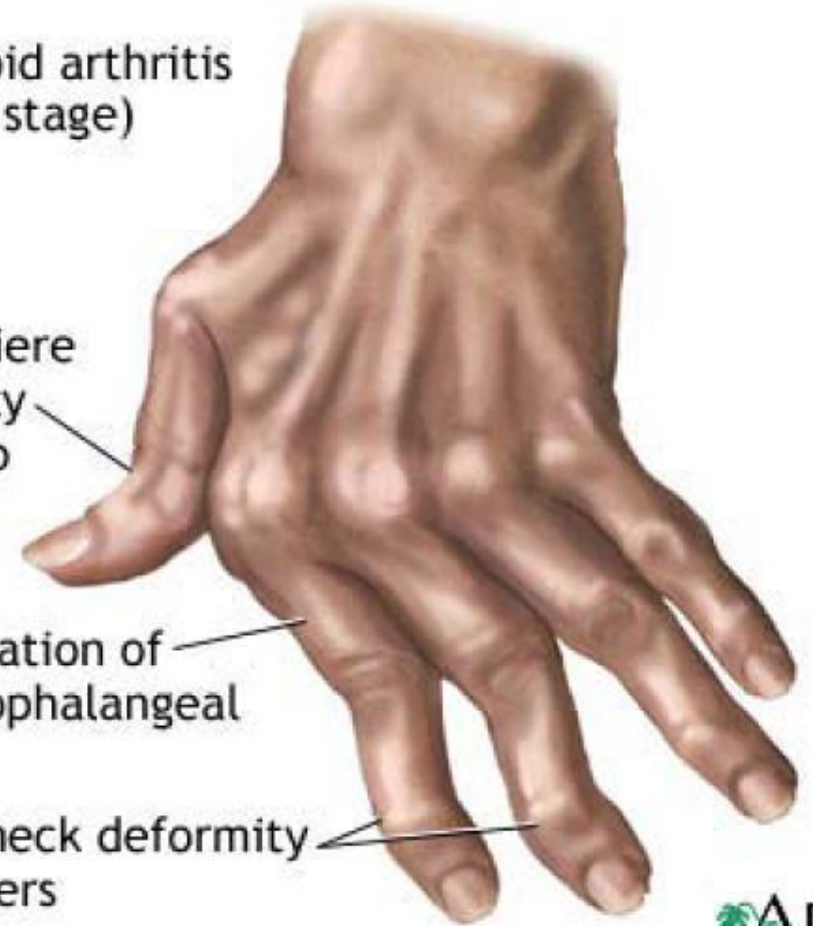


Rheumatoid arthritis
(late stage)

Boutonniere
deformity
of thumb

Ulnar deviation of
metacarpophalangeal
joints

Swan-neck deformity
of fingers



ADAM.

Question 6



Serum levels of which one of the following laboratory tests would be expected to be most abnormal in this patient?

- A. 17-hydroxyprogesterone**
- B. Angiotensin-converting enzyme**
- C. Anti-tissue transglutaminase antibody**
- D. Prolactin**
- E. Vitamin B6**

SOURCE:Graham McMahon and
<http://emedicine.medscape.com/article/361490-overview>

Question 6



B. Angiotensin-converting enzyme

Lupus pernio is a manifestation of sarcoidosis that involves the nasal bridge and cheeks.

The CXR shows bilateral hilar lymphadenopathy.

Serum levels of the angiotensin-converting enzyme are elevated in the majority of patients with untreated sarcoidosis.

SOURCE:Graham McMahon and
<http://emedicine.medscape.com/article/361490-overview>

ACE Levels

ACE levels may be elevated in $\approx$ 60% of patients at the time of diagnosis.

Non-caseating granulomas (NCGs) secrete ACE: the enzyme is secreted by epithelioid cells at the periphery of the granulomas, and the level is usually elevated in patients with “active” sarcoidosis. Serum ACE levels may correlate with total body granuloma load.

Levels may be increased in fluid from bronchoalveolar lavage or in cerebrospinal fluid.

- Also in pts with miliary tuberculosis, silicosis, asbestosis, biliary cirrhosis, leprosy, histoplasmosis, hepatitis, lymphoma, berylliosis, diabetic retinopathy and hyperthyroidism.
- **Sensitivity and specificity as a diagnostic test is limited** (60% and 70%). **There is no clear prognostic value.**
- Serum ACE levels may decline in response to therapy.
- **Decisions on treatment should not be based on the ACE level alone.**



Question 7



What is the most likely diagnosis?

