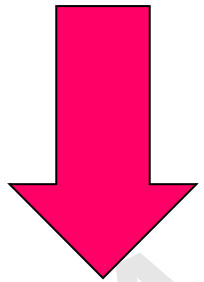
Balıkesir Üniversitesi
Tıp Fakültesi
Çocuk Sağlığı ve Hastalıkları Anabilim Dalı

ÇOCUKLUK DÖNEMİ KANAMA DİYATEZLERİ

Doç. Dr. Ali ATAŞ

Aktif kanama ile gelen veya

Kanamaya yatkınlığı olan çocukta



İyi bir öykü ve fizik muayene ile %90

ön tanı konur

İyi bir öykü ve fizik muayene ile %90 ön tanı konur

– Yaş
– Cinsiyet
– Klinik prezantasyon
– Hikayesi
– Aile öyküsü

ÇOCUKLUK ÇAĞINDA EN SIK PROBLEM

- **Epistaksis**
- **Kol ve bacaklarda morluklar**
- **Menoraji, menometroraji**

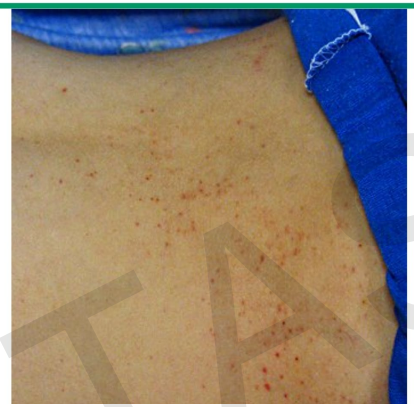
Kanama diyatezi mi?

Kanama hikayesi

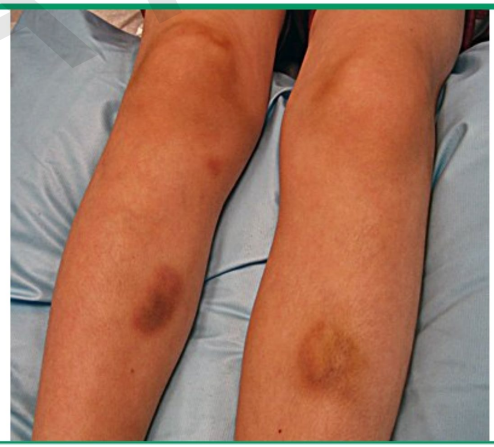
- Deri ve mukoz memranlardaki kanama trombositler, kan damarları ile ilgili patolojilerde ortaya çıkar.
  - Peteşi
  - Ekimoz

    ve/veya
  - Oral mukozal kanamalar
- Yumuşak doku ve eklemlerdeki kanamalar genellikle koagulasyon faktör eksiklikleri ile ilişkilidir.

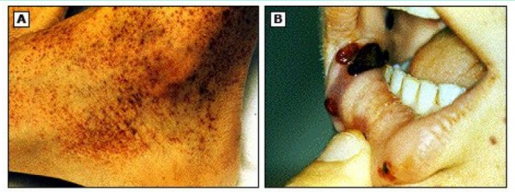
Petechiae



Ecchymoses



Petechiae in immune thrombocytopenia (ITP)

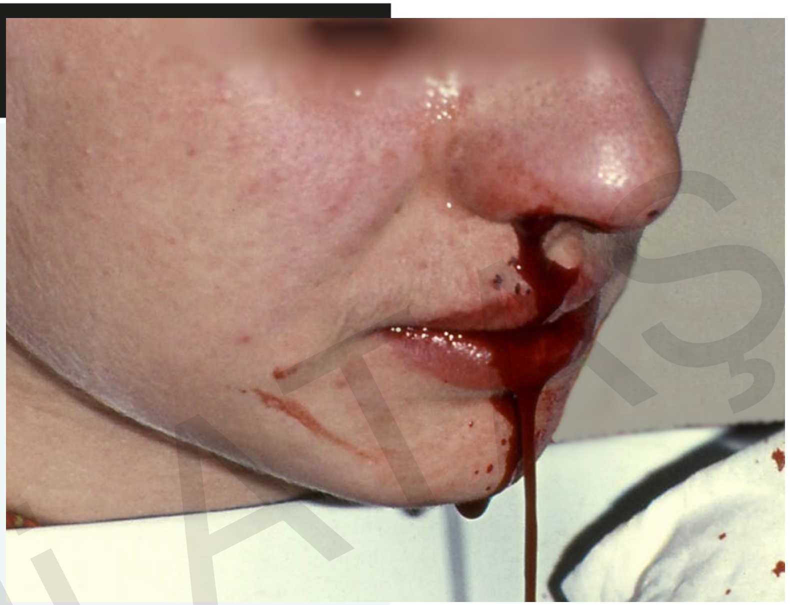


Petechiae in a man with immune thrombocytopenia (ITP).
(A) Dense, cutaneous petechiae on the foot and ankle. There are no petechiae on the sole of his foot, a site at which the vessels are protected by the strong subcutaneous tissue.
(B) Occasional petechiae on the patient's face and large, bullous hemorrhages on the buccal mucosa, which are related to the lack of vessel protection by the submucosal tissue. Similar petechiae and hemorrhagic bullae can be seen in patients with thrombocytopenia of any cause.

Table 377-1	Possible Causes of Epistaxis

Epistaxis digitorum (nose picking)
Rhinitis (allergic or viral)
Chronic sinusitis
Foreign bodies
Intranasal neoplasm or polyps
Irritants (e.g., cigarette smoke)
Septal deviation
Septal perforation
Trauma including child abuse
Vascular malformation or telangiectasia (hereditary hemorrhage telangiectasia)
Hemophilia
von Willebrand disease
Platelet dysfunction
Thrombocytopenia
Hypertension
Leukemia
Liver disease (e.g., cirrhosis)
Medications (e.g., aspirin, anticoagulants, nonsteroidal antiinflammatory drugs, topical corticosteroids)
Cocaine abuse

From Kucik CJ, Clenney T: Management of epistaxis, Am Fam Physician *71(2):305–311, 2005.*



Kanama hikayesi

- **Sağlıklı olan bir çocukta epistaksis gibi lokal bir kanama oluşmuş ise :**
  - Rinit
  - Travma
  - Yabancı cisim
  - Yüzeyel damarlarda hasarlanama
  - Kuru hava

Kanama hikayesi

- Girişim sonrası bir kanama oluşmuş ise (**tonsilektomi, circumcision, diş çekimi**) ve daha önceden de benzer durumlar oluşmuş ise altta yatan kanama bozukluklarını gösterebilir.

Kanama hikayesi

- Kanamanın
  - ciddiyeti,
  - sıklığı,
  - süresi,
  - lokalizasyonu
- Kanamayı izah eden durum varlığı veya yokluğu

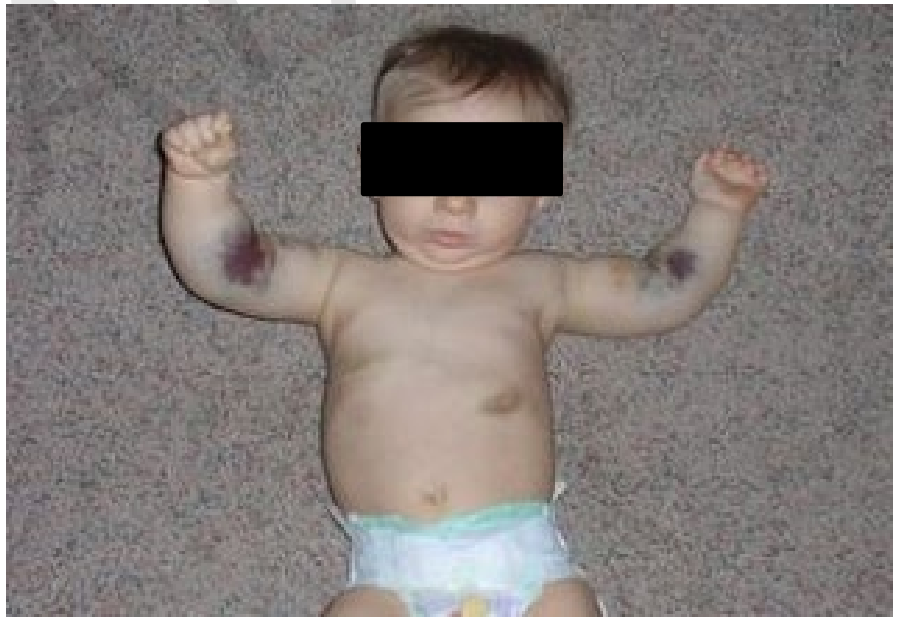
Kanama hikayesi

- **Zencefil** (ginger), gümüş düğme çiçeği (ferverfew), mabet ağacı(ginkgo biloba) ve fazla miktarda sarımsak kanamaları artırabilir.
- **Asetil salisilik asit** ve non-steroid antienflamatuarlar (ibuprofen, naproxen gibi) platelet fonksiyonunu bozarlar.
- **Warfarin** veya warfarin etkinliği olan fare zehiri ile intoksikasyon da kanama bozukluklarına neden olur.

Ginger

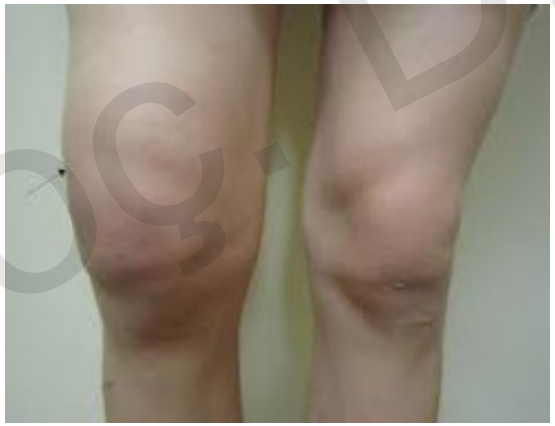
KLİNİK ÖZELLİKLER

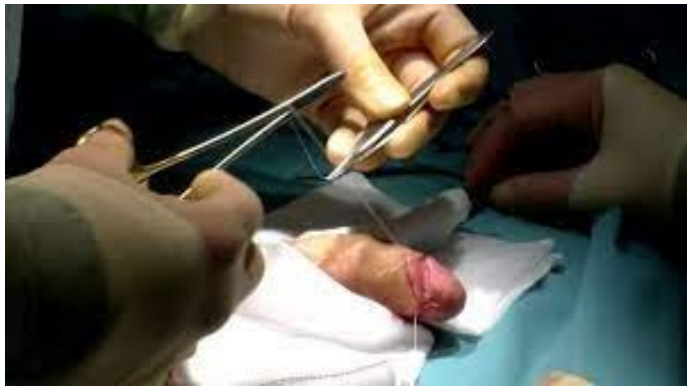
- Bebeklik ve çocukluk dönemindeki kanamalar özellikle aile öyküsü de varsa genetik geçişli kanama diyatezlerini düşündürür.
- Yenidoğan döneminde göbek düşmesi sonrası kanama olması **F-VIII** eksikliğini düşündürür. Ayrıca **vitamin K** eksikliğini düşünmek gerekir.



