

Should we Go With The Flow



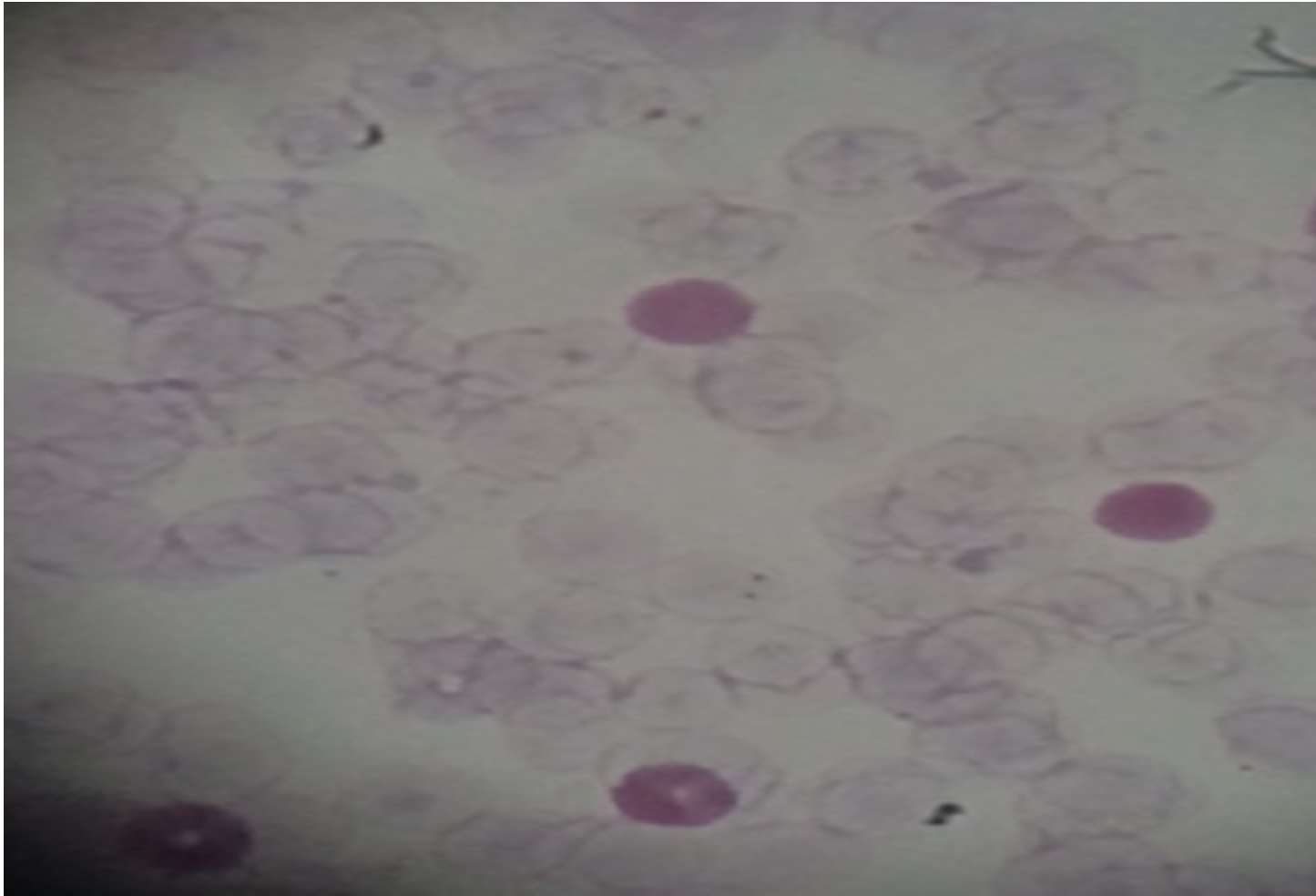
Fetomaternal Haemorrhage

- Kleihauer-Betke test used world wide as an inexpensive, simple & rapid method to determine FMH
 - In Rh(D) Negative women post partum
 - In both Rh(D) Negative & Positive women antepartum in cases of trauma or APH
- Suggested that Flow Cytometry more accurate as Kleihauer has a tendency to over estimate.

