# Microangiopathie thrombotique: Les pièges de la schizocytoses

A.Lionet
P. Chamley

SFH - Montpellier

7/11/2018

# Les microangiopathies thrombotiques

=AH mécanique + Thrombopénie + Coombs négatif

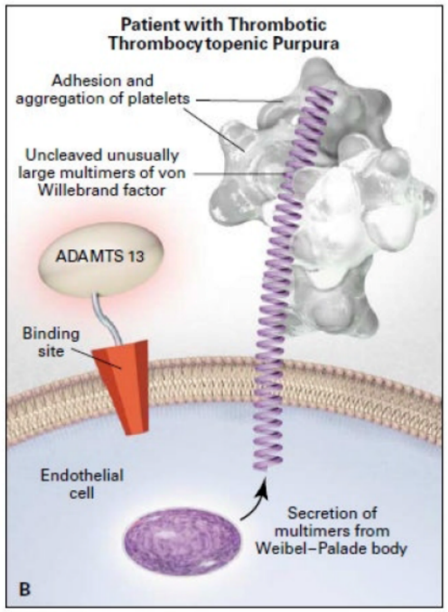
schizocytes

# Les microangiopathies thrombotiques

=AH mécanique + Thrombopénie + Coombs négatif

schizocytes

**PTT :**
**pathology de l'ADAMTS-13**

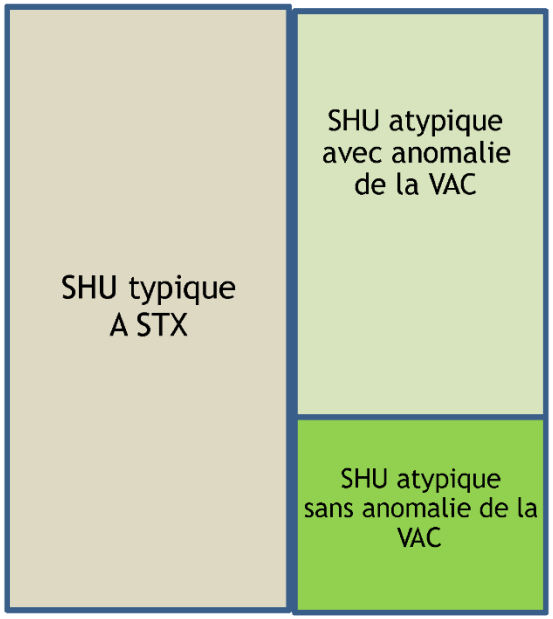



Moake NEJM 2002

| | Clinical diagnosis* | |
|---|---|---|
| | TTP | HUS |
| **Number of subjects** | 66 | 45 |
| **Clinical characteristics•** | | |
| Hemolytic anemia | 100 | 100 |
| Thrombocytopenia | 94 | 60 |
| Neurologic changes | **90** | 15 |
| Fever | 50 | 21 |
| Acute anuric renal failure | 2 | **98** |
| **Laboratory findings•** | | |
| Mean platelet count (per µL) | 35,000 | 95,000 |
| Mean creatinine (mg/dL) | 1.8 | 4.1 |
| Decreased protease activity | 89 | 13 |
| Protease inhibitor present | 51 | 0 |

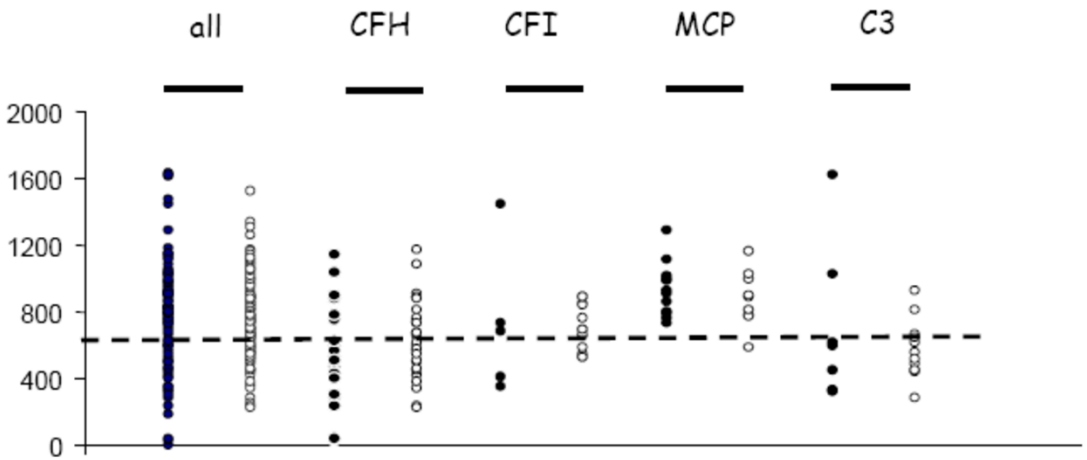
Veyradier, A, 2001, *Blood* 98:1765-1772.

**SHU :**
**plus polymorphe**



# Anomalies du complément et SHU*a*

## Complement assays



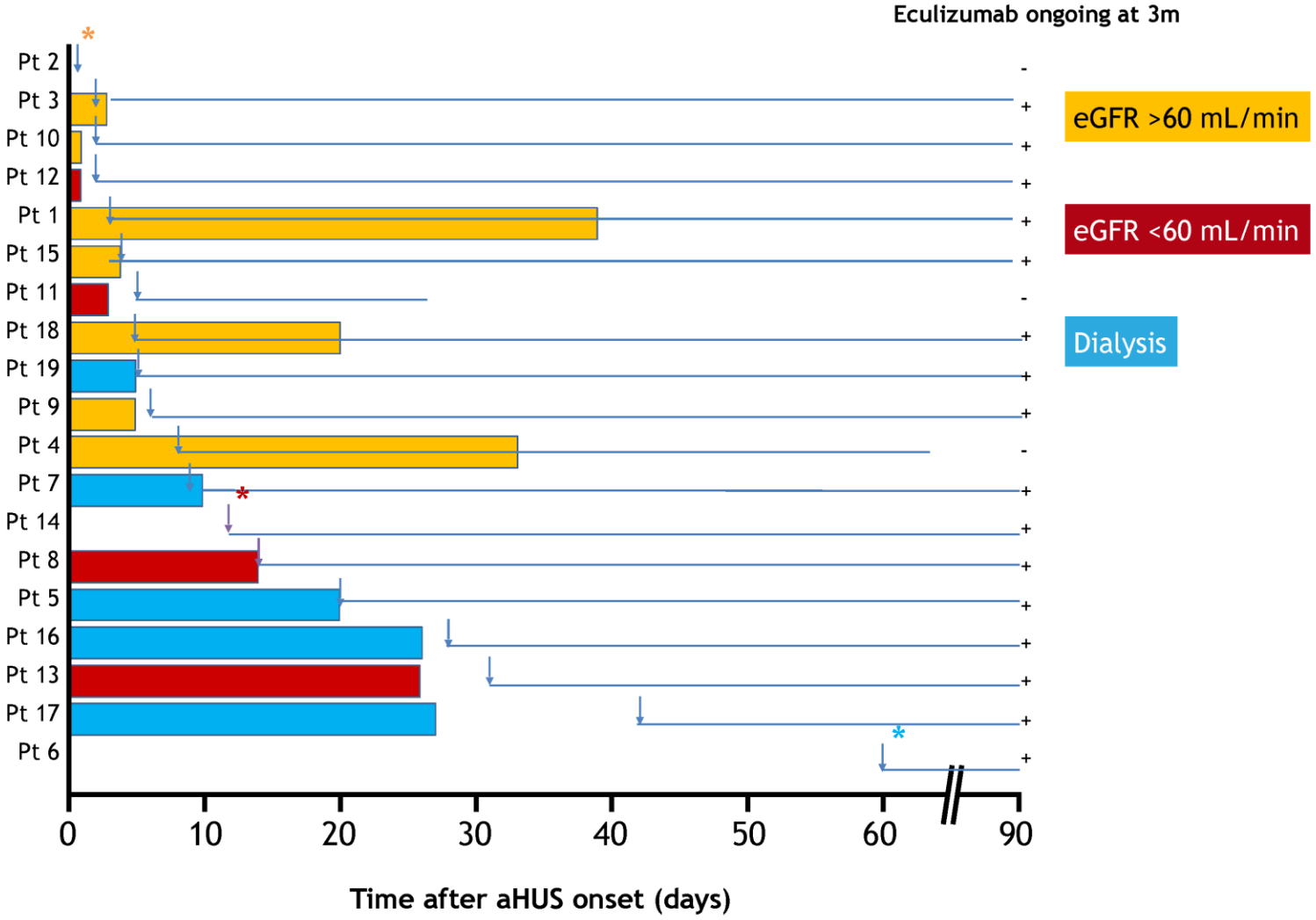

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pediatric onset | + | | + | | + | | + | | + | |
| Adult onset | | + | | + | | + | | + | | + |
| Low C3 (%) | 31 | 39 | 70 | 52 | 60 | 50 | 0 | 11 | 70 | 85 |