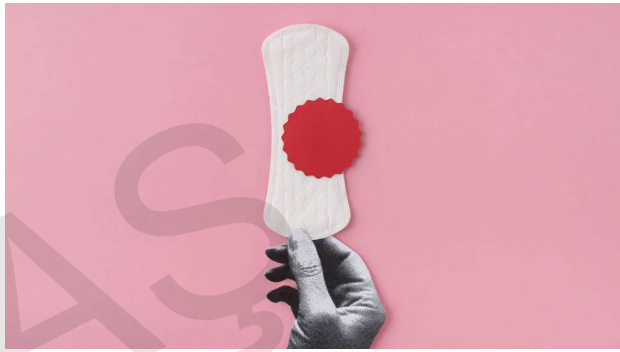
KLİNİK ÖZELLİKLER

- Yürümeye başlayan erkek bir çocukta eklemlerde olan veya circumcision sonrası kanama durumunda **hemofili** düşünülmelidir.





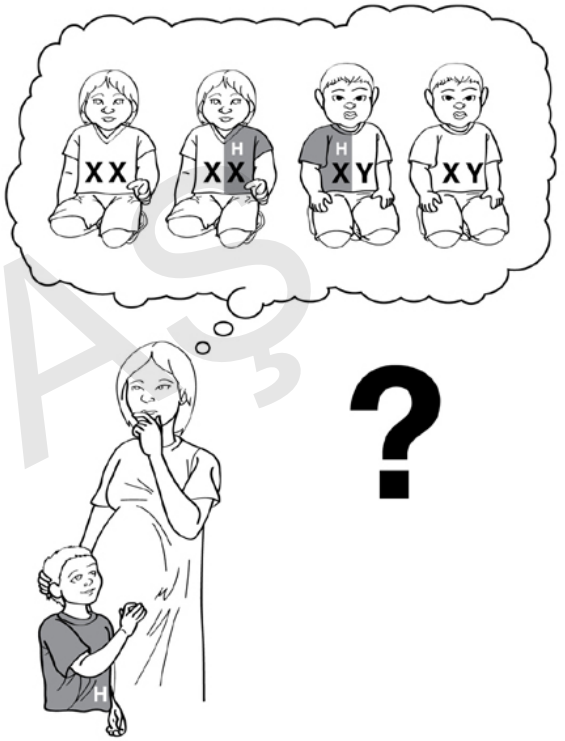
KLİNİK ÖZELLİKLER

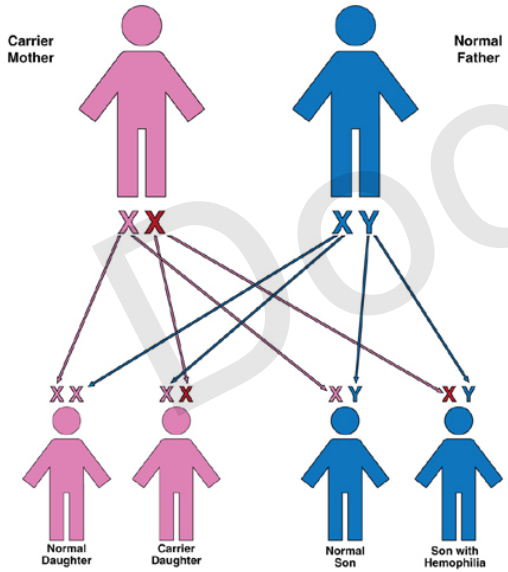


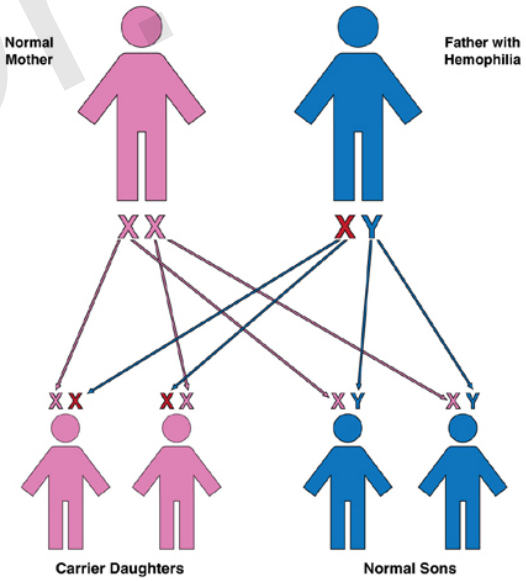
- Adolesan bir kızda adet kanamalarının abartılı olması, tekrarlayan burun kanamasının olması durumunda **von Willebrand (VWD)** hastalığı düşünülmelidir.

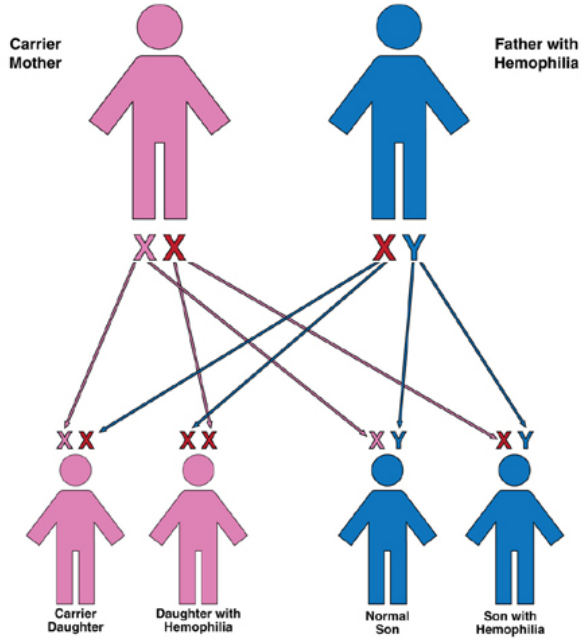
AİLE ÖYKÜSÜ

- Genetik kanama diyatezleri hakkında bilgi verir.









- Spontan
- Tekrarlayan
- Birden fazla bölgede
- Atipik lokalizasyonda
- Küçük bir travma veya girişim sonucunda beklenmedik şiddette
- Demir tedavisi veya transfüzyon gerektirmiş kanamalar

KANAMA DİYATEZİNİ DÜŞÜNDÜRMELİDİR

KANAMA DİYATEZİ DÜŞÜNÜLEN ÇOCUKDA:

Soru 1:

- **Konjenital mi?**
  - Erken başlar
  - Aile hikayesi (+)

- **Akkiz mi?**
  - Sistemik semptom ve bulgular (+)

KANAMA DİYATEZİ DÜŞÜNÜLEN ÇOCUKDA:

Soru 2

- **Defekt nerede?**
  - **Vasküler**
  - **Trombositer**
    - Trombositopeni
    - Trombosit fonksiyon bozukluğu
  - **Pıhtılaşma faktörlerinin azlığı**
  - **Artmış fibrinolizis**

Tek mi? /Birlikte mi?

Konjenital ise defekt tek

Akkiz ise birden fazla

Hemostaz nedir?

- Kanamanın durdurulması ve

- Dolaşımın bütünlüğünün korunması işlevine **hemostaz** denir.

Hemostasis

Vazokonstruksiyon (Vasküler Faz)

