Thrombotic Thrombocytopenic Purpura

A diagnostic Emergency.

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Session Aims

01

TTP 101

Overview of the disorder and its classifications.

02

Diagnosing TTP

Full blood count, peripheral blood and differential diagnosis features.

03

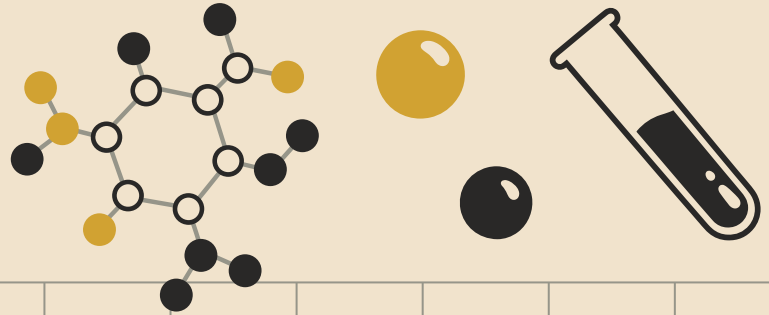
Managing TTP

How TTP is managed, and the laboraty's role.

04

Top Tips for Diagnosis

Things to consider to avoid missing a diagnosis.



TTP 101

Rare

Currently 6 six cases per million per year, the majority of which are female.

1º TTP

Presents in childhood. Results from a congenital lack of ADAMTS13

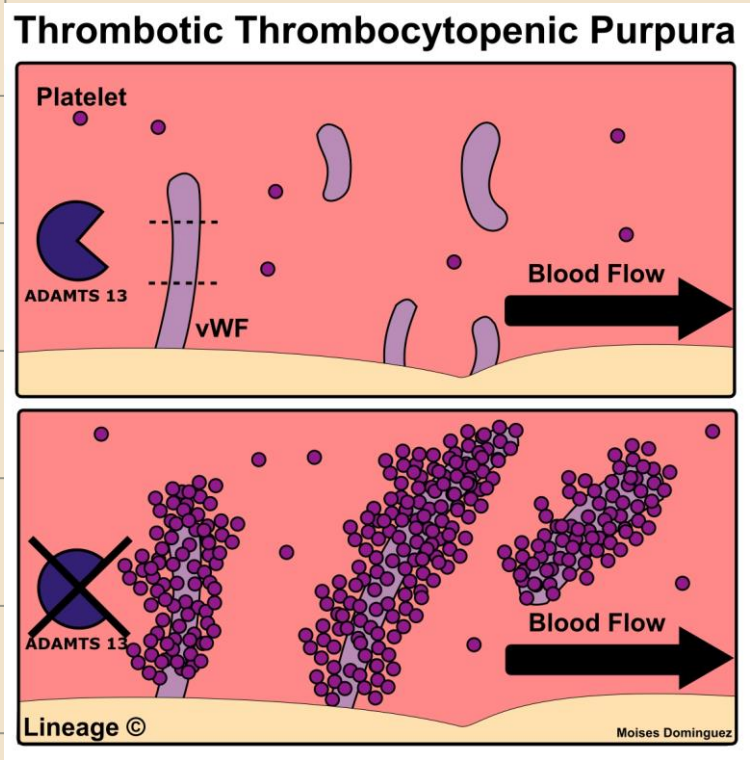
Difficult to Diagnose

There is much morphological and clinical crossover with other disorders, making it difficult to diagnose.