**Normal complement levels do not exclude aHUS diagnosis**

**Genetics and Outcome of Atypical Hemolytic Uremic Syndrome: A Nationwide French Series Comparing Children and Adults** *Véronique Fremeaux-Bacchi, Fadi Fakhouri,*

# Insights from use in clinical practice of eculizumab in adult patients with aHUS affecting the native kidneys: an analysis of 19 cases

**Early Ecu intiation = Better renal outcome**




Fakhouri F et al. Am J Kidney Dis 2014;63:40-48

CM Legendre, NEJM, 2013

# PTT

**Urgence thérapeutique**

Longer delay in initiating plasma exchanges, presence of stupor or coma, and higher creatinine levels at the beginning of plasma exchanges were independent predictors of treatment failure.

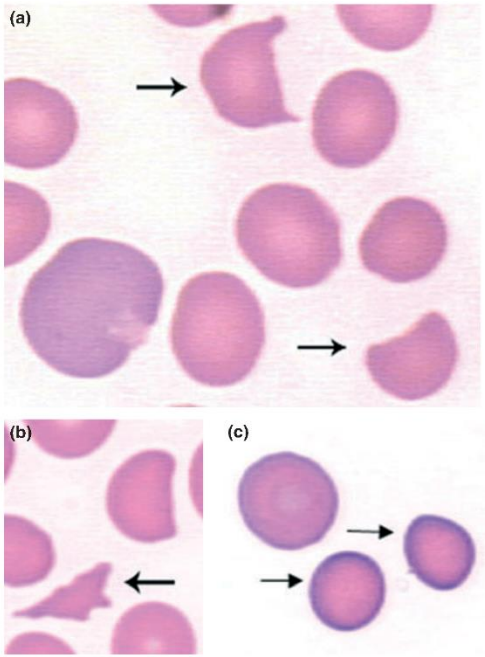
Perrera, Ann Hematology, 1995

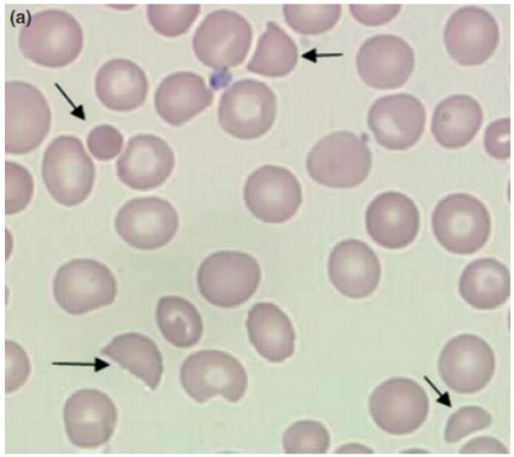
> **3 In view of the high risk of preventable, early deaths in TTP, treatment with PEX should be initiated as soon as possible, preferably within 4–8 h, regardless of the time of day at presentation, if a patient presents with a MAHA and thrombocytopenia in the absence of any other identifiable clinical cause (1B).**

Scully, BJH, 2012

# Schizocytes

# Qu'est ce qu'un schizocyte ?




Keratocytes (cornes)
Microspherocyte
Chapeau de gendarme (helmet)

- Les hématies crénelées, spiculées sont à rejeter.
- Les termes hématie mordue, hématie de taille diminuée et déformée de manière importante, et hématie en virgule ou en bâtonnet sont discutables.

*Zini, Int Jnl Lab Hem, 2011*

# Standardisation de l'évaluation des schizocytes

Table 1. International Council for Standardization in Haematology recommendations for schistocyte counting

1. Schistocytes should be evaluated on peripheral blood smears using an optical microscope at medium magnification and estimated as a percentage after counting at least 1000 red blood cells
2. A schistocyte count should be requested and carried out when a diagnosis of thrombotic microangiopathies caused by red cell mechanical damage is suspected, usually in patients with thrombocytopenia
3. Schistocytes should be identified by specific positive morphological criteria. Schistocytes are always smaller than intact red cells and can have the shape of fragments with sharp angles and straight borders, small crescents, helmet cells, keratocytes, or microspherocytes*
4. A schistocyte count should be considered clinically meaningful if schistocytes represent the main morphological red blood cells abnormality in the smear (other than signs of erythropoietic regeneration)
5. A robust morphological indication for the diagnosis of thrombotic microangiopathic anemia in adults should be recognized when the percentage of schistocytes is above 1%
6. Fragmented red cell enumeration by automated blood cell counters should be considered a useful complement to microscopic evaluation, as it provides rapid results with a high predictive value of negative samples. A microscope check is needed for positive and macrocytic samples†

*Microspherocytes only in the presence of other mentioned RBC shapes.
†Macrocytic samples are at risk of underestimation or absence of flag ('false-negative' test).

International Schistocyte Working groupe (ICSH).J F Lesesve Nancy

*Int. Jnl. Lab. Hem.* 2012, **34**, 107–116

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# Tous cela n’est pas qu’un concept…

Erreur N°1
Erreur d’analyse.
Dysmorphies érythrocytaires

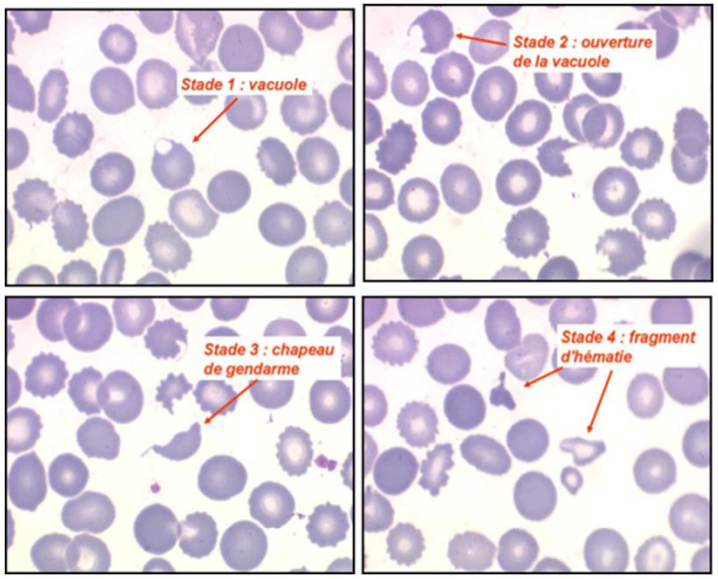
Erreur N°2
Erreur d’interprétation,
La shizocytose ne fait pas la MAT

# Dysmorphie érythrocytaire

Sans (ou peu) de schizocyte, autres atteintes des lignés possibles

**Grandes dysérythropoïèses :**
- Sepsis
- Carences en vit B12
- SAM et  Nécrose médullaire

**Anémies Hémolytiques** :
- Médicamenteuse (ACADIONE),
- Immune
- Infectieuses
- Corpusculaire : Beta-thalassemie majeur et déficit en G6PD (associé à des “bite-cell = phagocytose d’une partie des GR par les macrophage de la rate)
- Hépatopathies sévères (syndrome de Zieve)
- Grands brûlés (parfois les hyperthermies majeures)

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# Glucose-6-Phosphate Dehydrogenase Deficiency Mimicking Atypical Hemolytic Uremic Syndrome

*Patrick R. Walsh, Sally Johnson, Vicky Brocklebank, Jacobo Salvatore, Martin Christian, and David Kavanagh*

