

# Coagulopathy Case - 4

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# CLINICAL HISTORY

- A 46-year-old woman S/P appendectomy. Patient developed postoperative wound infection shortly after appendectomy and received antibiotics for this. Now patient begins to bleed from the surgical wound. Pre-operative coagulation screen tests (before appendectomy) were normal.
- The patient had not previously been hospitalized, with the exception of obstetric admissions.
- Family history was negative for any bleeding problems.
- The patient had been taking Glucophage for adult-onset diabetes and Amlodipine for hypertension.

# PHYSICAL EXAMINATION

- Physical examination revealed bleeding from the surgical wound with no obvious signs of infection.

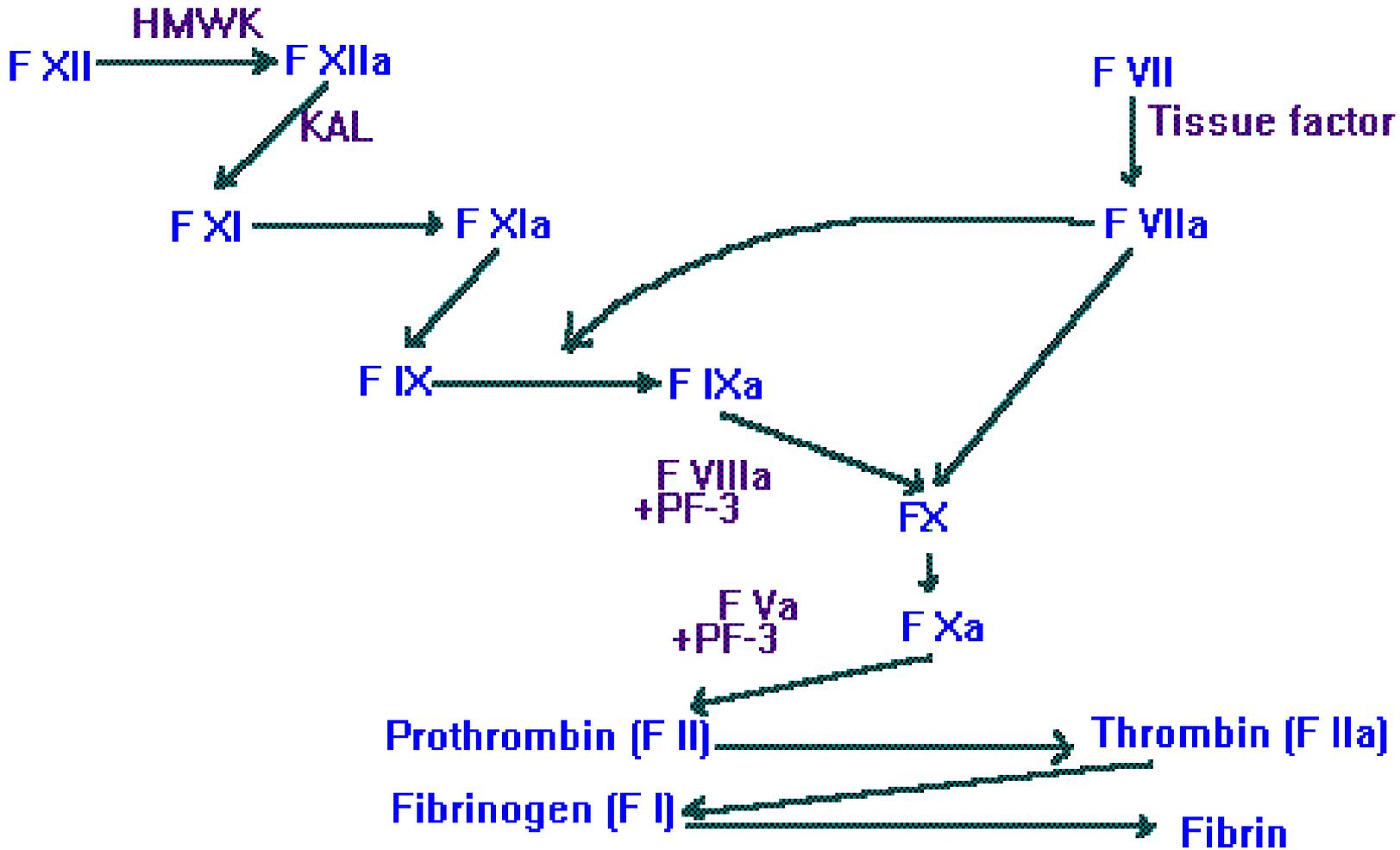
# SCREENING COAGULATION LABORATORY RESULTS