2º TTP

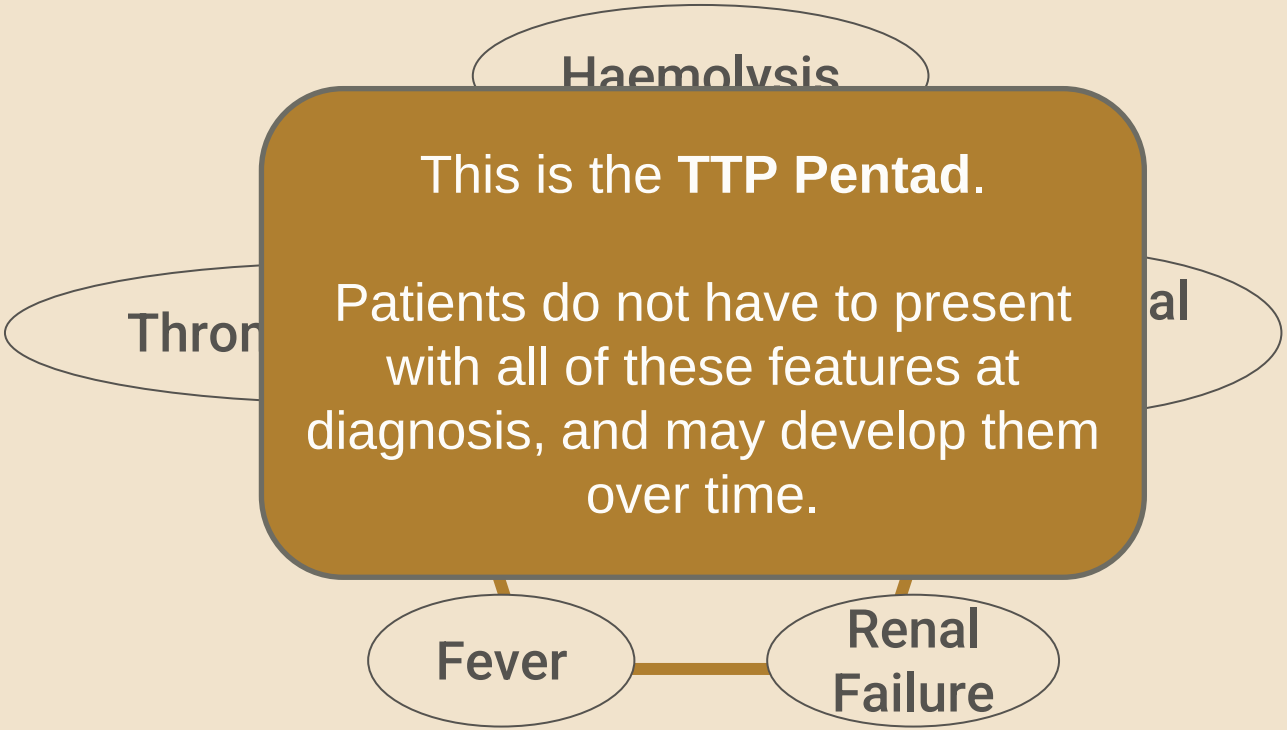
Presents in adulthood. Results from autoimmune response which removes ADAMTS13 from circulation