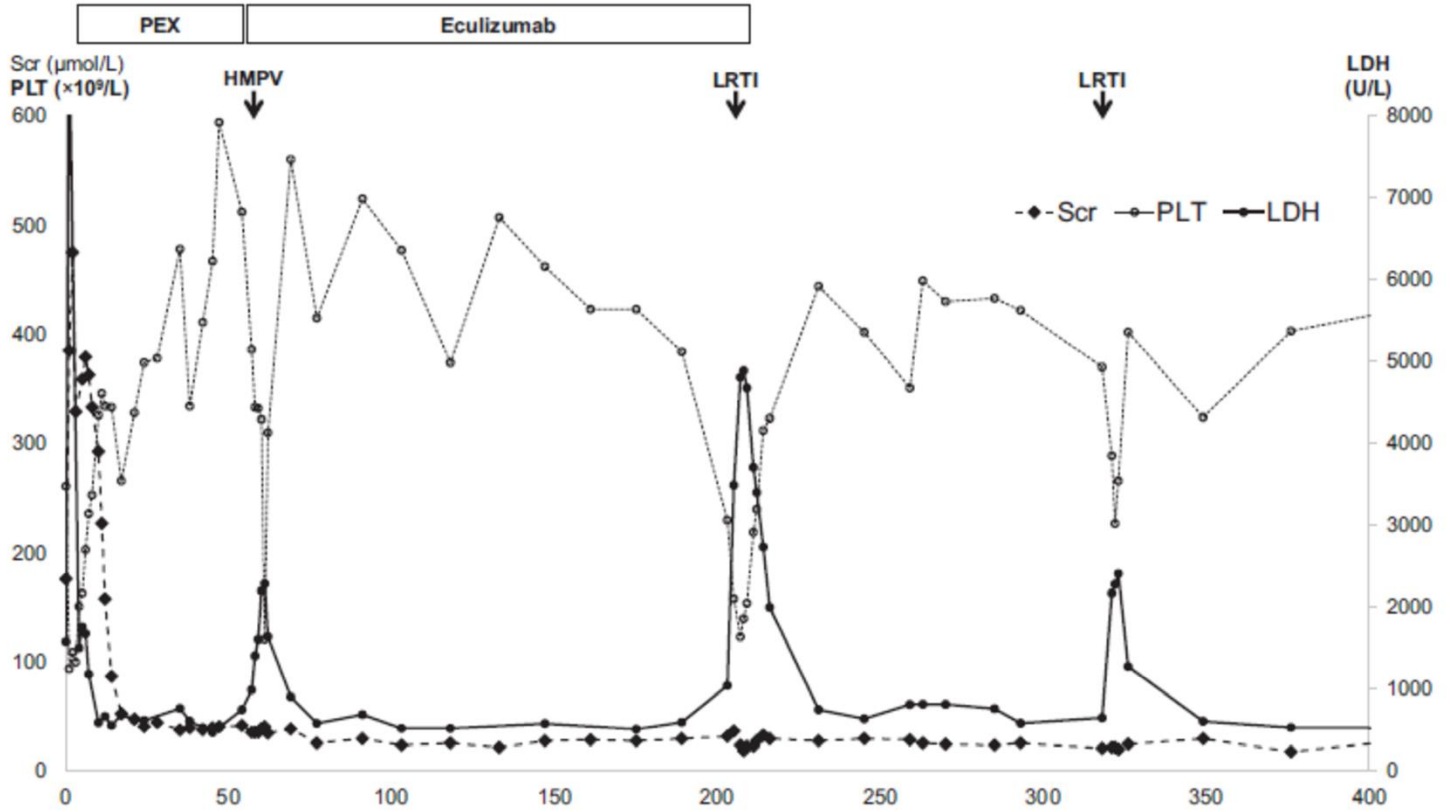



**Figure 1.** Clinical course. Serum creatinine (Scr), lactate dehydrogenase (LDH), and platelet (PLT) count values plotted over the first 400 days following the initial presentation. Clinical interventions with plasma exchange (PEX) and eculizumab are shown above. Arrows demonstrate infectious triggers (human metapneumovirus [HMPV], lower respiratory tract infection [LRTI]). Conversion factor for Scr in µmol/L to mg/dL, ÷88.4.

# Mme D

45 ans. Syndrome anxio-depressif. Troubles neurologiques aigues. IOT=>réanimation

| | 25/07/2016 |
|---|---|
| LEUCOCYTES | 11.40 |
| HEMOGLOBI | 8.4 |
| VGM | 104.7 |
| NUM PLAQUE | 21 |
| CRP | 94 - H |
| TROPONINE | 73 |
| TCA MALADE | 31 |
| UREE | 1.95 - H |
| CREATININE | 46 |
| LDH | 12607 - H |
| TGO | 2715 - H |
| TGP | 2609 - H |
| PAL | 94 |
| BILI TOTALE | 72 - H |
| GGT | |
| FERRITINE | >10000 |
| FOLATES SER | 3.1 |
| VITAMINE B1 | >1.0 |
| HAPTOGLOB | <0.07 - L |

FV15%

Schizocytes 1 à 2%

Poïkilocytose
Polychromasie
Anisocytose

# Mme D

45 ans. Syndrome anxio-depressif. Troubles neurologiques aigues. IOT=>réanimation

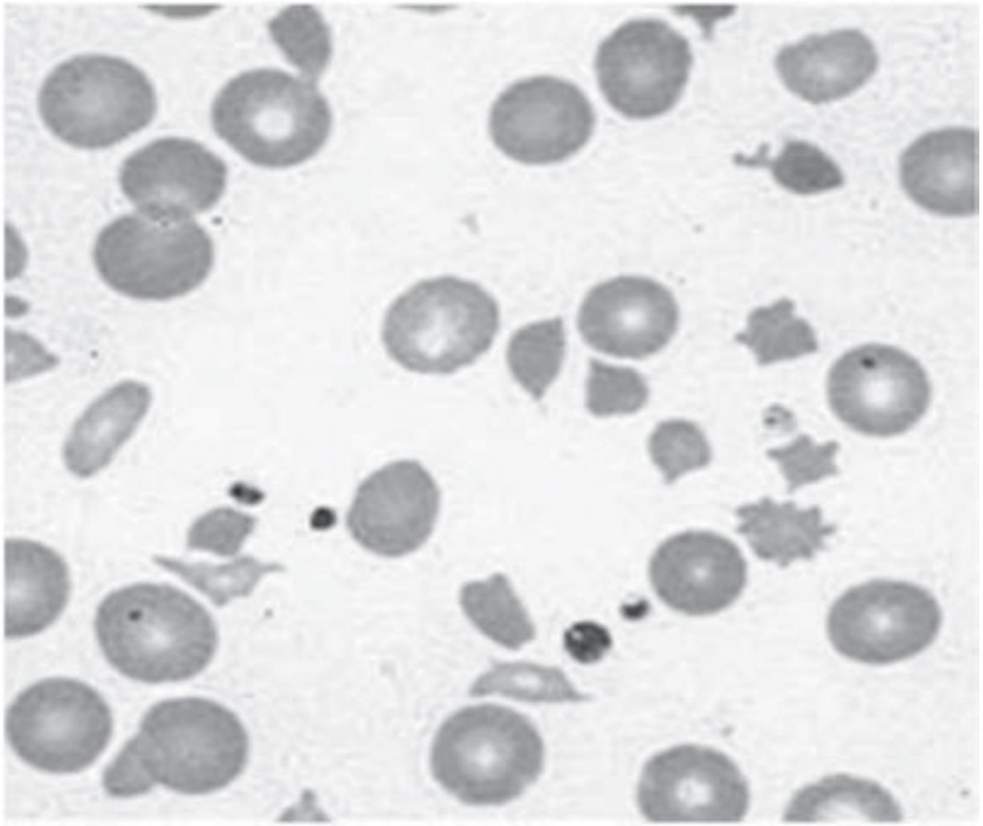
| | 25/07/2016 | 26/07/2016 | 27/07/2016 | 28/07/2016 | 29/07/2016 | 30/07/2016 | 31/07/2016 | 01/08/2016 |
|---|---|---|---|---|---|---|---|---|
| LEUCOCYTES | 11.40 | 6.69 | 6.46 | 9.00 | 10.03 | 12.90 | 14.51 | 13.14 |
| HEMOGLOBI | 8.4 | 8.4 | 8.4 | 7.6 | 7.7 | 7.3 | 9.6 | 8.9 |
| VGM | 104.7 | VGM no | VGM no | 103.1 | 102.7 | 105.1 | 96.9 | |
| NUM PLAQUE | 21 | 42 | 34 | 32 | 42 | 67 | 115 | 166 |
| CRP | 94 - H | 63 - H | 48 - H | 45 - H | 42 - H | 48 - H | | 32 - H |
| TROPONINE | 73 | 38 | 23 | 24 | | | | 38 |
| TCA MALADE | 31 | 32 | 31 | 31 | 29 | 29 | 30 | 36 |
| UREE | 1.95 - H | 0.84 - H | 0.57 - H | 0.29 | 0.36 | 0.79 - H | 0.59 - H | 0.87 - H |
| CREATININE | 46 | 26 | 20 | 15 | 17 | 41 | 37 | 53 |
| LDH | 12607 - H | | | | | 1419 - H | | |
| TGO | 2715 - H | 795 - H | 538 - H | 203 - H | 100 - H | 58 - H | | 31 - H |
| TGP | 2609 - H | 1514 - H | 1347 - H | 798 - H | 509 - H | 330 - H | | 142 - H |
| PAL | 94 | 73 | 72 | 73 | 92 | 107 - H | | 118 - H |
| BILI TOTALE | 72 - H | 118 - H | 122 - H | 113 - H | 99 - H | 84 - H | | 57 - H |
| GGT | | 36 - H | 37 - H | 36 - H | | | | 69 - H |
| FERRITINE | >10000 | | | | | | | |
| FOLATES SER | 3.1 | | | | | | | |
| VITAMINE B1 | >1.0 | | | | | | | |
| HAPTOGLOB | <0.07 - L | | | | | <0.07 - L | | |