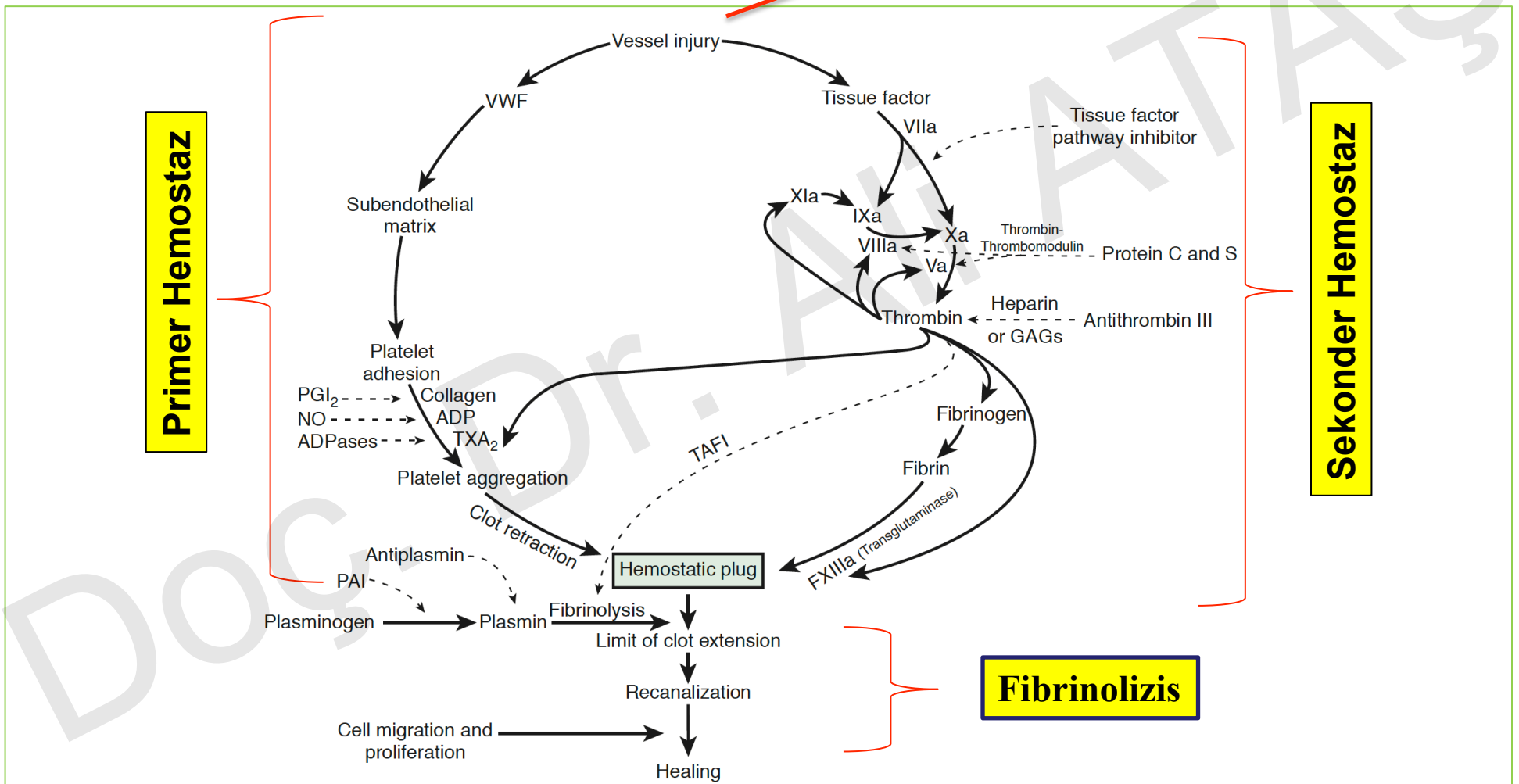
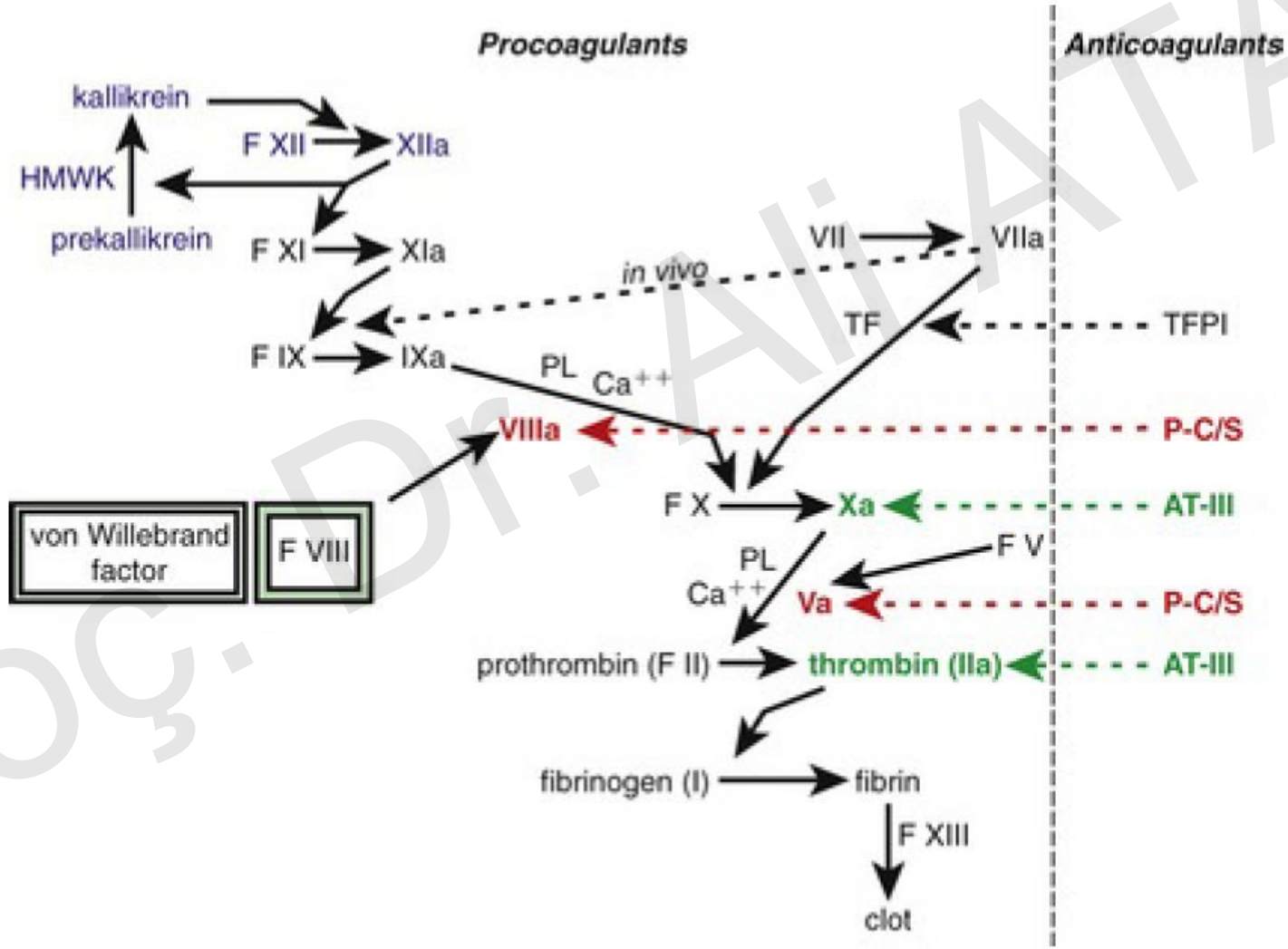


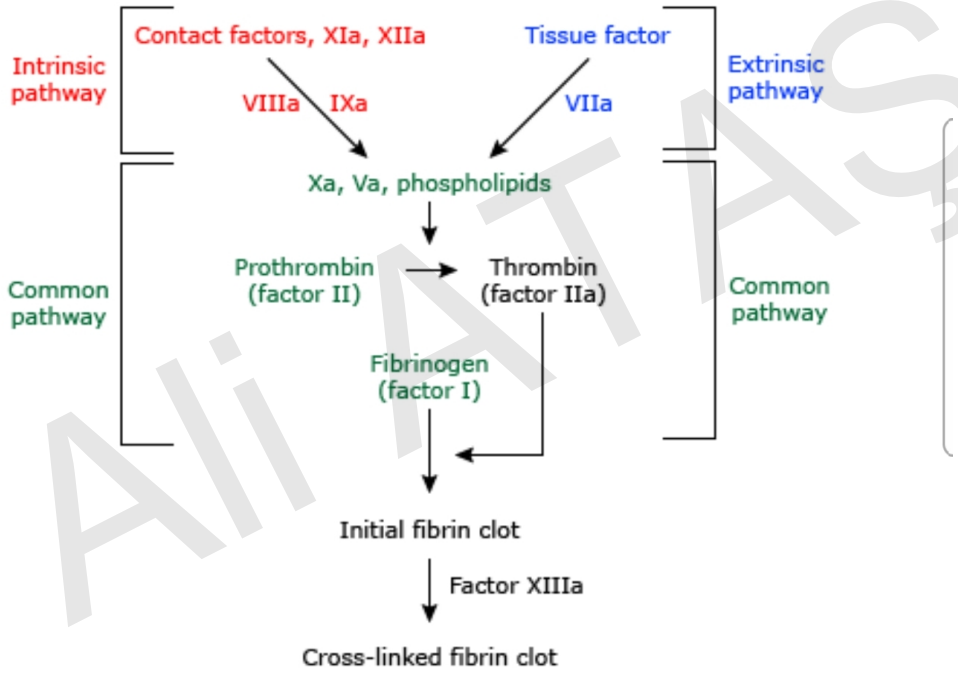
Figure 475-2 The hemostatic mechanism. ADP, adenosine diphosphate; GAGs, glycosaminoglycans; NO, nitric oxide; PGI_2, prostacyclin; PAI, plasminogen activator inhibitor; TAFI, thrombin-activated fibrinolytic inhibitor; TXA_2, thromboxane A_2; VWF, von Willebrand factor.

Hemostasis



Hemostasis

Intrinsic, extrinsic, and common coagulation pathways



Schematic representation of the intrinsic (red), extrinsic (blue), and common (green) coagulation pathways. Contact factors include prekallikrein and HMWK. In the clinical laboratory, the intrinsic (and common) pathway is assessed by the aPTT and the extrinsic (and common) pathway by the PT. The TT assesses the final step in the common pathway, the conversion of fibrinogen to fibrin, following the addition of exogenous thrombin. Fibrin is crosslinked through the action of factor XIII, making the final fibrin clot insoluble in 5 Molar urea or monochloroacetic acid. This latter function is not tested by the PT, aPTT, or TT.

HMWK: high molecular weight kininogen; aPTT: activated partial thromboplastin time; PT: prothrombin time; TT: thrombin time.