- A. Amyloidosis**
- B. Celiac disease**
- C. Hypothyroidism**
- D. Kawasaki disease**
- E. Type 2 diabetes**

Question 7



B. Celiac disease

Atrophic glossitis is a typical manifestation of celiac disease.

The tongue was the most frequently affected site in a series of 128 patients with celiac disease who were examined for oral mucosal lesions and symptoms, with 29.6% of the patients describing soreness or a burning sensation and 8.6% having erythema or atrophy.¹

Pastore L, et al, N Engl J Med 2007; 356:2547
<http://www.nejm.org/doi/full/10.1056/NEJMc070200#t=article>

¹R. Docimo, M. Costacurta, P. Maturo, L. Di Iorio, F.M. Paone. (2009) Malattia celiaca e manifestazioni intraorali. *Prevenzione & Assistenza Dentale* **35**, 26-33

Other Manifestations of Celiac Disease in the Oral Cavity¹

Dental enamel defects with a various degree of advancement: discolorations, horizontal groves and pits, and structural destruction causing the change of the dental crown.

Symmetric location of defects within all dentition sections, and within the same anatomic groups of teeth (the most frequently: incisors and first permanent molars), is specific for celiac disease.

Recurrent aphthae and other disorders of the oral mucosa such as ulceration, erythema, atrophic glossitis, as well as dryness and a burning sensation (particularly of the tongue)

Delayed tooth eruption may also be a consequence of alimentary deficiency in celiac disease.



¹Krzywicka B, Herman K, Kowalczyk-Zajac M, Pytrus T. Celiac disease and its impact on the oral health status - review of the literature. Adv Clin Exp Med. 2014 Sep-Oct;23(5):675-81.



Nature Reviews | **Gastroenterology & Hepatology**

Leffler, DA et al Extraintestinal manifestations of coeliac disease *Nature Reviews Gastroenterology & Hepatology* 12, 561–571 (2015)



Question 8



This 53-year-old college professor could no longer lecture because her tongue kept getting in the way. Her tongue was enlarged and had serrations, reflecting imprints of her teeth. Her upper-torso muscles were grossly hypertrophied and hard as wood

The most likely diagnosis is:

- A. Acromegaly**
- B. Hypothyroidism**
- C. Amyloidosis**
- D. Pernicious anaemia**
- E. An allergic reaction to toothpaste**

Question 8



C. Amyloidosis

An enlarged, serrated tongue suggests amyloidosis, acromegaly, or hypothyroidism.

The “shoulder pad” sign, however, is relatively specific for amyloid disease.

Thus, the combination of an enlarged, serrated tongue with the "shoulder pad" sign is pathognomonic of systemic amyloidosis.