FV15% → FV80%

Schizocytes 1 à 2%

Poïkilocytose
Polychromasie
Anisocytose

ADAMTS 13 normale
Pas d'anomalie du Complément



Senatore, Am J GastroEnt, 2016

# Madame B

Madame B 70 ans:

- Hypertension artérielle ;
- Adénocarcinome colique avec extension hépatique, opéré il y a 2 ans et pris en charge par chimiothérapie notamment par FOLFOX.

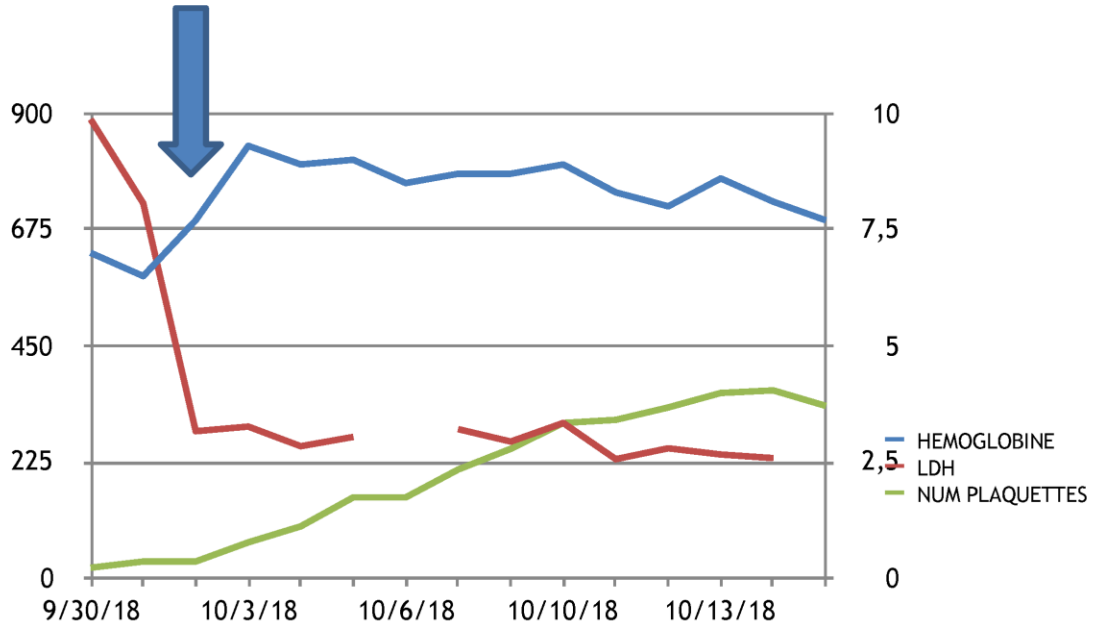
=>Récemment mise en évidence d'une poursuite évolutive hépatique péritonéale et pulmonaire avec un statut KRAS sauvage pour laquelle la patiente a déjà reçu 3 cures de chimiothérapie par FOLFOX VECTIBIX.

| B- ANNIE | 30/09/2018 |
|---|---|
| LEUCOCYTES | 7,15 |
| HEMOGLOBINE | 7 |
| VGM | 92,7 |
| POLY NEUTRO ABS | 5,8 |
| LYMPHO ABS | 0,2 |
| NUM PLAQUETTES | 21 |
| reticulocytes % | 3 |
| CRP | 60 |
| TROPONINE T (TnThs) | 15 |
| CPK | 14 |
| CREATININE | 74 |
| LDH | 888 |
| HAPTOGLOBINE | <0,08 |
| DIURESE 24H | 0,5 |
| PROTEINES URINE/L | 0,34 |

Hyposegmentation du noyau des granulocytes (CHX)
Anisochromie
Poïkilocytose
Corps d'Howell-Jolly
Anisocytose