HEMOSTAZIN FAZLARI

1. Vasküler faz
2. Primer hemostaz (Trombosit plağı oluşması)
3. Sekonder hemostaz (Fibrin oluşması)
4. Fibrinolizis

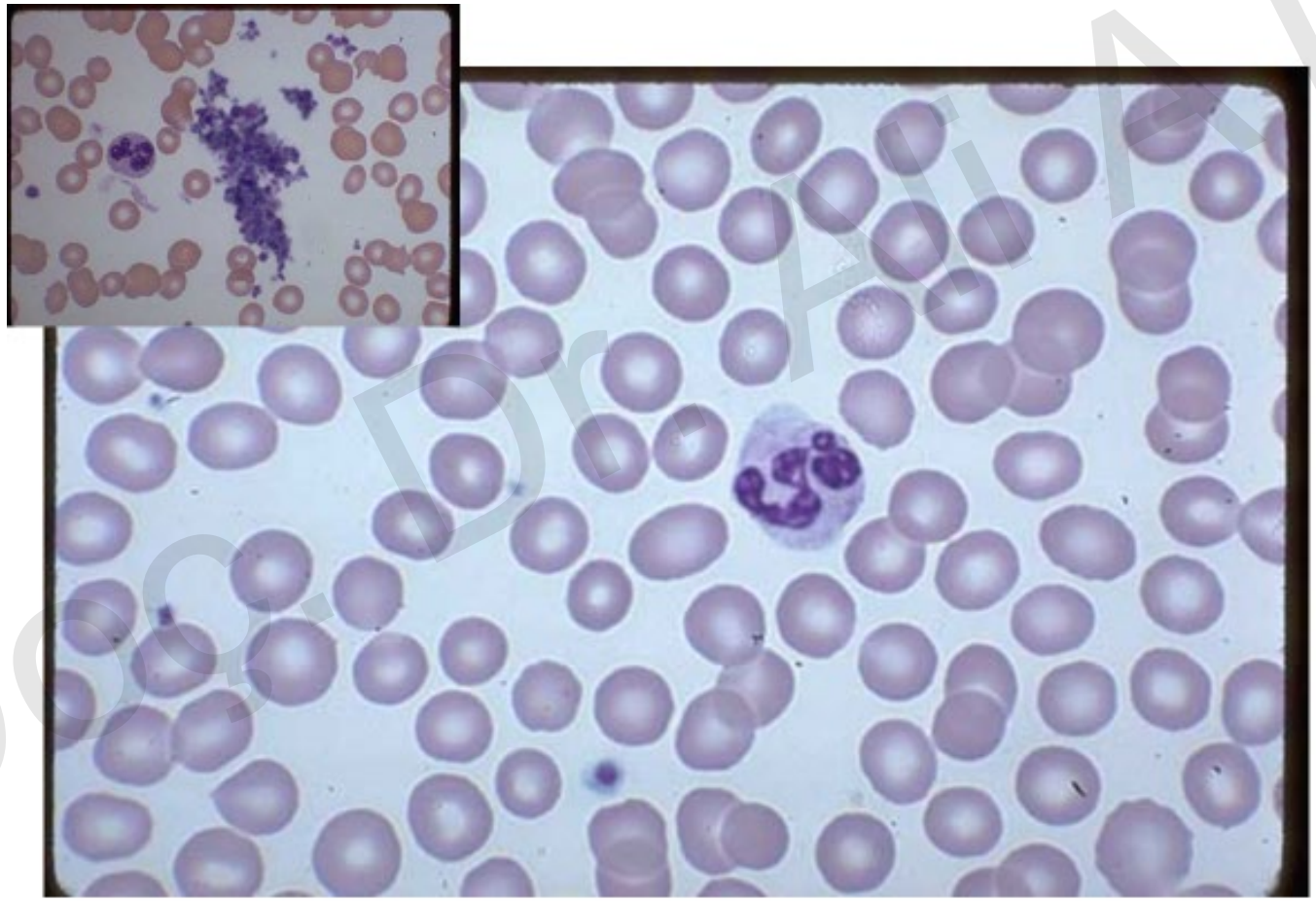
KANAMA DİYATEZİNE YOL AÇAN NEDENLER

I. Damarsal bozukluklar

- **Konjenital nedenler**:
  - Kalıtsal hemorajik telanjiektazi,
  - Kalıtsal bağ dokusu hastalıkları
    - Ehler danlos sendromu, Osteogenesis imperfecta
- **Akkiz nedenler:**
  - Skorbüt,
  - Vaskülitler (Henoch Schonlein Vaskuliti).

KANAMA DİYATEZİNE YOL AÇAN NEDENLER

II. Trombositopeniler



KANAMA DİYATEZİNE YOL AÇAN NEDENLER

II. Trombositopeniler

1. Azalmış yapıma bağlı nedenler

a. Konjenital nedenler:

- Fanconi aplastik anemisi,
- Amegakaryositik trombositopeni,
- TAR sendromu,

b. Akkiz nedenler:

- Aplastik anemi,
- Lösemi
- İlaçlar, Toksik maddeler,
- Enfeksiyonlar,
- Radyasyon,

2. Artmış yıkıma bağlı nedenler

- **İmmun nedenler:**
  Enfeksiyon, İTP, SLE, ilaçlar
- **Nonimmun nedenler:**
  DİK, HUS, Yapay kalp kapakları, Enfeksiyonlar

3. Anormal trombosit dağılımı veya sekestrasyonu

- Hipersplenizm
- Hipotermi, Massif kan transfüzyonu

KANAMA DİYATEZİNE YOL AÇAN NEDENLER

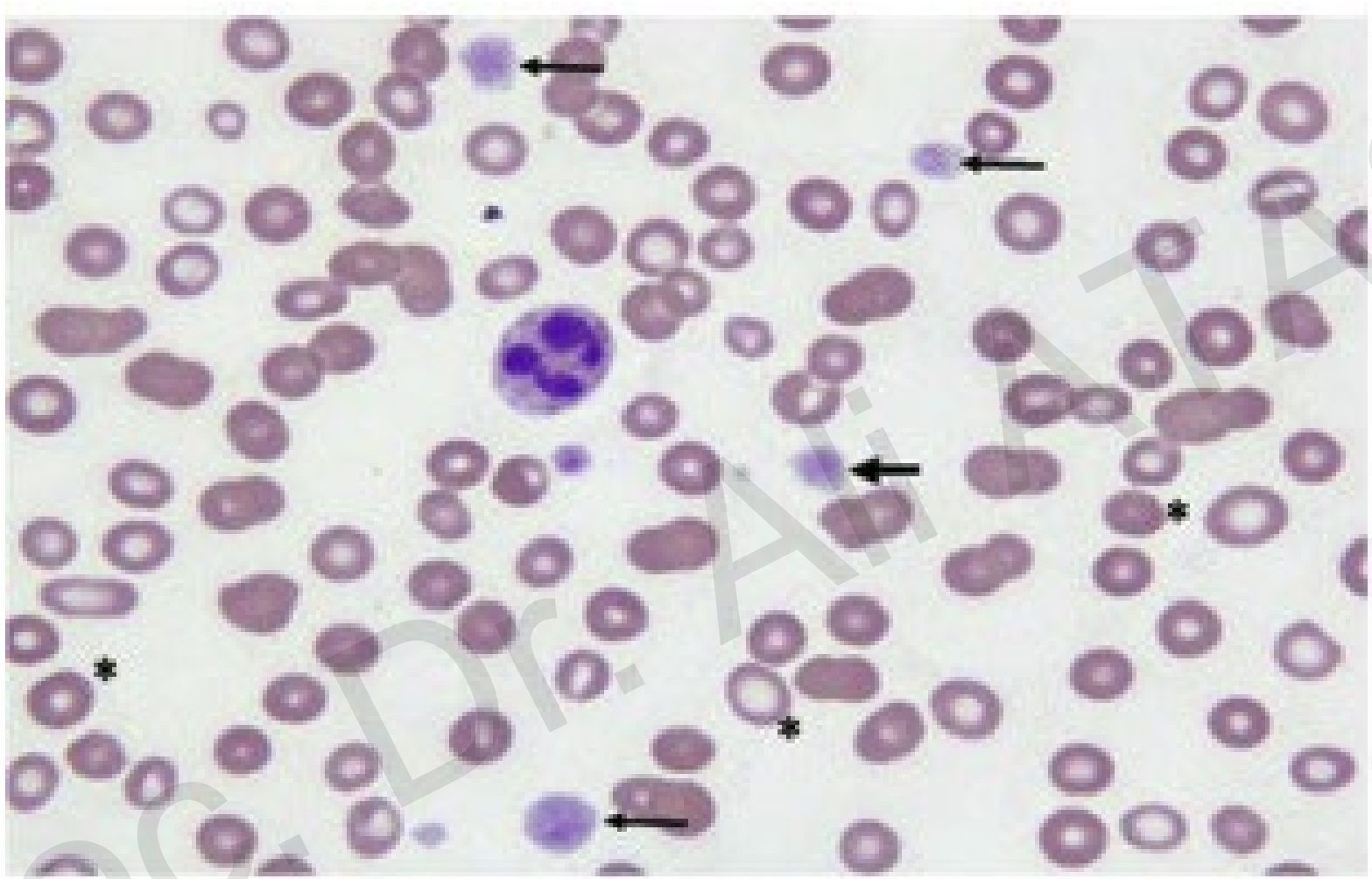
III. Trombosit fonksiyon bozuklukları

– **Konjenital nedenler**:

- Bernard-Soulier Sendromu,
- Glanzmann hastalığı,
- Gri trombosit sendromu,

– **Akkiz nedenler**:

- İlaçlar (Asetil salisilik asit, NSAI),
- Karaciğer hastalığı,
- Üremi



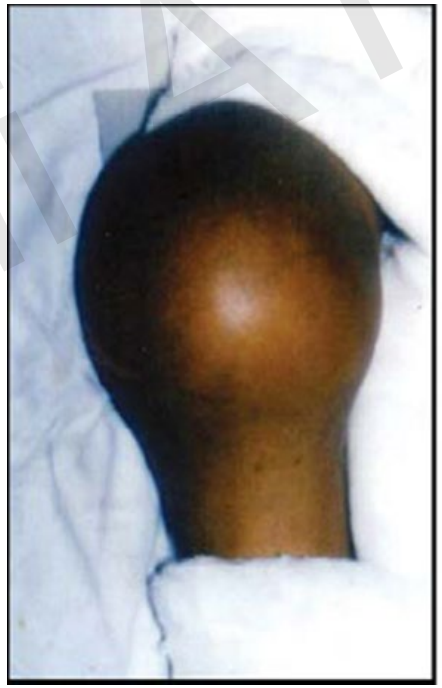
Bernard-Soulier Sendromu (**Oklar dev trombositleri göstermektedir**.)