Localized Amyloidosis

Tongue is most frequently affected site in forms of localized amyloidosis

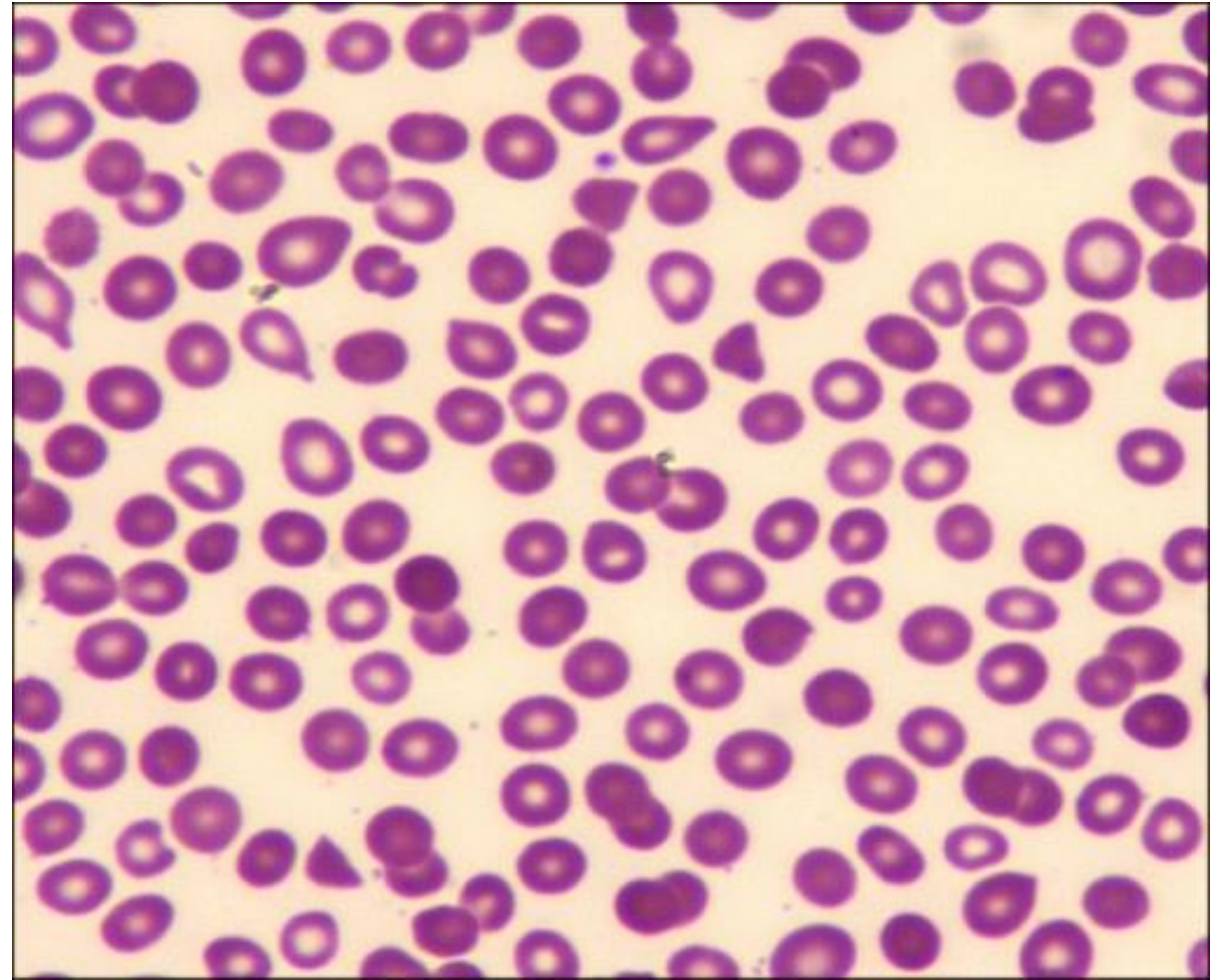
Tongue biopsy possess a highly diagnostic value for amyloidosis.

No consensus regarding the management of lingual amyloidosis, although numerous therapies have been proposed, including surgical excision and pharmacological treatment. However lesions often persist or recur.



Question 9

A 68-year-old man with a history of aortic stenosis s/p mechanical prosthetic aortic valve is noted to be anemic. A peripheral smear is done:
Match the correct image to the diagnosis



SOURCE:

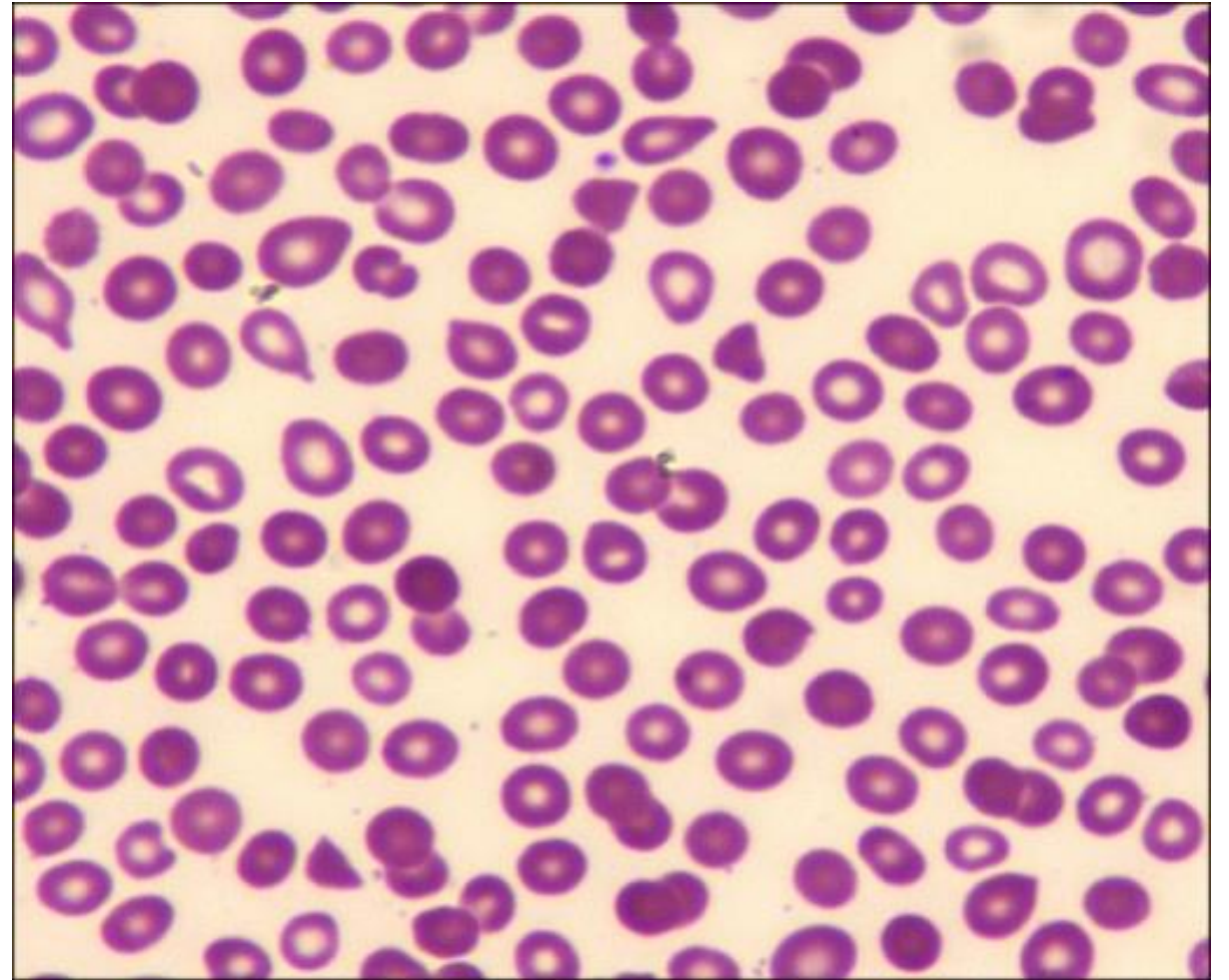
https://openi.nlm.nih.gov/detailedresult.php?img=PMC5054256_br-51-207-g001&req=4



Question 9

The image shows:

- A.) Schistocytes
- B.) Howell-Jolly bodies
- C.) Sickle cells
- D.) Burr cells
- E.) Normal cells



SOURCE:

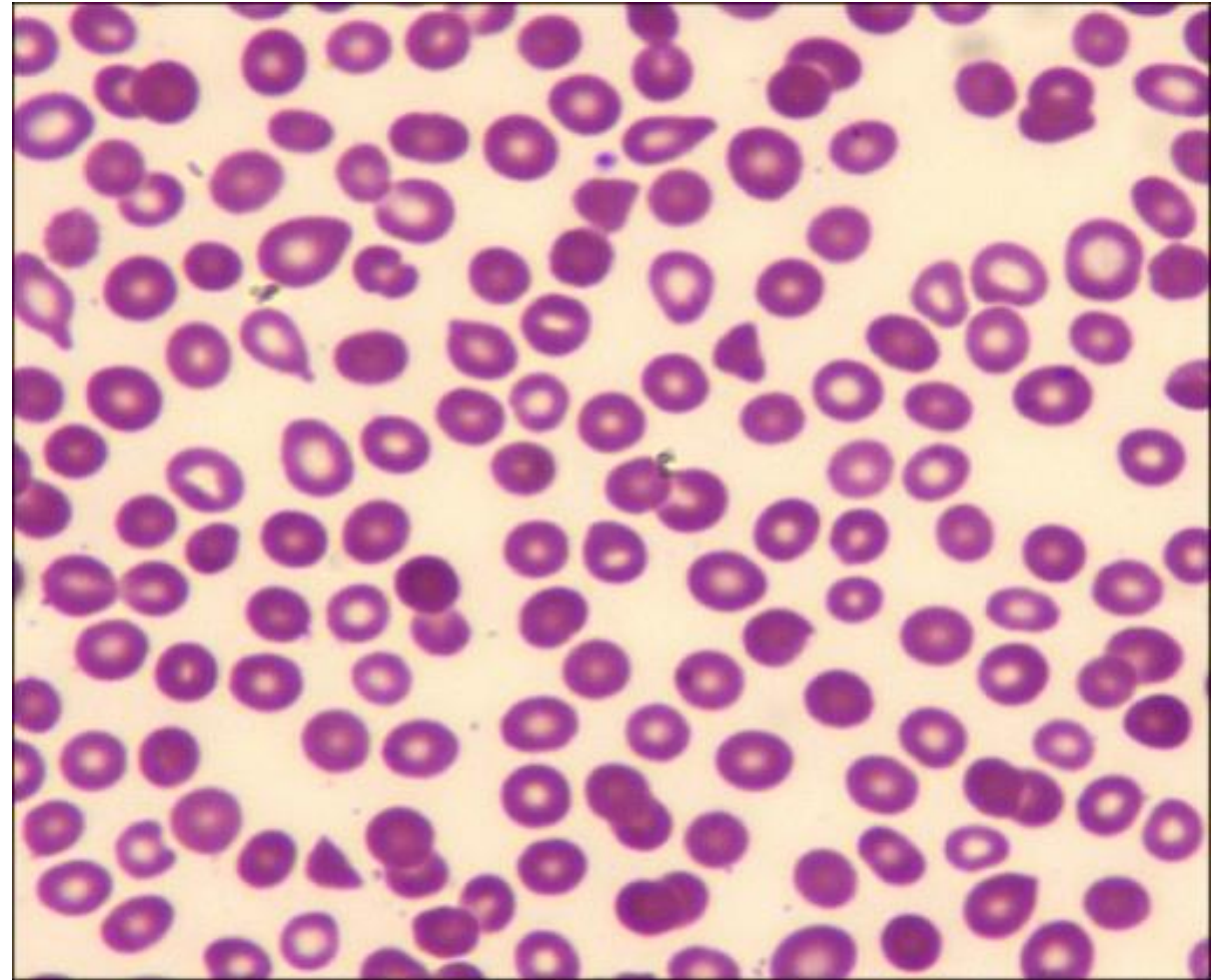
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Abnormal RBC Morphology	Cartoon Image	May be associated with
Microcytic RBC		Pyridoxine deficiency Thalassemia Iron deficiency anemia Chronic disease anemia (sometimes) Sideroblastic anemia (sometimes)
Macrocytic RBC		Vitamin B12 or Folate deficiency Liver Disease MDS Chemotherapy (e.g. methotrexate)
Spurr Cell RBC (Acanthocyte)		Abetalipoproteinemia Liver disease McLeod blood group phenotype Post-splenectomy Etc.
Burr Cell RBC (Echinocyte)		Artifact Uremia Liver disease Etc.
Schistocyte		Microangiopathic Hemolytic Anemia Mechanical valve induced Etc.
Bite Cell RBC		G6PD deficiency Unstable hemoglobin disorders Oxidative drugs
Elliptocyte		Hereditary elliptocytosis Severe iron deficiency anemia
Spherocyte		Hereditary spherocytosis Autoimmune hemolytic anemia
Stomatocyte		Hereditary stomatocytosis Liver disease
Target Cell RBC		Thalassemia Hemoglobinopathies Post-splenectomy Liver disease Artifact
Sickle Cell RBC		Hemoglobin SS disease Hemoglobin SC disease Hemoglobin SD disease S-beta thalassemia
Teardrop		Myelofibrosis Underlying marrow process/infiltrate Etc.
Hemoglobin C Crystals		Hemoglobin C disease Hemoglobin SC disease
Red Cell Agglutinate		Cold autoimmune hemolytic anemia Paroxysmal cold hemoglobinuria IgM associated lymphoma Multiple myeloma
Rouleaux		Chronic liver disease Malignant lymphoma Multiple myeloma Chronic inflammatory diseases

Common RBC Inclusions	Cartoon Image	Inclusion	May be associated with
Howell Jolly Bodies		DNA	Hyposplenism Asplenism Severe hemolytic anemia
Heinz Bodies		Hemoglobin	G6PD deficiency Oxidant drugs Unstable hemoglobin
Pappenheimer Bodies		Iron deposits	Thalassemia Sideroblastic anemia Hemolytic anemia Post-splenectomy
Hemoglobin H Inclusion		Hemoglobin	Hemoglobin H disease
Basophilic Stippling		Ribosomes	Lead poisoning Thalassemia Sickle cell anemia MDS

SOURCE: <https://laboratoryinfo.com/variatiions-in-red-blood-cell-morphology/>