- PT= 29 sec (Normal 8-14.6)
- aPTT= 38 sec (Normal 24-36.5)
- Plt= 190,000 / $\mu$ L (Normal 150,000-350,000)

# Coagulation Cascade

**INTRINSIC**  
(surface contact)

**EXTRINSIC**  
(tissue damage)



# Differential Diagnosis

- Vitamin K deficiency-> mixing study, clinical correlation
- Liver disease-> mixing study, clinical correlation
- Lupus anticoagulant- > mixing study, dilute Russell Viper Venom Time (dRVVT)
- Anticoagulant (heparin + coumadin)-> mixing study, Thrombin Time
- DIC: not c/w normal platelet count

# Further test results

- Mixing PT= 12.1 sec (immediate), 13.6 sec (2 hr incubation) (Normal 8-14.6 sec)
- Mixing PTT= 31.2 sec (immediate), 35.0 sec (2 hr incubation) (Normal 24-36.5 sec)
- Optional tests: F VII=15%, F XI= 134%

# DIAGNOSIS

- Vitamin K Deficiency

# Vitamin K Deficiency

- Vitamin K dependent proteins:  
II, VII, IX, X and protein C and S
- The Vit K-dependent factors (II, VII, IX, X) have 9-12 glutamic acid residues near the amino terminal end, which need to be carboxylated (Vit K dependent) to bind calcium to phospholipid membranes.
- In Vit K deficiency, Vit K-dependent factors cannot bind to phospholipid membranes to maintain the coagulation cascade
- The same effect is seen in Coumadin treatment (Vit K antagonist)

## Vitamin K deficiency in adults and children

- Malabsorption of fat-soluble vitamins (bile duct atresia, celiac disease, short-bowel syndrome, etc.)
- Inadequate intake (prolonged fasting)
- Medications (coumadin, antibiotics esp. cephalosporins)

# Vitamin K deficiency in Infancy (hemorrhagic disease of the newborn)

- Premature
- Maternal anticonvulsant medications (phenytoin, phenobarbital, valproic acid, carbamazepine)
- Breast-feeding (human milk is lower in Vit-K compared to cow's)

# Sites of bleeding

- GI
- CNS
- Intrathoracic
- Intra-abdominal
- Others

# Typical test results

- Prolonged PT, PTT (PT  $\gg$  PTT)
- Mixing PT/PTT show correction
- Decreased Vit-K dependent factors (II, VII, IX, X)
- Negative DIC results (normal FSP/D-dimer, normal platelet count, no schistocytes in blood smear)

# Treatment

- For bleeding patients: FFP
- For all patients : Vit-K given subcutaneously
- Dosage:
  - Adults: 10 mg
  - Infants: 1-5 mg
  - Older children: 5-10 mg
- PT is typically corrected in 4-8 hrs

# Prophylactic treatment for infants

- For all infants: 1 mg Vit K<sub>1</sub> (IM) at birth (regardless of being premature or not)
- Breastfed infants: 1 mg Vit K<sub>1</sub> (oral) weekly
- Mothers on antibiotics/anticonvulsants: stop medications and take oral Vit-K (10 mg Vit K<sub>1</sub> daily) for 2 weeks before delivery