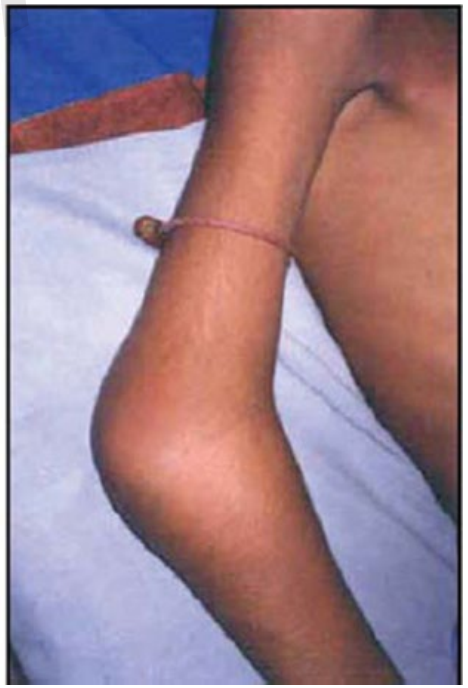
KANAMA DİYATEZİNE YOL AÇAN NEDENLER

IV. Pıhtılaşma bozuklukları

– Konjenital nedenler:

- **<u>En sık von Willebrand Hastalığı</u>**
- Hemofili A (VIII) ve B(IX)





– Akkiz nedenler:

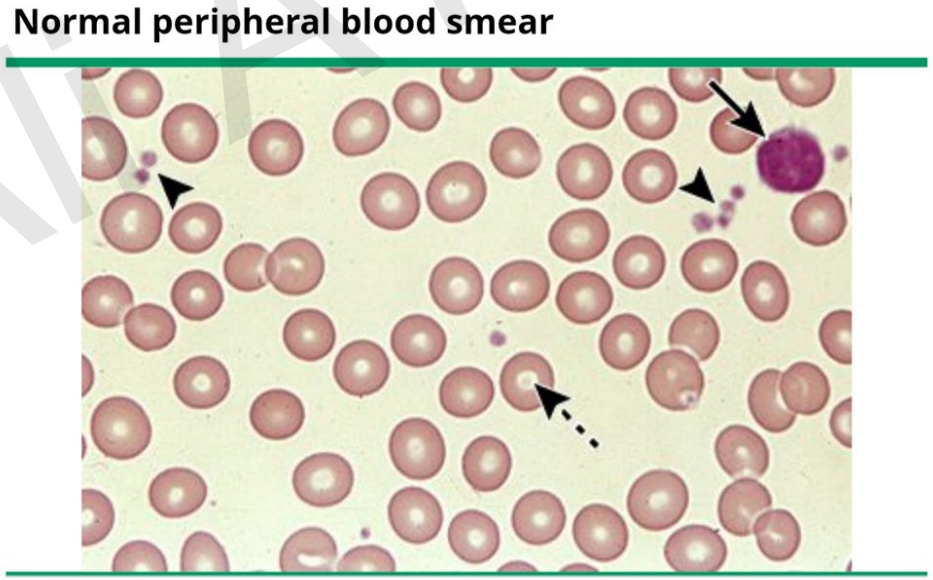
- KC, kalp, böbrek hastalığı,
- Vit K eksikliği

V. Artmış fibrinolizis

Kanama diyatezi düşünülen bir hastaya tanıda yapılması gereken ilk basamak tarama testleri

- **Tam kan sayımı:**
  - Özellikle trombosit sayısı

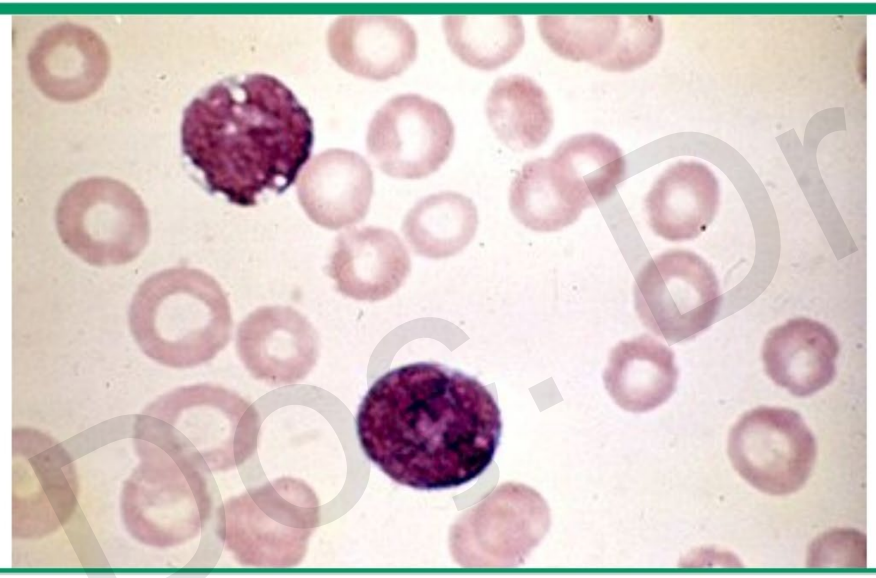
- **Periferik yayma**
  - Antikoagulansız alınan kandan yapılan periferik kan yaymasından trombositlerin değerlendirilmesi



High-power view of a normal peripheral blood smear. Several platelets (arrowheads) and a normal lymphocyte (arrow) can also be seen. The red cells are of relatively uniform size and shape. The diameter of the normal red cell should approximate that of the nucleus of the small lymphocyte; central pallor (dashed arrow) should equal one-third of its diameter.

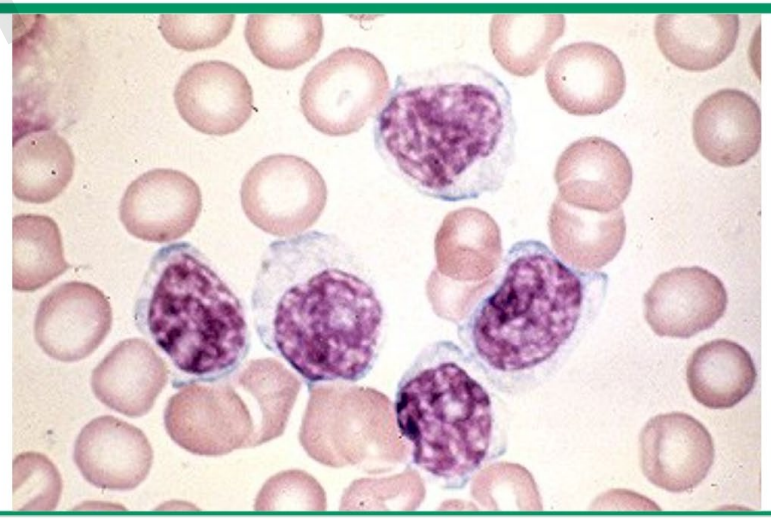
Kanama diyatezi düşünülen bir hastaya tanıda yapılması gereken ilk basamak tarama testleri:Periferik yayma

Lymphoblasts in acute lymphoblastic leukemia



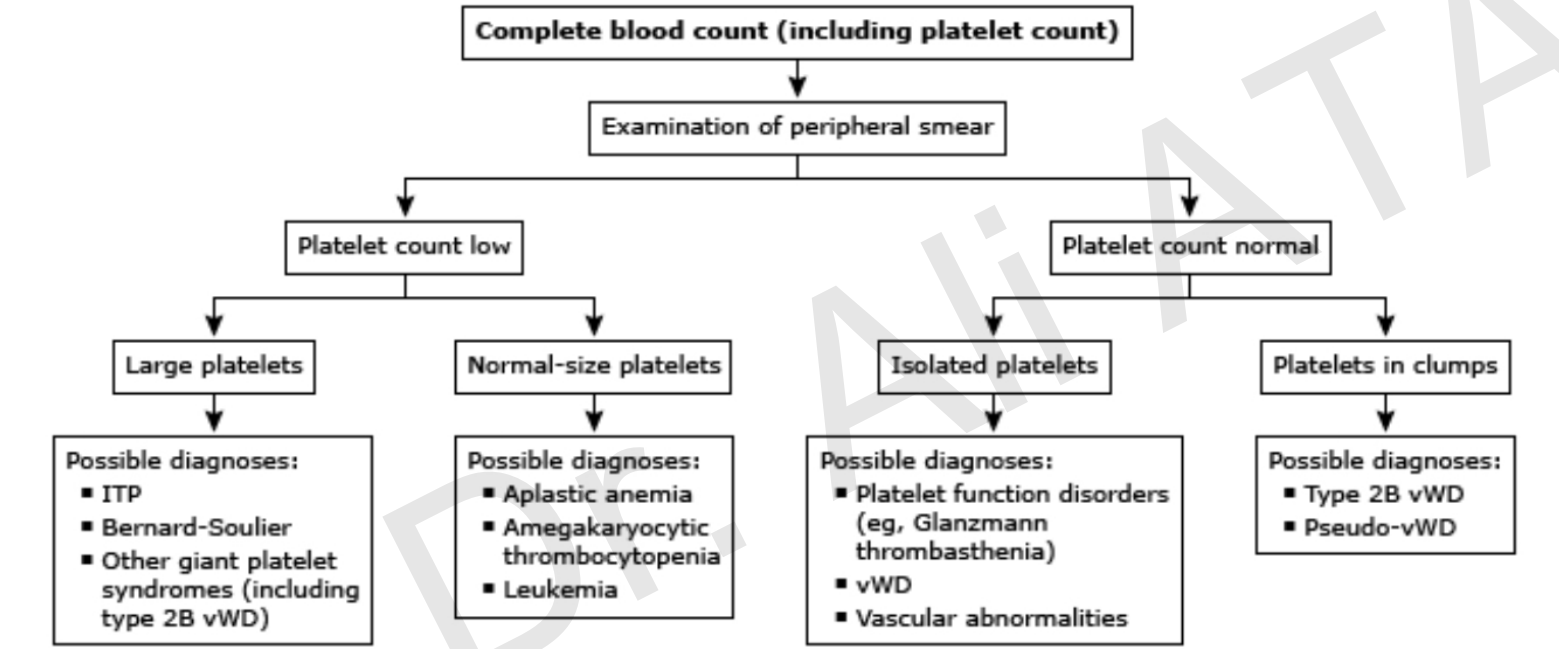
Blood smear showing small lymphoblasts with rare nucleoli and vacuoles, as seen in acute lymphocytic leukemia.

Lymphoblasts in acute lymphoblastic leukemia



Blood smear showing large lymphoblasts with prominent nucleoli and light blue cytoplasm, as seen in acute lymphoblastic leukemia of the World Health Organization classification. (Wright-Giemsa stain)

Diagnostic approach to a child with mucocutaneous bleeding (purpuric disorders) based on platelet count and platelet appearance on peripheral smear*



ITP: immune thrombocytopenia (previously known as idiopathic thrombocytopenic purpura); vWD: von Willebrand disease.

* Mucocutaneous bleeding in children is characteristic of disorders that cause abnormal platelet number and/or function. However, mucocutaneous bleeding can also occur in patients with abnormal coagulation (eg, hemophilia, disseminated intravascular coagulation). The diagnostic approach presented here represents a simplified approach based solely on platelet count and the appearance of the platelets on peripheral smear. In many cases, additional evaluation is warranted. Refer to UpToDate topic on the evaluation of bleeding symptoms in children for additional details.

Kanama diyatezi düşünülen bir hastaya tanıda yapılması gereken ilk basamak tarama testleri

- **Kanama zamanı**
- **Protrombin zamanı (PT) /INR**
- **Aktive parsiyel tromboplastin zamanı (aPTT)**
- **Trombin zamanı (TT)**
- **Fibrinojen düzeyi tayini**
- **Faktör düzey tayinleri**

….