# Madame B

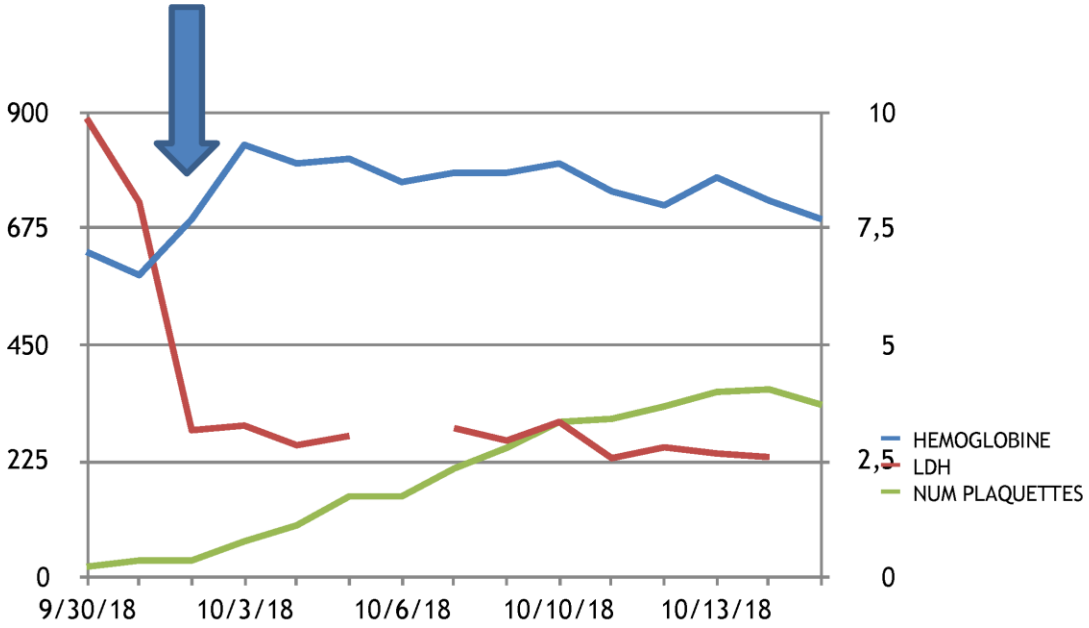
Échange plasmatique 100% PFC




schizo +

# Madame B

Échange plasmatique 100% PFC

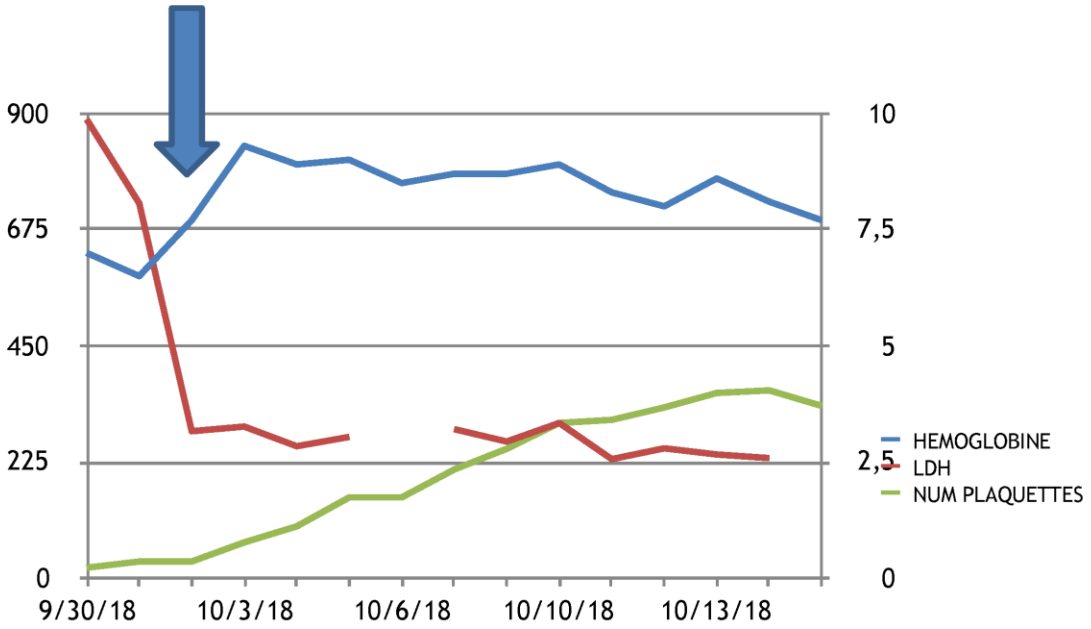



schizo +

**Test direct à l'antiglobuline positif de type mixte (IgG + complément)**
**Ac anti Plaquettaire en cours**

# Madame B

Échange plasmatique 100% PFC




schizo +

**Test direct à l'antiglobuline positif de type mixte (IgG + complément)**
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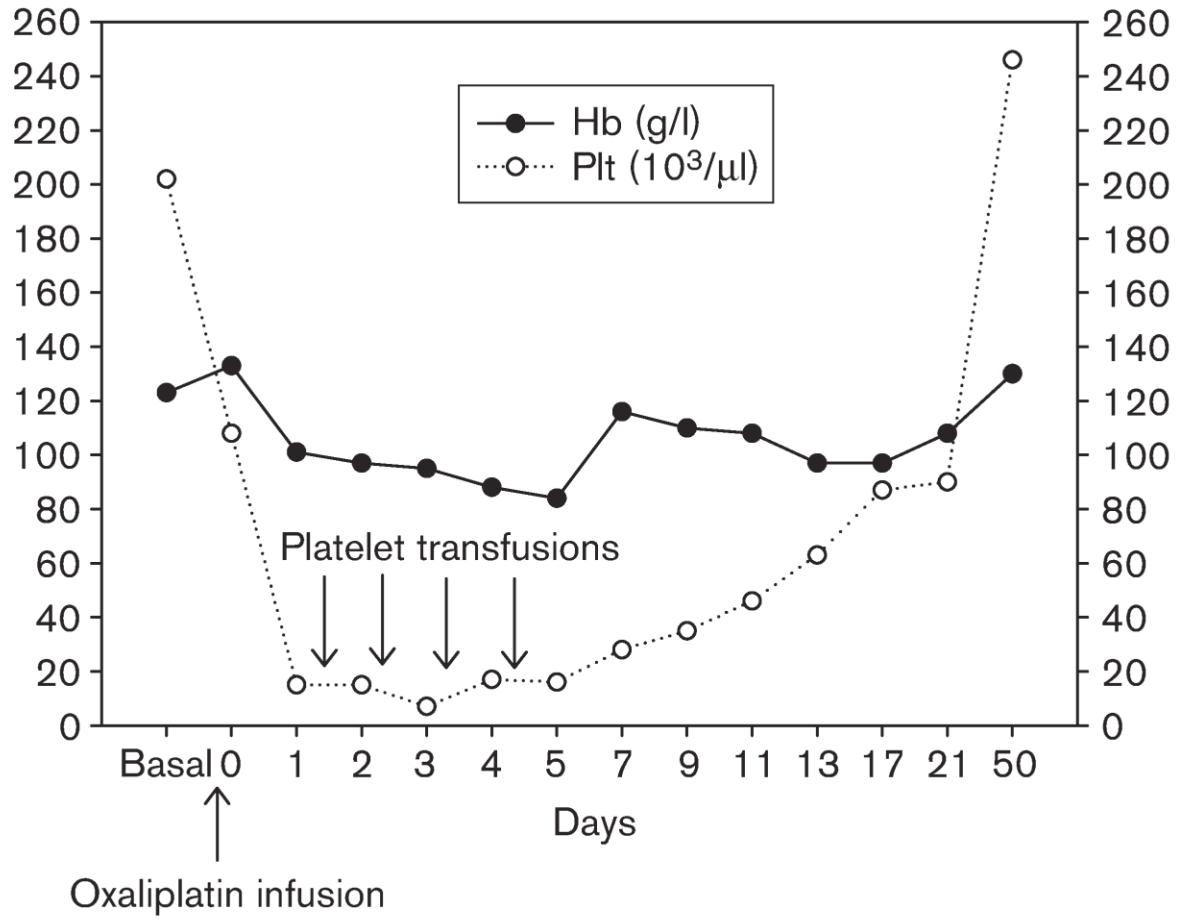
**PBR : néphrite aigue immunoallergique**

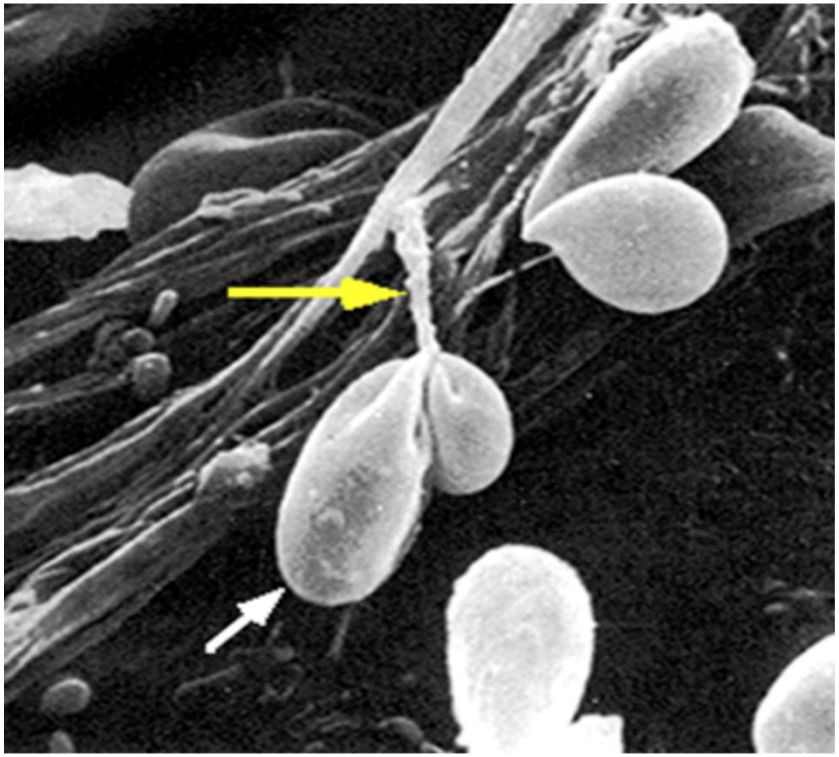



**Oxaliplatin-induced immune hemolytic anemia: a case report and review of the literature**

Francesc Cobo[a], Guillem De Celis[b], Arturo Pereira[c], Xavier Latorre[b], Jaume Pujadas[a] and Santiago Albiol[a]

*l'hirondelle ne fait pas le printemps….*

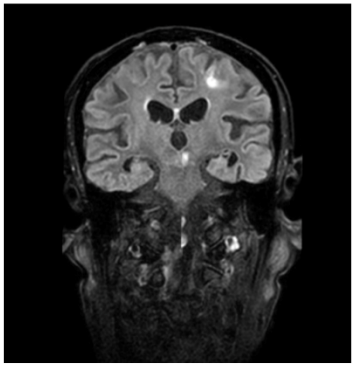
*……la shizocytose ne fait pas la MAT*

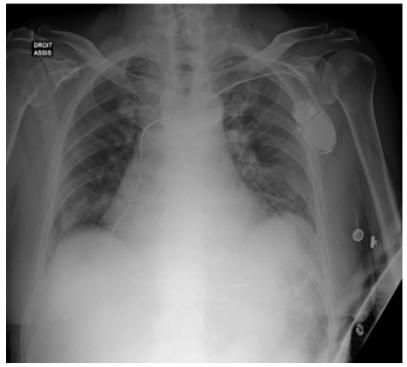


PTT/HUS

Obstacles mécaniques
Desinsertion valves
Un circuit de dialyse ou d'EP
CIVD
CIVL : Hémangiomes caverneux
Myélofibrose