TTP 101

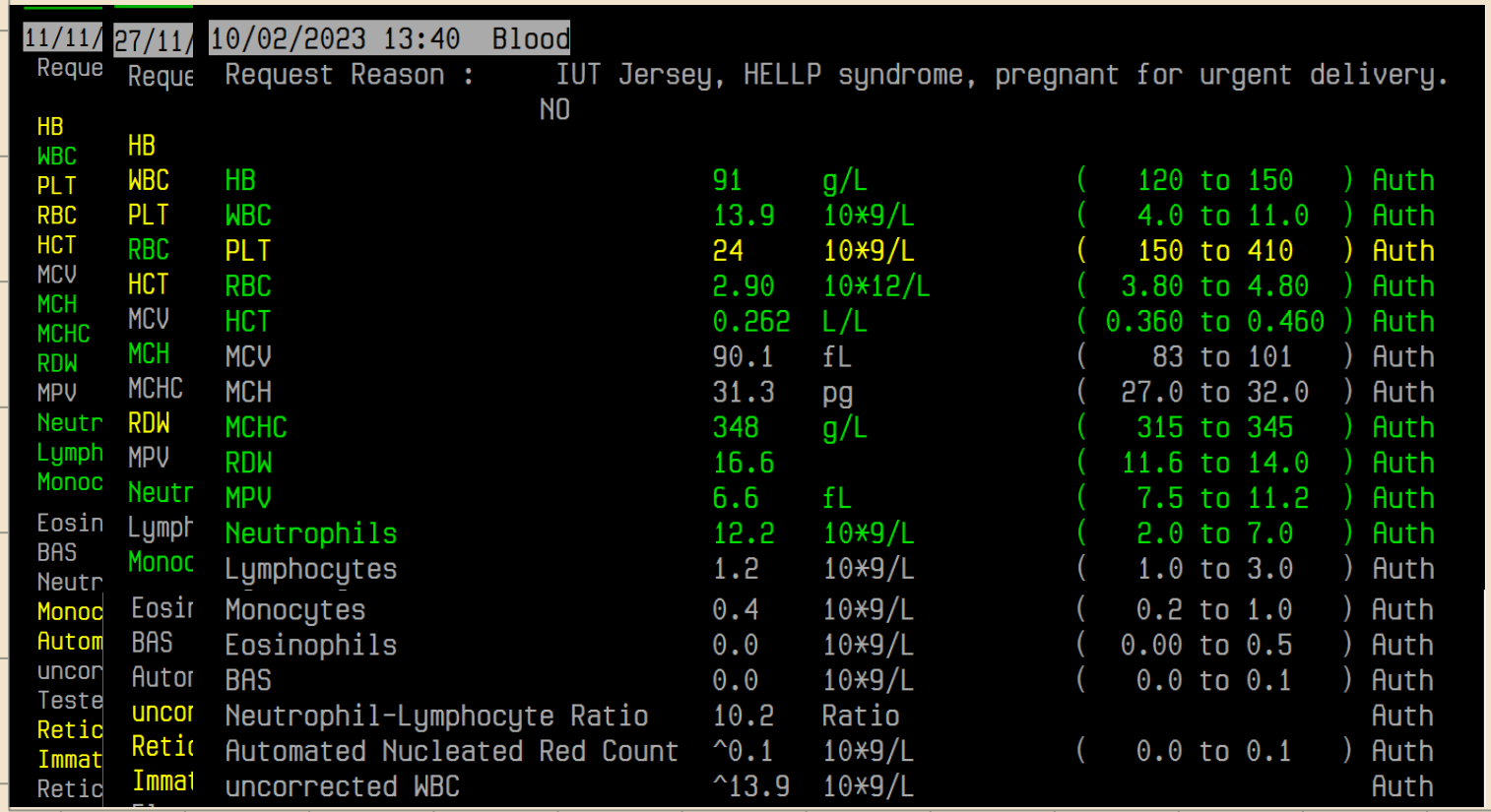


- Without ADAMTS13, vWF remains incredibly “sticky”
- It activates platelets, even without vascular damage.
- This produces small, unfixed clots which lodge in vessels.
- The resulting thrombocytopenia causes bleeding.

TTP Signs and Symptoms



FBC at Presentation



10/02/2023 13:40 Blood

Request Reason : IUT Jersey, HELLP syndrome, pregnant for urgent delivery.
NO

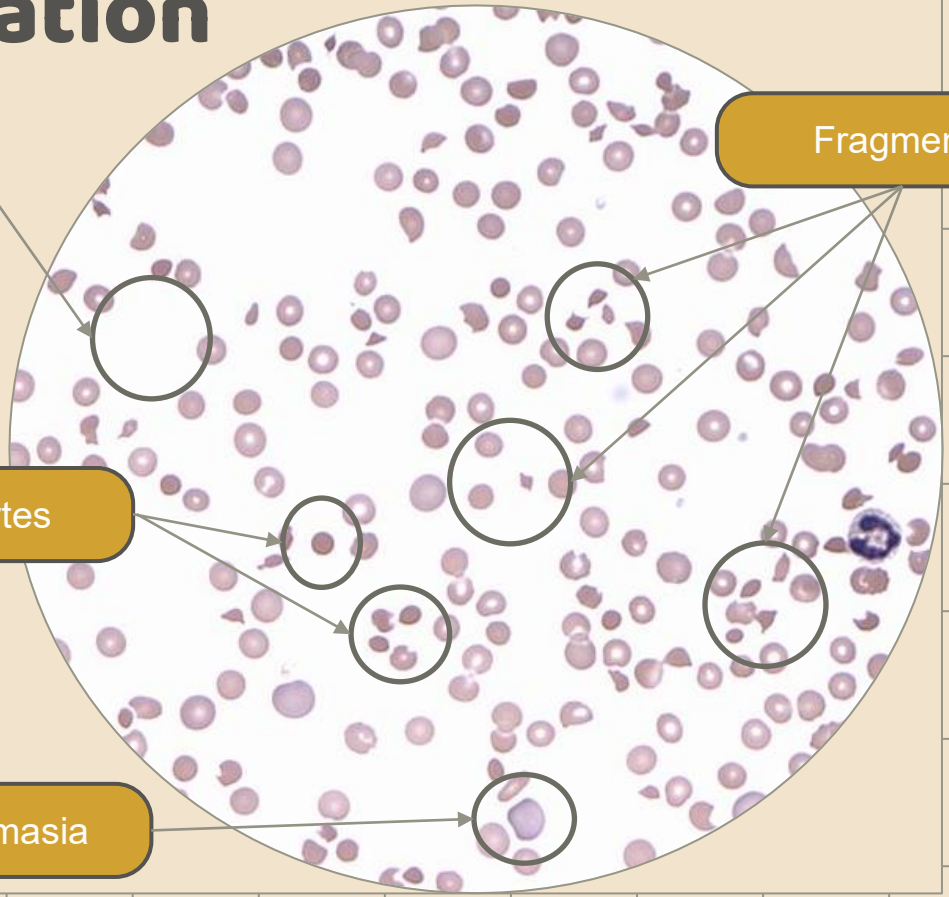
HB	91	g/L	(120 to 150)	Auth
WBC	13.9	10*9/L	(4.0 to 11.0)	Auth
PLT	24	10*9/L	(150 to 410)	Auth
RBC	2.90	10*12/L	(3.80 to 4.80)	Auth
HCT	0.262	L/L	(0.360 to 0.460)	Auth
MCV	90.1	fL	(83 to 101)	Auth
MCH	31.3	pg	(27.0 to 32.0)	Auth
MCHC	348	g/L	(315 to 345)	Auth
RDW	16.6		(11.6 to 14.0)	Auth
MPV	6.6	fL	(7.5 to 11.2)	Auth
Neutrophils	12.2	10*9/L	(2.0 to 7.0)	Auth
Lymphocytes	1.2	10*9/L	(1.0 to 3.0)	Auth
Monocytes	0.4	10*9/L	(0.2 to 1.0)	Auth
Eosinophils	0.0	10*9/L	(0.00 to 0.5)	Auth
BAS	0.0	10*9/L	(0.0 to 0.1)	Auth
Neutrophil-Lymphocyte Ratio	10.2	Ratio		Auth
Automated Nucleated Red Count	^0.1	10*9/L	(0.0 to 0.1)	Auth
uncorrected WBC	^13.9	10*9/L		Auth

