

# First Seminar on Delayed Hemolytic Transfusion Reaction in Sickle Cell Disease Patients

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## Recurrent DHTR in a SCD child

Slimane Allali, hospital practitioner

Department of Pediatrics, Necker Hospital for Sick Children, Paris Descartes University, AP-HP,  
Paris, France



10-year-old girl

# Medical history

- Family
  - Unrelated parents originating from Gabon
  - 1 sister: homozygous SCD
- Patient
  - **Homozygous SCD** diagnosed at the age of two (Gabon)
  - G6PD: heterozygous for variant A-
  - **Basal hemoglobin: 7.5 g/dL** (6g/dL before splenectomy)
  - High frequency of VOC in early childhood
  - **Hydroxycarbamide** started in Gabon at the age of seven (23mg/kg/d)
  - Arrival in France at the age of nine for cardiac surgery (mitral valve prolapse)

# Medical history

- Transfusions
  - **Multiple RBC transfusions in Gabon for repeated splenic sequestrations**  
(details not available)
  - Arrival in France at the age of nine (January 2015)
  - Phenotype: D+C-E-c+e+K-Fya-Fyb-Jka+Jkb-M-N+S-s+Doa-Dob+VS+Jsa+Jsb+
  - **Polyalloimmunization** discovered at arrival in France: **anti-C, anti-S**
  - + **autoantibody** against an antigen of high prevalence (DAT: ++)
  - Mitral plasty, splenectomy and cholecystectomy (February 2015): **5 RBC units**  
(extended phenotype-matched and crossmatch-compatible)

# First episode

- June 2016 (10.5 yrs)
  - Hospitalization in another Paris region hospital for a severe VOC
  - **Hospital registration under an incorrect name due to misspelling**
  - **Negative antibody screen**
  - RBC transfusion for Hb 7.2 g/dL (no reticulocyte count) despite no sign of ACS
  - **06/19: 1 RBC unit** phenotypically matched for D, C/c, E/e and K

O+D-C-E-c+e+K-Jka+Jkb+Fya-Fyb+S+s-

 06/22: generalized pain, fever and **poor transfusion efficacy**

1 RBC unit  
S+



1 RBC unit  
phenotype-matched  
crossmatch-compatible

EPO

IVIg  
(1g/kg x2)



Rituximab  
(375 mg/m<sup>2</sup>)

EPO

O-D-C-E-c+e+K-Fya-Fyb+Jka+Jkb-M+S-s+



June 2016

July 2016

DAT: **negative**  
Elution: **anti-S**

DAT: **+++ (IgG)**  
Elution: **anti-S**

Antibody screen (CNRGS): **anti-C,**  
**anti-S, anti-M, anti-Fy3, anti-Jkb**

# First episode

- **Immunoematology testing**
  - DAT was initially negative but elution was positive for **anti-S**
  - Antibody screen (**CNRGS**) allowed the identification of three « new » alloantibodies: **anti-Fy3** (anti-public), **anti-Jkb** and **anti-M**
  - Antibody screen was **negative 1 year after DHTR**
  - ⇒ undetectable alloantibodies are still present but at infraserologic level
- **RBC Genotyping**
  - No partial antigen for Rh blood group system
- **Identity vigilance +++**


# Second episode

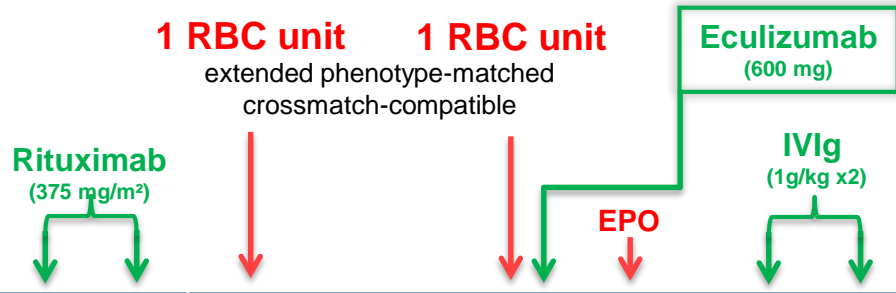
- **September 2018 (12.5 yrs)**
  - Painful limping without fever





# Second episode

- September 2018 (12.5 yrs)
    - Painful limping without fever
    - Diagnosis: osteonecrosis of the femoral heads
    - Initial management: traction
    - Decision of **bilateral proximal femoral osteotomy** (starting with the left hip)
  - Preparation for high bleeding risk surgery
    - **Rituximab**: 2 perfusions , 2 weeks and one week before surgery
    - Convocation of 4 blood donors by the EFS: collection of two RBC units
  - Surgery
    - Triple pelvic osteotomy (left hip)
    - **Transfusion** during surgery: 1 extended phenotype-matched and crossmatch compatible RBC unit: O-D-C-E-c+e+K-Fya-Fyb-Jka+Jkb-M-S-Doa-
-  **day 7: acute low back/chest pain, respiratory distress, macroscopic hemoglobinuria**



September 2018

O-D-C-E-c+e+K-Fya-Fyb-Jka+Jkb-M-S-Doa-

October 2018

↓  
DAT: **negative**  
Elution: **negative**

Antibody screen: **negative**

# Key messages

- Importance of **identity vigilance**
- Beware of **undetectable alloantibodies**: infra-serologic but very dangerous
- **Extended phenotype-matched** transfusion in case of DHTR
  - ⇒ RBC units that are matched for:
    - the concerned antigens
    - D, C/c, E/e and K
    - Fya, Fyb, Jka, Jkb, M, S and s
- **Limitation of transfusions**:
  - 2 avoidable transfusions in 2016
  - Femoral osteotomy if history of DHTR ?
- Inefficacy of **Rituximab** in preventing DHTR for this patient
- Efficacy of **Eculizumab** in treating DHTR