VIII eksikliği hemofili A
IX eksikliği hemofili B

Kanama diyatezi düşünülen bir hastaya tanıda yapılması gereken ilk basamak tarama testleri

Kanama zamanı

- Normal değer **2-4** dakikadır.
- Kanama zamanının normalden uzun olması, daha çok **trombositler** ya da **damar çeperi** ile ilgili bir patolojik olayın varlığını düşündürmelidir.

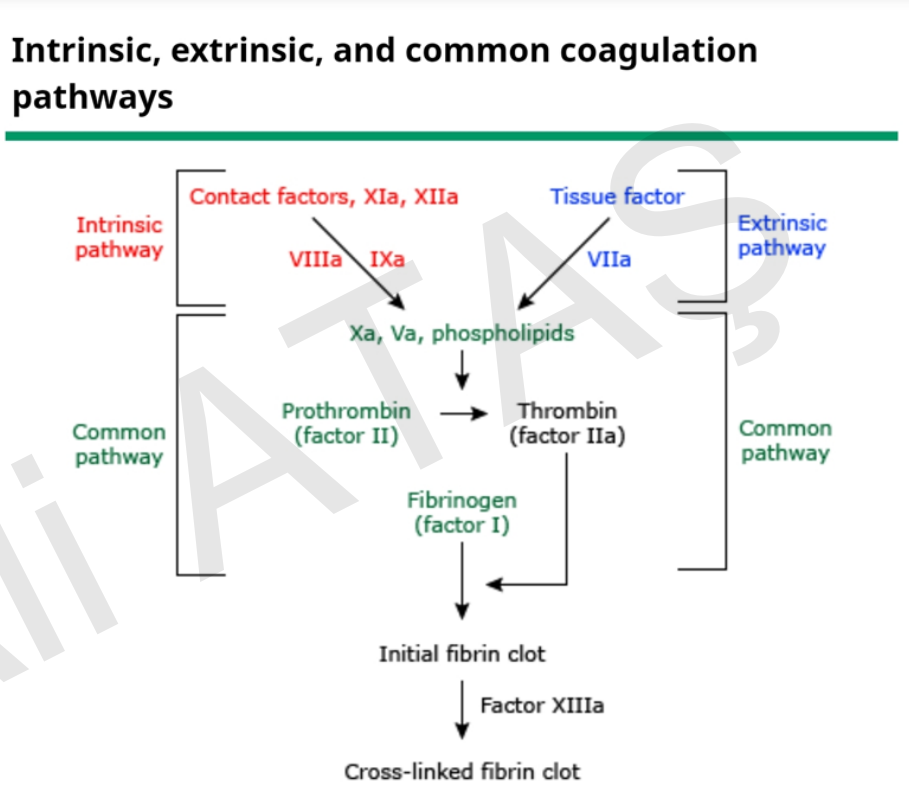
VIII eksikliği hemofili A
IX eksikliği hemofili B

- **Protrombin zamanı (PT) / INR** **(INR = Patient PT ÷ Control PT)**

  - **Ekstrinsik yolu** ve ortak yolu gösterir.

    - Ortak yolu (X, V, II, I) göstermede aPTT'den **daha duyarlıdır.**

  - VII eksikliğinde uzar.



Schematic representation of the intrinsic (red), extrinsic (blue), and common (green) coagulation pathways. Contact factors include prekallikrein and HMWK. In the clinical laboratory, the intrinsic (and common) pathway is assessed by the aPTT and the extrinsic (and common) pathway by the PT. The TT assesses the final step in the common pathway, the conversion of fibrinogen to fibrin, following the addition of exogenous thrombin. Fibrin is crosslinked through the action of factor XIII, making the final fibrin clot insoluble in 5 Molar urea or monochloroacetic acid. This latter function is not tested by the PT, aPTT, or TT.

HMWK: high molecular weight kininogen; aPTT: activated partial thromboplastin time; PT: prothrombin time; TT: thrombin time.

Aktive parsiyel tromboplastin zamanı (aPTT)

- **İntrinsik yol** eksikliklerine duyarlı:

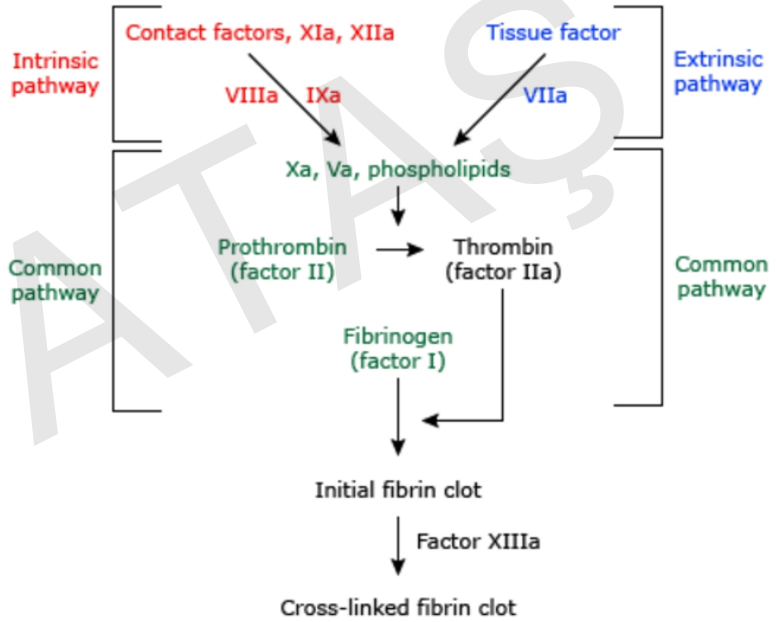
  VIII, IX

Ortak yolu göstermede PT'den daha az duyarlı:

- X, V, II(Protrombin), I (fibrinoljen)

VIII eksikliği hemofili A
IX eksikliği hemofili B

Intrinsic, extrinsic, and common coagulation pathways



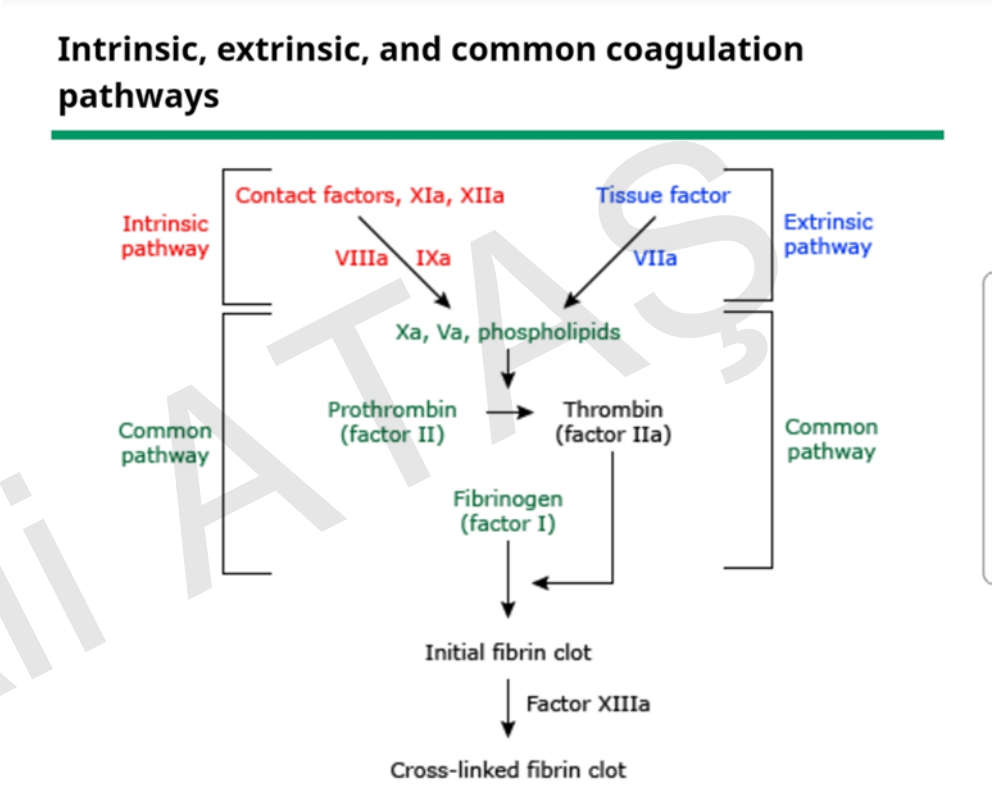
Schematic representation of the intrinsic (red), extrinsic (blue), and common (green) coagulation pathways. Contact factors include prekallikrein and HMWK. In the clinical laboratory, the intrinsic (and common) pathway is assessed by the aPTT and the extrinsic (and common) pathway by the PT. The TT assesses the final step in the common pathway, the conversion of fibrinogen to fibrin, following the addition of exogenous thrombin. Fibrin is crosslinked through the action of factor XIII, making the final fibrin clot insoluble in 5 Molar urea or monochloroacetic acid. This latter function is not tested by the PT, aPTT, or TT.

HMWK: high molecular weight kininogen; aPTT: activated partial thromboplastin time; PT: prothrombin time; TT: thrombin time.

Kanama diyatezi düşünülen bir hastaya tanıda yapılması gereken ilk basamak tarama testleri

- **Trombin zamanı (TT)**
  - Hipofibrinojenemide ve heparin varlığında uzar.