Film at Presentation

True Thrombocytopenia

>5 fragments per high powered field (x60) is considered to be a significant number of fragments.

Spherocytes, fragments, bite cells, helmet cells etc. are all signs of haemolysis



Differential Diagnosis

Haemolytic Uraemic Syndrome

- Fragments
- Thrombocytopenia
- Normal clotting

Disseminated Intravascular Haemolysis

- Fragments
- Thrombocytopenia
- Deranged clotting

HELLP Syndrome

- Fragments
- Thrombocytopenia
- Normal clotting

Promyelocytic Leukaemia

- Fragments
- Thrombocytopenia
- Deranged clotting

Severe Megaloblastosis

- Fragments
- Thrombocytopenia
- Normal clotting

Autoimmune Haemolysis

- Fragments
- Normal platelets
- Normal clotting

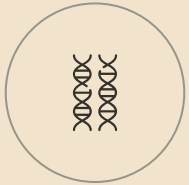
Confirmatory Tests

Test	Finding in TTP	Use in differential diagnosis
Clotting (INR/APTR/FIB)	Normal	Rules out DIC
Lactate Dehydrogenase	↑↑↑	Proves increased cell turnover
Direct Antiglobulin Test	Negative	Rules out AIHA
Haptoglobin	↓↓↓	Proves intravascular haemolysis
Reticulocytes	↑↑↑	Confirms marrow compensation
B12/Folate	Normal	Rules out megaloblastosis

ADAMTS13 Testing

Diagnostic

ADAMTS13 Activity of **<10IU/L** is diagnostic for TTP and rules out other disorders e.g. HUS.



Antibodies vs. Activity

Antibodies are found in secondary (aquired) TTP, but not in congenital TTP.

Methodology

Reference labs typically use ELISAs. There are new, validated methods available for activity, but can underestimate levels.

Management of TTP

Congenital

- These patients need ADAMTS13 replacement.
- This may be FFP or recombinant ADAMTS13.
- They DO NOT need plasma exchange.

Secondary

- Plasma exchange with a standardised plasma product.
- This continues until the platelets normalise.
- Additionally steroids are given.
- Red cells should be given to resolve anaemia.
- Platelets should ONLY be given in severe bleeding.

Why do we Worry?

TTP is FATAL!

Without prompt treatment, patients can suffer severe morbidity and mortality.

TTP is fatal in 50% of cases, if the patient is not treated within 24hours of presentation.

TTP is TREATABLE!

>90% of patients will make a full recovery from TTP if treated promptly.

The faster treatment started, the lower the risk of severe comorbidities.

TTP Considerations

Consider the clinical details e.g.

- Bruising
- Uncons
- Fever

Low platelets and low bin are a red flag!

Always c platelet c genuine- before phoning it!

>5 per high d field is significant haemolysis.

New presentation of **excess fragments, Low Hb and Low Platelets** should ALWAYS be phoned to the requester and URGENTLY passed to a clinical haematologist.

Thanks!

Do you have any questions?

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