# Mr P





72 ans. TAVI, maladie oreillette.
Cancer de prostate ? Tassement T11-RaO-DNID-AOMI.
Arrêt AVK/relais calciparine.
Troubles neurologiques aigues  PL, Zovirax
Elévation troponine, USIC = KT => coma => réa

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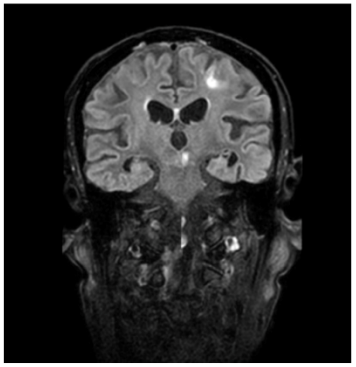

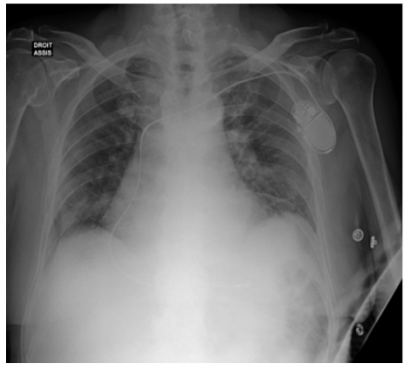

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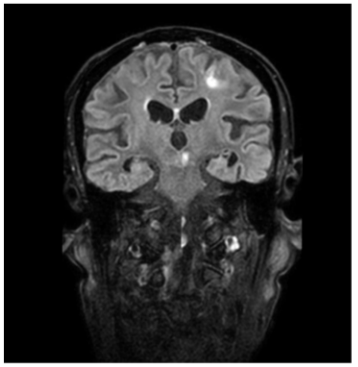
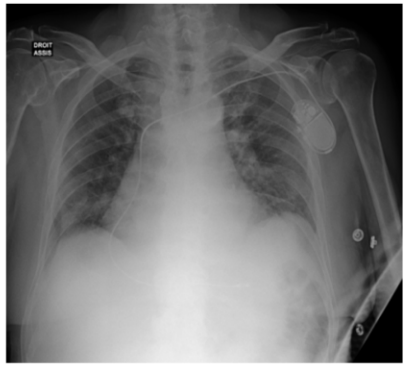
| | 29/09/2016 |
|---|---|
| LEUCOCYTES | 14.15 |
| HEMOGLOBINE | 10.5 |
| VGM | [illegible] |
| NUM PLAQUETTES | 48 |
| CRP | |
| TROPONINE T | |
| UREE | 1.06 - H |
| CREATININE | 46 |
| SODIUM | [illegible] |
| POTASSIUM | 4.9 |
| ACIDE URIQUE | 35 |
| PROTEINES | 55 - L |
| LDH | 733 - H |
| TGO | 55 - H |
| TGP | 32 |
| PAL | 63 |
| BILI TOTALE | [illegible] |
| HAPTOGLOBINE | 0.18 - L |

# Mr P





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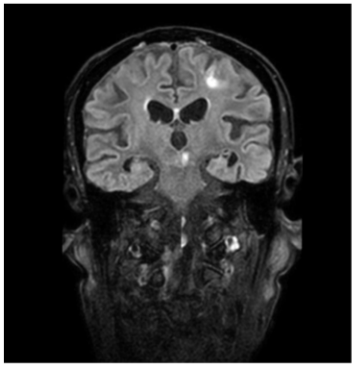
Troubles neurologiques aigues  PL, Zovirax
Elévation troponine, USIC = KT => coma => réa

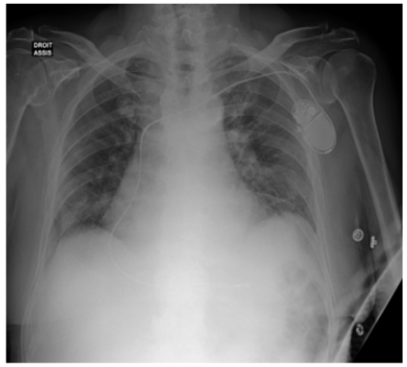
| | 29/09/2016 | 30/09/2016 | 01/10/2016 |
|---|---|---|---|
| LEUCOCYTES | 14.15 | 12.07 | 14.04 |
| HEMOGLOBINE | 10.5 | 10.0 | 9.9 |
| VGM | 102.8 | 105.4 | 104.3 |
| NUM PLAQUETTES | 48 | 47 | 80 |
| CRP | | 183 - H | |
| TROPONINE T | | | |
| UREE | 1.06 - H | 0.84 - H | 0.61 - H |
| CREATININE | 46 | 31 | 20 |
| SODIUM | 135 | 138 | 141 |
| POTASSIUM | 4.9 | 3.7 | 3.8 |
| ACIDE URIQUE | 35 | | |
| PROTEINES | 55 - L | 50 - L | 55 - L |
| LDH | 733 - H | 838 - H | 574 - H |
| TGO | 55 - H | | |
| TGP | 32 | | |
| PAL | 63 | | |
| BILI TOTALE | 9 | | |
| HAPTOGLOBINE | 0.18 - L | 0.20 - L | 0.37 |

ADAMTS13, et complement normaux

Schizocytes 1 à 2%,

# Mr P





72 ans. TAVI, maladie oreillette.
Cancer de prostate ? Tassement T11-RaO-DNID-AOMI.
Arrêt AVK/relais calciparine.
Troubles neurologiques aigues  PL, Zovirax
Elévation troponine, USIC = KT => coma => réa

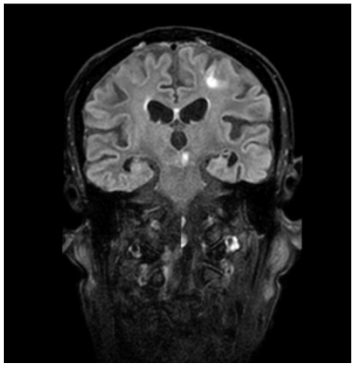
| | 29/09/2016 | 30/09/2016 | 01/10/2016 |
|---|---|---|---|
| LEUCOCYTES | 14.15 | 12.07 | 14.04 |
| HEMOGLOBINE | 10.5 | 10.0 | 9.9 |
| VGM | 102.8 | 105.4 | 104.3 |
| NUM PLAQUETTES | 48 | 47 | 80 |
| CRP | | 183 - H | |
| TROPONINE T | | | |
| UREE | 1.06 - H | 0.84 - H | 0.61 - H |
| CREATININE | 46 | 31 | 20 |
| SODIUM | 135 | 138 | 141 |
| POTASSIUM | 4.9 | 3.7 | 3.8 |
| ACIDE URIQUE | 35 | | |
| PROTEINES | 55 - L | 50 - L | 55 - L |
| LDH | 733 - H | 838 - H | 574 - H |
| TGO | 55 - H | | |
| TGP | 32 | | |
| PAL | 63 | | |
| BILI TOTALE | 9 | | |
| HAPTOGLOBINE | 0.18 - L | 0.20 - L | 0.37 |