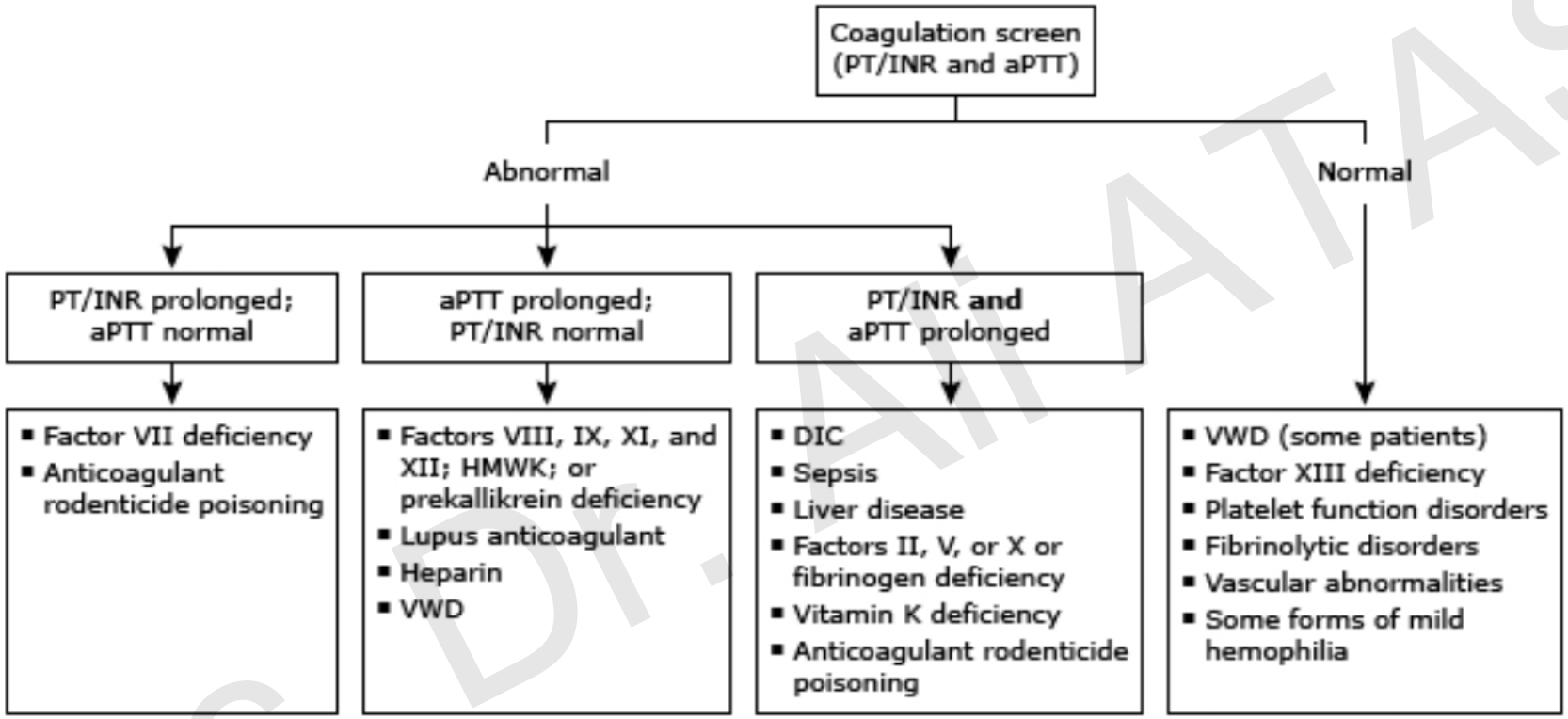
- **Fibrinojen düzeyi tayini :**
  - Eksikliğinde hem PT hem d aPTT uzar.



Schematic representation of the intrinsic (red), extrinsic (blue), and common (green) coagulation pathways. Contact factors include prekallikrein and HMWK. In the clinical laboratory, the intrinsic (and common) pathway is assessed by the aPTT and the extrinsic (and common) pathway by the PT. The TT assesses the final step in the common pathway, the conversion of fibrinogen to fibrin, following the addition of exogenous thrombin. Fibrin is crosslinked through the action of factor XIII, making the final fibrin clot insoluble in 5 Molar urea or monochloroacetic acid. This latter function is not tested by the PT, aPTT, or TT.

HMWK: high molecular weight kininogen; aPTT: activated partial thromboplastin time; PT: prothrombin time; TT: thrombin time.

Algorithm for identifying causes of bleeding symptoms in children based on results of coagulation screen



Refer to UpToDate topic on the evaluation of bleeding symptoms in children for additional details.

PT: prothrombin time; INR: international normalized ratio; aPTT: activated partial thromboplastin time; VWD: von Willebrand disease; HMWK: high molecular weight kininogen; DIC: disseminated intravascular coagulation.

Graphic 60745 Version 12.0

İlk basamak tarama testleri sonucuna göre gerekebilen ileri tanısal testler

- Fibrinolizisin arttığı düşünülüyorsa **fibrin yıkım ürünleri** (FDP), **D-dimer**
- Trombosit fonksiyon bozukluğu düşünülüyorsa trombosit fonksiyon testleri
- Von Willebrand hastalığı düşünülüyorsa:
  - vWFAg düzeyi
  - Ristocetin kofaktör aktivitesi
  - VWF: Kollagen bağlanma aktivitesi
  - FVIII düzeyi
  - Kan grubu
  - SDS jel elektroforezinde vWF multimer analizi
- Faktör düzeyleri
- Diğer testler (karaciğer fonksiyon testleri, kemik iliği aspirasyonu, inhibitör tayini, vb).

Normal range for coagulation tests by age

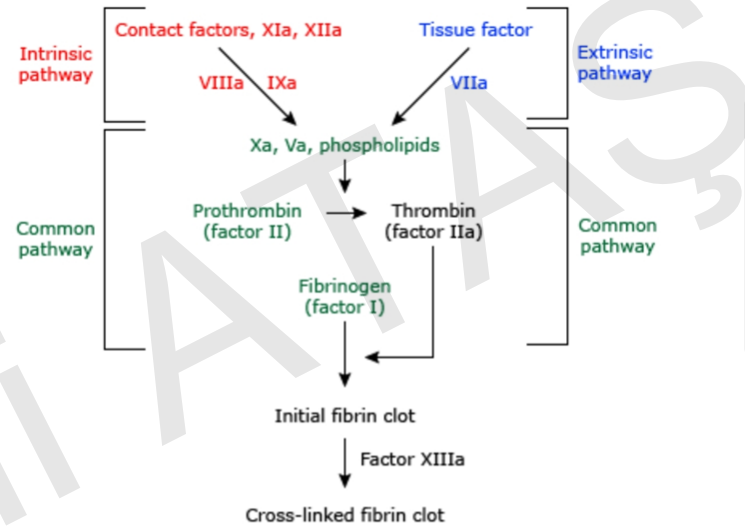
Coagulation tests	Age						
	Day 1 of life Mean (boundary)	Day 3 of life Mean (boundary)	1 to 12 months Mean (boundary)	1 to 5 years Mean (boundary)	6 to 10 years Mean (boundary)	11 to 16 years Mean (boundary)	Adult Mean (boundary)
PT(s)*	15.6 (14.4-16.4)¶	14.9 (13.5-16.4)¶	13.1 (11.5-15.3)	13.3 (12.1-14.5)¶	13.4 (11.7-15.1)¶	13.8 (12.7-16.1)¶	13 (11.5-14.5)
INR	1.26 (1.15-1.35)¶	1.2 (1.05-1.35)¶	1 (0.86-1.22)	1.03 (0.92-1.14)¶	1.04 (0.87-1.2)¶	1.08 (0.97-1.3)¶	1 (0.8-1.2)
aPTT(s)*	38.7 (34.3-44.8)¶	36.3 (29.5-42.2)¶	39.3 (35.1-46.3)¶	37.7 (33.6-46.3)¶	37.3 (31.8-43.7)¶	39.5 (33.9-46.1)¶	33.2 (28.6-38.2)
Fibrinogen (g/L)	2.8 (1.92-3.74)	3.3 (2.83-4.01)	2.42 (0.82-3.83)¶	2.82 (1.62-4.01)¶	3.04 (1.99-4.09)	3.15 (2.12-4.33)	3.1 (1.9-4.3)
Factor II (U/mL)	0.54 (0.41-0.69)¶	0.62 (0.5-0.73)¶	0.9 (0.62-1.03)¶	0.89 (0.7-1.09)¶	0.89 (0.67-1.1)¶	0.9 (0.61-1.07)¶	1.1 (0.78-1.38)
Factor V (U/mL)	0.81 (0.64-1.03)¶	1.22 (0.92-1.54)	1.13 (0.94-1.41)	0.97 (0.67-1.27)¶	0.99 (0.56-1.41)¶	0.89 (0.67-1.41)¶	1.18 (0.78-1.52)
Factor VII (U/mL)	0.7 (0.52-0.88)¶	0.86 (0.67-1.07)¶	1.28 (0.83-1.6)	1.11 (0.72-1.5)¶	1.13 (0.7-1.56)¶	1.18 (0.69-2)	1.29 (0.61-1.99)
Factor VIII (U/mL)	1.82 (1.05-3.29)	1.59 (0.83-2.74)	0.94 (0.54-1.45)¶	1.1 (0.36-1.85)¶	1.17 (0.52-1.82)¶	1.2 (0.59-2)¶	1.6 (0.52-2.9)
vWF (U/mL)	n/a	n/a	n/a	0.82 (0.6-1.2)	0.95 (0.44-1.44)	1 (0.46-1.53)	0.92 (0.5-1.58)
Factor IX (U/mL)	0.48 (0.35-0.56)¶	0.72 (0.44-0.97)¶	0.71 (0.43-1.21)¶	0.85 (0.44-1.27)¶	0.96 (0.48-1.45)¶	1.11 (0.64-2.16)¶	1.3 (0.59-2.54)
Factor X (U/mL)	0.55 (0.46-0.67)¶	0.6 (0.46-0.75)¶	0.95 (0.77-1.22)¶	0.98 (0.72-1.25)¶	0.97 (0.68-1.25)¶	0.91 (0.53-1.22)¶	1.24 (0.96-1.71)
Factor XI (U/mL)	0.3 (0.7-0.41)¶	0.57 (0.24-0.79)¶	0.89 (0.62-1.25)¶	1.13 (0.65-1.62)	1.13 (0.65-1.62)	1.11 (0.65-1.39)	1.12 (0.67-1.96)
Factor XII (U/mL)	0.58 (0.43-0.8)¶	0.53 (0.14-0.8)¶	0.79 (0.2-1.35)¶	0.85 (0.36-1.35)¶	0.81 (0.26-1.37)¶	0.75 (0.14-1.17)¶	1.15 (0.35-2.07)
XIIIa (U/mL)	n/a	n/a	n/a	1.08 (0.72-1.43)¶	1.09 (0.65-1.51)¶	0.99 (0.57-1.4)	1.05 (0.55-1.55)
XIIIs (U/mL)	n/a	n/a	n/a	1.13 (0.69-1.56)¶	1.16 (0.77-1.54)¶	1.02 (0.6-1.43)	0.97 (0.57-1.37)

All factors except fibrinogen are expressed as units per milliliter, where pooled plasma contains 1.0 U/mL. All data are expressed as the mean, followed by the upper and lower boundary encompassing 95% of the population. Between 20 and 67 samples were assayed for each value for each age group. Some measurements were skewed due to a disproportionate number of high values. The lower limit, which excludes the lower 2.5% of the population, is given.