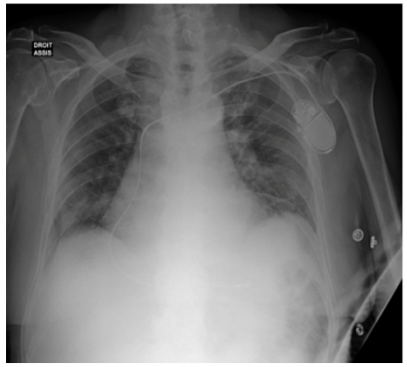
ADAMTS13, et complement normaux

Schizocytes 1 à 2%,

ETO : volumineux
Thrombus dans l'auricule gauche

# Mr P



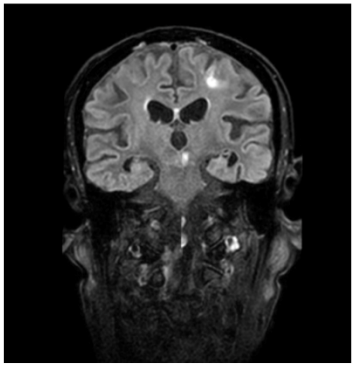


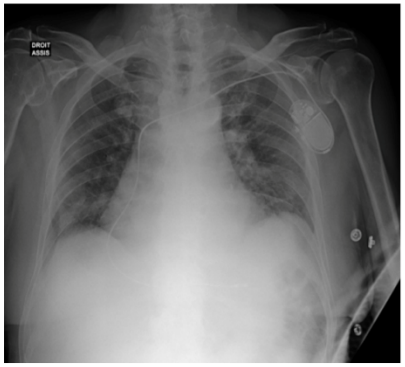
72 ans. TAVI, maladie oreillette.
Cancer de prostate ? Tassement T11-RaO-DNID-AOMI.
Agravation neurologique le 03/10/2016
Encéphalopathie aux betalactamines ?

| | 02/10/2016 | 03/10/201 |
|---|---|---|
| LEUCOCYTES | 13.99 | 17.74 |
| HEMOGLOBI | 9.5 | 9.3 |
| VGM | 104.5 | 105.0 |
| NUM PLAQUE | 70 | 79 |
| CRP | | 97 - H |
| TROPONINE T (TnThs) | | |
| UREE | 0.59 - H | 0.66 - H |
| CREATININE | 18 | 19 |
| SODIUM | 142 | 141 |
| POTASSIUM | 3.5 | 3.5 |
| ACIDE URIQUE | | |
| PROTEINES | 51 - L | 52 - L |
| CALCIUM | 86 | 87 |
| LDH | | 659 - H |
| TGO | | |
| TGP | | |
| PAL | | |
| BILI TOTALE | | |
| HAPTOGLOB | 0.42 | 0.26 - L |

Schizocytes 1 à 2%,

# Mr P





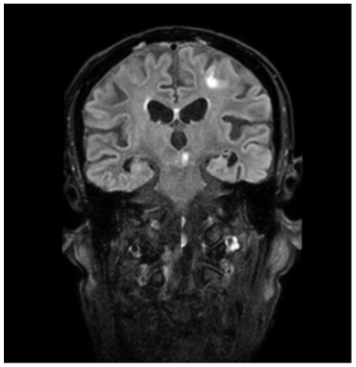
72 ans. TAVI, maladie oreillette.
Cancer de prostate ? Tassement T11-RaO-DNID-AOMI.
Agravation neurologique le 03/10/2016
Encéphalopathie aux betalactamines ?

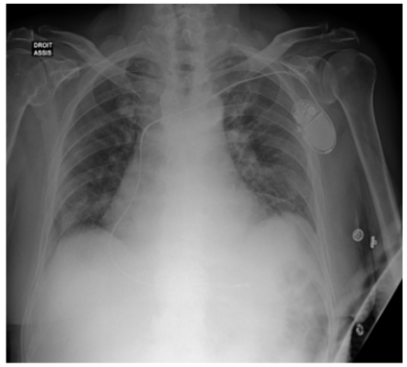
| | 02/10/2016 | 03/10/2016 | 04/10/2016 |
|---|---|---|---|
| LEUCOCYTES | 13.99 | 17.74 | 20.89 |
| HEMOGLOBI | 9.5 | 9.3 | 9.1 |
| VGM | 104.5 | 105.0 | 104.7 |
| NUM PLAQUE | 70 | 79 | 67 |
| CRP | | 97 - H | |
| TROPONINE T (TnThs) | | | |
| UREE | 0.59 - H | 0.66 - H | 0.91 - H |
| CREATININE | 18 | 19 | 25 |
| SODIUM | 142 | 141 | 140 |
| POTASSIUM | 3.5 | 3.5 | 4.0 |
| ACIDE URIQUE | | | |
| PROTEINES | 51 - L | 52 - L | 48 - L |
| CALCIUM | 86 | 87 | 82 - L |
| LDH | | 659 - H | 725 - H |
| TGO | | | |
| TGP | | | |
| PAL | | | |
| BILI TOTALE | | | |
| HAPTOGLOB | 0.42 | 0.26 - L | 0.12 - L |

Schizocytes 1 à 2%,

Schizocytes 6 à 10%

# Mr P





72 ans. TAVI, maladie oreillette.
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Encéphalopathie aux betalactamines ?

| | 02/10/2016 | 03/10/2016 | 04/10/2016 |
|---|---|---|---|
| LEUCOCYTES | 13.99 | 17.74 | 20.89 |
| HEMOGLOBINE | 9.5 | 9.3 | 9.1 |
| VGM | 104.5 | 105.0 | 104.7 |
| NUM PLAQUETTES | 70 | 79 | 67 |
| CRP | | 97 - H | |
| TROPONINE T (TnThs) | | | |
| UREE | 0.59 - H | 0.66 - H | 0.91 - H |
| CREATININE | 18 | 19 | 25 |
| SODIUM | 142 | 141 | 140 |
| POTASSIUM | 3.5 | 3.5 | 4.0 |
| ACIDE URIQUE | | | |
| PROTEINES | 51 - L | 52 - L | 48 - L |
| CALCIUM | 86 | 87 | 82 - L |
| LDH | | 659 - H | 725 - H |
| TGO | | | |
| TGP | | | |
| PAL | | | |
| BILI TOTALE | | | |
| HAPTOGLOB | 0.42 | 0.26 - L | 0.12 - L |

| | 04/10/2016 | 05/10/2016 | 06/10/2016 |
|---|---|---|---|
| LEUCOCYTES | 20.89 | 23.46 | 20.32 |
| HEMOGLOBINE | 9.1 | 8.8 | 9.0 |
| VGM | 104.7 | 103.7 | 105.5 |
| NUM PLAQUETTES | 67 | 82 | 126 |
| CRP | | 34 - H | 19 - H |
| UREE | 0.91 - H | 0.69 - H | 0.72 - H |
| CREATININE | 25 | 21 | 21 |
| LDH | 725 - H | 621 - H | 555 - H |
| HAPTOGLOBINE | 0.12 - L | 0.24 - L | 0.26 - L |

Schizocytes 1 à 2%,

Schizocytes 6 à 10%

ETO de contrôle : thrombus de l'auricule absent
+ dé-insertion avec fuite importante du TAVI

# Allogreffe de moelle

**Evaluation of schistocyte monitoring after haematopoietic stem cell transplantation**

J.-F. LESESVE*, F. ALLA†, F. DUGUÉ‡, S. SALIGNAC*, L¦ CLÉMENT‡, T. LECOMPTE*, P. BORDIGONI‡

125 greffes moelle 50 jours :
- 80% schizocytes en moyen à 0,7%
- 1 à 4% : GVHa, GVHc,MVO du foie, hépatite cholestatique, hémorragie vesicale, infection pulmonaire.
- >5% MAT

*International journal of hematology 2010*

# Attention a l'analyse séquencielle

# Mm S-R

55 ans

Asthénie, consultation cardiologue, urgence

| S R | 19/09/2018 |
|---|---|
| LEUCOCYTES | 6,09 |
| HEMOGLOBINE | 12.5 |
| reticulocytes | |
| NUM PLAQUETTES | 38 |
| CREATININE | 6 |
| LDH | 470 |
| HAPTOGLOBINE | <0,08 |
| PROTEINES URINE/L | |
| Schizocytes | neg |

# Mm S-R

55 ans

Asthénie, consultation cardiologue, urgence

| S R | 19/09/2018 | 21/09/2018 |
|---|---|---|
| LEUCOCYTES | 6,09 | 7.03 |
| HEMOGLOBINE | 12.5 | 11.2 |
| reticulocytes | | 4,9% |
| NUM PLAQUETTES | 38 | 30 |
| CREATININE | 6 | 6 |
| LDH | 470 | 459 |
| HAPTOGLOBINE | <0,08 | <0.08 |
| PROTEINES URINE/L | | 0.25 |
| Schizocytes | neg | 2 à 3% |

# Mm S-R

55 ans

Asthénie, consultation cardiologue, urgence

| S R | 19/09/2018 | 21/09/2018 | 22/09/2018 | 23/09/2018 |
|---|---|---|---|---|
| LEUCOCYTES | 6,09 | 7.03 | 8.00 | 6.12 |
| HEMOGLOBINE | 12.5 | 11.2 | 12.1 | 10.0 |
| reticulocytes | | 4,9% | | |
| NUM PLAQUETTES | 38 | 30 | 25 | 44 |
| CREATININE | 6 | 6 | 7 | 6 |
| LDH | 470 | 459 | 507 | 217 |
| HAPTOGLOBINE | <0,08 | <0.08 | | 0.38 |
| PROTEINES URINE/L | | 0.25 | 0.46 | 0.28 |
| Schizocytes | neg | 2 à 3% | 2 à 3% | 2 à 3% |

Activité ADAMTS-13 <1%
Ac anti Adamts-13 60 ui

**TABLE I. Presence of Residual Schistocytosis Versus Early Relapse Rate***

| | Presence of residual schistocytosis | Absence of residual schistocytosis | Total |
|---|---|---|---|
| Relapse | 5 | 9 | 14 |
| No relapse | 11 | 20 | 31 |
| Total | 16 | 29 | 45 |

*Comparison of the number of patients with or without residual schistocytosis at the time of cessation of plasma exchange. Overall, residual schistocytosis was present in 35.6% of patients but was not a predictor for relapse ($P = 1.00$).

Egan, Journal of Clinical Apheresis, 2004

# Mr L-Jc

- Homme 70 ans, oppression thoracique

**Adamts-13<1%**
**Ac 13 ui/l**

| | 09/11/2014 |
|---|---|
| HEMOGLOBINE | 8,4 |
| NUM PLAQUETTES | 9 |
| CREATININE | 11 |
| LDH | 1414 |
| HAPTOGLOBINE | <0.008 |
| reticulocytes | 13% |
| coombs | neg |
| tropo | 200 ui |
| schizocyte | |
| Cs | |
| EP | |

PTT acquis avec atteinte cardiaque

# Mr L-Jc

- Homme 70 ans, oppression thoracique

**Adamts-13<1%**
**Ac 13 ui/l**

| | 09/11/2014 | 13/11/2014 | 17/11/2014 |
|---|---|---|---|
| HEMOGLOBINE | 8,4 | 8,5 | 8,6 |
| NUM PLAQUETTES | 9 | 13 | 14 |
| CREATININE | 11 | 8 | 8 |
| LDH | 1414 | 1200 | 1100 |
| HAPTOGLOBINE | <0.008 | | 0,09 |
| reticulocytes | 13% | | 8% |
| coombs | neg | | |
| tropo | 200 ui | | |
| schizocyte | | 3% | |

Cs

EP

RTX

PTT acquis avec atteinte cardiaque

# Mr L-Jc

- Homme 70 ans, oppression thoracique

**Adamts-13<1%**
**Ac 13 ui/l**

| | 09/11/2014 | 13/11/2014 | 17/11/2014 | 20/11/2014 |
|---|---|---|---|---|
| HEMOGLOBINE | 8,4 | 8,5 | 8,6 | 9 |
| NUM PLAQUETTES | 9 | 13 | 14 | 26 |
| CREATININE | 11 | 8 | 8 | |
| LDH | 1414 | 1200 | 1100 | 224 |
| HAPTOGLOBINE | <0.008 | | 0,09 | 0,42 |
| reticulocytes | 13% | | 8% | 6% |
| coombs | neg | | | |
| tropo | 200 ui | | | |
| schizocyte | | 3% | | 3 à 6% |


PTT acquis avec atteinte cardiaque

# Mr L-Jc

- Homme 70 ans, oppression thoracique

**Adamts-13<1%**
**Ac 13 ui/l**

| | 09/11/2014 | 13/11/2014 | 17/11/2014 | 20/11/2014 | 04/12/2014 | 14/12/2014 |
|---|---|---|---|---|---|---|
| HEMOGLOBINE | 8,4 | 8,5 | 8,6 | 9 | 8,2 | 8 |
| NUM PLAQUETTES | 9 | 13 | 14 | 26 | 16 | 35 |
| CREATININE | 11 | 8 | 8 | | | |
| LDH | 1414 | 1200 | 1100 | 224 | 225 | 350 |
| HAPTOGLOBINE | <0.008 | | 0,09 | 0,42 | | |
| reticulocytes | 13% | | 8% | 6% | 3% | 3% |
| coombs | neg | | | | | |
| tropo | 200 ui | | | | | |
| schizocyte | | 3% | | 3 à 6% | 1 à 2% | 1 à 2% |


PTT acquis avec atteinte cardiaque

# Mr L-Jc

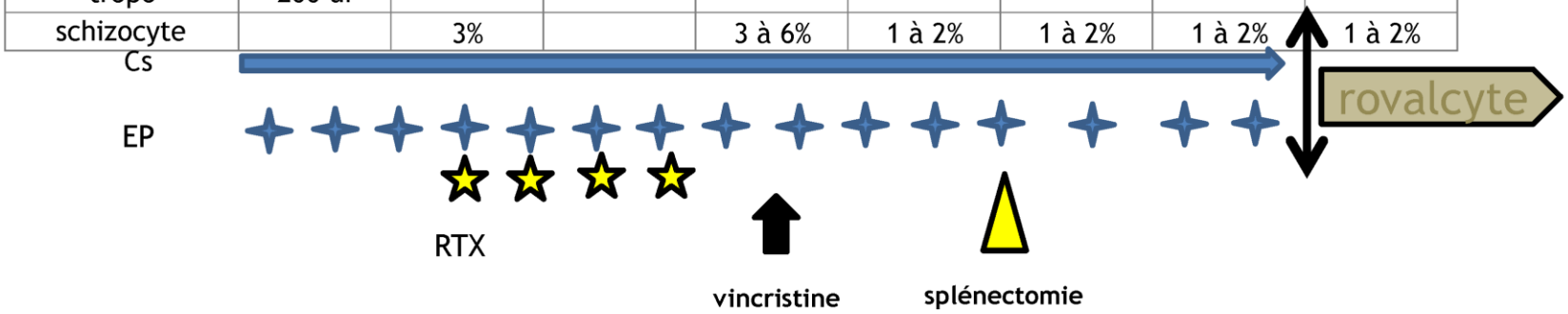
- Homme 70 ans, oppression thoracique

**Adamts-13<1%**
**Ac 13 ui/l**

**Activité 63%**
**Ac Adamts-13 3 ui**

PCR CMV = 6 log

| | 09/11/2014 | 13/11/2014 | 17/11/2014 | 20/11/2014 | 04/12/2014 | 14/12/2014 | 20/12/2015 | 29/12/2015 |
|---|---|---|---|---|---|---|---|---|
| HEMOGLOBINE | 8,4 | 8,5 | 8,6 | 9 | 8,2 | 8 | 7,6 | 9 |
| NUM PLAQUETTES | 9 | 13 | 14 | 26 | 16 | 35 | 46 | 136 |
| CREATININE | 11 | 8 | 8 | | | | | |
| LDH | 1414 | 1200 | 1100 | 224 | 225 | 350 | 400 | |
| HAPTOGLOBINE | <0.008 | | 0,09 | 0,42 | | | 1,2 | 1,25 |
| reticulocytes | 13% | | 8% | 6% | 3% | 3% | 3% | 3% |
| coombs | neg | | | | | | | |
| tropo | 200 ui | | | | | | | |
| schizocyte | | 3% | | 3 à 6% | 1 à 2% | 1 à 2% | 1 à 2% | 1 à 2% |




PTT acquis avec atteinte cardiaque

# En conclusion

- Les pièges de la schizocytoses sont :
  - Les erreurs d'analyse : Autres dysmorphies érythrocytaires
  - Les erreurs d'interprétation : assimilé *de facto* le schizocyte à  de la MAT.

- Importance de la qualité de l'analyse cytologique.

- L'ensemble des diagnostics différentiels évoqués ne doit pas induire de confusion qui ne se pose pas en pratique. **L'attention doit rester focalisé sur le SHU-PTT aux consequences graves.**

- Attention aux situations limites et à la tentation des therapies innovantes.

- Importance du contexte clinique. Ne pas oublier b12, medullogramme, CIVD, Coombs.

- Savoir remettre en cause un diagnostic.

Merci pour votre attention