PT: prothrombin time; INR: international normalized ratio; aPTT: activated partial thromboplastin time; VIII: factor VIII procoagulant; vWF: von Willebrand factor; n/a: data not available.
* Normal range for PT and aPTT should be based upon the standards set by individual clinical laboratories.
¶ Denotes values that are significantly different from adults.

Data on vWF, XIIIa and XIIIs from: Andrew M, Vegh P, Johnston M, et al. Maturation of the Hemostatic System During Childhood. Blood 1992; 80:1999.
Remaining data from: Monagle P, Barnes C, Ignjatovic V, et al. Developmental Haemostasis. Thrombosis and Haemostasis 2006; 95:362.

Intrinsic, extrinsic, and common coagulation pathways



Schematic representation of the intrinsic (red), extrinsic (blue), and common (green) coagulation pathways. Contact factors include prekallikrein and HMWK. In the clinical laboratory, the intrinsic (and common) pathway is assessed by the aPTT and the extrinsic (and common) pathway by the PT. The TT assesses the final step in the common pathway, the conversion of fibrinogen to fibrin, following the addition of exogenous thrombin. Fibrin is crosslinked through the action of factor XIII, making the final fibrin clot insoluble in 5 Molar urea or monochloroacetic acid. This latter function is not tested by the PT, aPTT, or TT.

HMWK: high molecular weight kininogen; aPTT: activated partial thromboplastin time; PT: prothrombin time; TT: thrombin time.

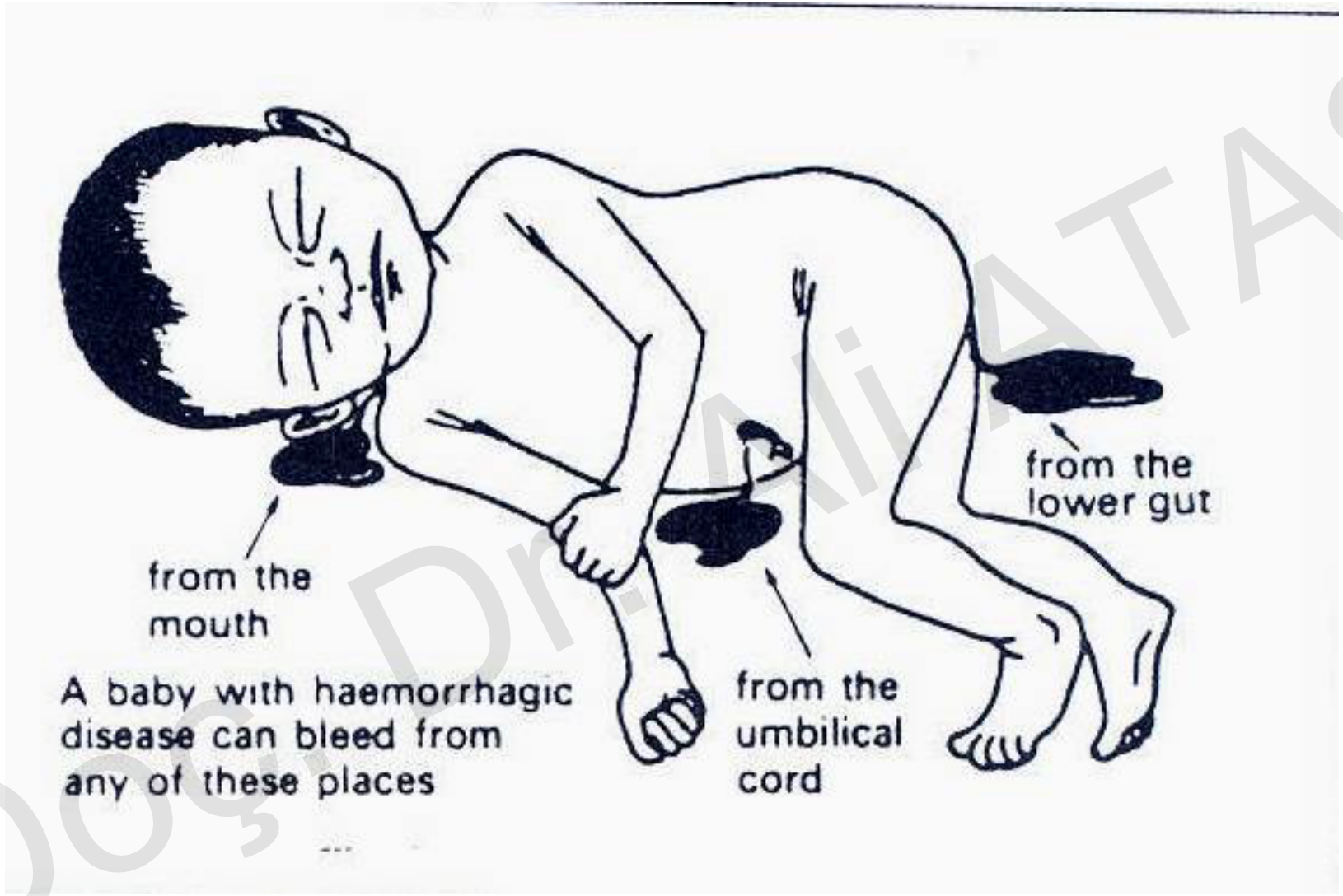
Sağlıklı prematüre ve term infantlarda PT ve aPTT'nin normal değerleri

	PT (saniye)	aPTT(saniye)
Prematüre infant		
24-29 hafta, 1. gün	12-21,5	40-100
30-36 hafta, 1. gün	11-16	29-79
Term infant		
1-4 gün	12-18	29-57
5-21 gün	12-18	29-52
4-12 hafta	12-16,5	29-52
13-25 hafta	**12-16**	29-47
26-51 hafta	**12-16**	29-40
1 yaş- erişkin	**12-16**	**27-37**

EKLER

PT ve aPTT
Yenidoğanda
En Sık
Hangi Nedenle Uzun Çıkar ?

?



A baby with haemorrhagic disease can bleed from any of these places

Vitamin K eksikliği

von WILLEBRAND HASTALIĞI

Konjenital kanama diyatezlerinin en sık görülenidir.

PREVELANSI:

- **1/100-1/10.000 arasında tanı koyma kriterlerine göre değişir.**

von WILLEBRAND HASTALIĞI

- **Von Willebrand faktördeki (VWF) defekt sonucu oluşur.** *(VWF'ün koagulasyondan birçok rolü vardır.)*
- **Tipik olarak mukozal kanamamalar oluşur.**
- **Tanı için:**
  - ✓ Aile öyküsü
  - ✓ Kanama semptomları
  - ✓ Laboratuvar testler ile tanı konur.

(maalesef tek bir test ile tanı koymak mümkün değildir.)

von Willebrand Hastalığında Laboratuvar

	Normal	Type 1	Type 1C (Vicenza)	Type 3	Type 2A	Type 2B	Type 2N	Type 2M	PT-VWD
VWF:Ag	N	↓	↓↓	absent	↓	↓	N or ↓	↓ or N	↓
VWF:RCo	N	↓	↓↓	absent	↓↓↓	↓↓	N or ↓	↓↓	↓↓
FVIII:C	N	N or ↓	↓	2-10 IU/dL	N or ↓	N or ↓	↓↓	N	N or ↓
VWFpp/VWF:Ag ratio	N	N	↑↑	absent	N or ↑	↑	N	N	↑
RIPA	N	often N	↓	absent	↓	often N	N	N or ↓	often N
LD-RIPA	absent	absent	absent	absent	absent	↑↑↑	absent	absent	↑↑↑
PFA'	N	N or ↑	↑	↑↑↑	↑	↑	N	↑	↑
BT'	N	N or ↑	↑	↑↑↑	↑	↑	N	↑	↑
Platelet count	N	N	N	N	N	↓ or N	N	N	↓
VWF multimers	N	N but ↓	N but ↓	absent	abnormal	abnormal	N but ↓	N but ↓	abnormal

Figure 477-1 Specialized laboratory testing for VWD. ↓,↓↓,↓↓↓, Relative decrease; ↑,↑↑,↑↑↑, relative increase; BT, bleeding time; FVIII:C, factor VIII coagulant activity; LD-RIPA, low-dose ristocetin-induced platelet aggregation; N, normal; N but ↓, normal but decreased in intensity; PT-VWD, platelet-type VWD; RIPA, ristocetin-induced platelet aggregation; VWF:Ag, VWF antigen; VWF:RCo, VWF activity by ristocetin cofactor; VWFpp, VWF propeptide. *(Courtesy of Dr. Robert R. Montgomery.)*

von Willebrand Hastalığı Tipleri&Tedavisi

Table 477-3 VWD Treatment

TREATMENT	VWD TYPES	ADMINISTRATION	DOSING
Desmopressin*	Type 1 VWD Some type 2 VWD (use with caution)	IV or IN	0.3 µg/kg IV† 1 spray IN (<50 kg) 2 sprays IN (>50 kg)
von Willebrand factor concentrates‡	Type 3 VWD Type 2 VWD Severe type 1 VWD (or type 1 clearance defects)	IV	40-60 ristocetin cofactor activity units/kg (adjust dose depending on baseline VWF level and desired peak VWF level)
Antifibrinolytics	Mucosal bleeding, all types of VWD	PO or IV	Aminocaproic acid: 100 mg/kg PO loading dose followed by 50 mg/kg q 6 hours§ Tranexamic acid: 1300 mg PO tid × 5 days

*Recommended treatment with Stimate brand nasal spray, as this form is concentrated to give 150 µg/spray. Other forms are much more dilute and will not result in desired increase in VWF.

†Maximum recommended dose is 20-30 µg/day.

‡Currently both Humate-P and Wilate are approved for treatment of VWD. A recombinant VWF preparation is currently undergoing clinical trials.

§Maximum recommended dose is 24 g/day.

IN, intranasal; IV, intravenous; PO, oral administration.