Kleihauer Principle

- Fetal & maternal cells differentiated by acid elution & counter stained with eosin
- Counted using under microscope using a Miller ocular
- Fetal Haemoglobin (HbF) – more resistant to denaturisation than adult haemoglobin (HbA)

Kleihauer Slide



Problems

- If mother has high level of HbF due to thalassaemia, sickle cell or hereditary persistence of fetal haemoglobin (HPFH) – intermediate staining cells
- Meticulous attention to performance & interpretation of test – otherwise accuracy is not guaranteed
- Manual test – variability in staining technique & counting

Our Procedure

- Perform a Kleihauer as quick results in case of antepartum event
- If a large bleed detected (> 3 ml) allocate RhIg (if Rh Neg mother) on the results of the Kleihauer but send the sample for Flow Cytometry
- If the mother has Thalassaemia or high HbF levels the Kleihauer is not valid

Flow Cytometry

- 2 antibodies:
 - One directed against fetal Haemoglobin (HbF)
 - The other directed against Carbonic Anhydrase (CA), an enzyme only present in adult RBCs & very late stage fetal cells

Case Study

- 35 yo G2P1, Rh Negative – low speed MVA at 33/40 on 7/08/18
- Presented to GP with lower abdo pain
- Kleihauer requested – positive, sent for Flow Cytometry (FC)
- Rh(D) immunoglobulin issued – 2 x 625 IU
- Follow up 48 hrs later – Klei & antibody screen
- Mother on Thyroxine, anticoagulant, steroids

Timeline

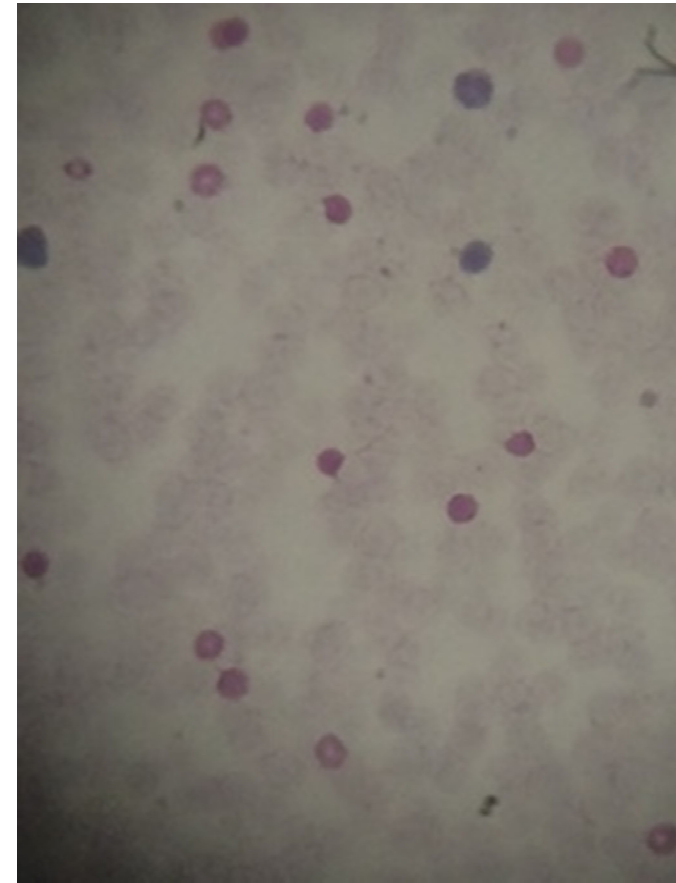
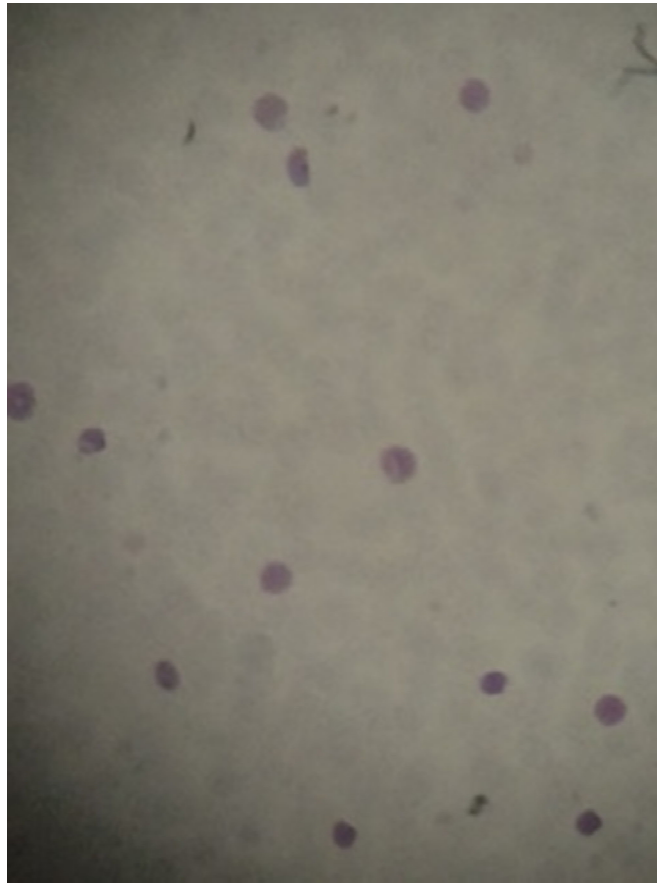
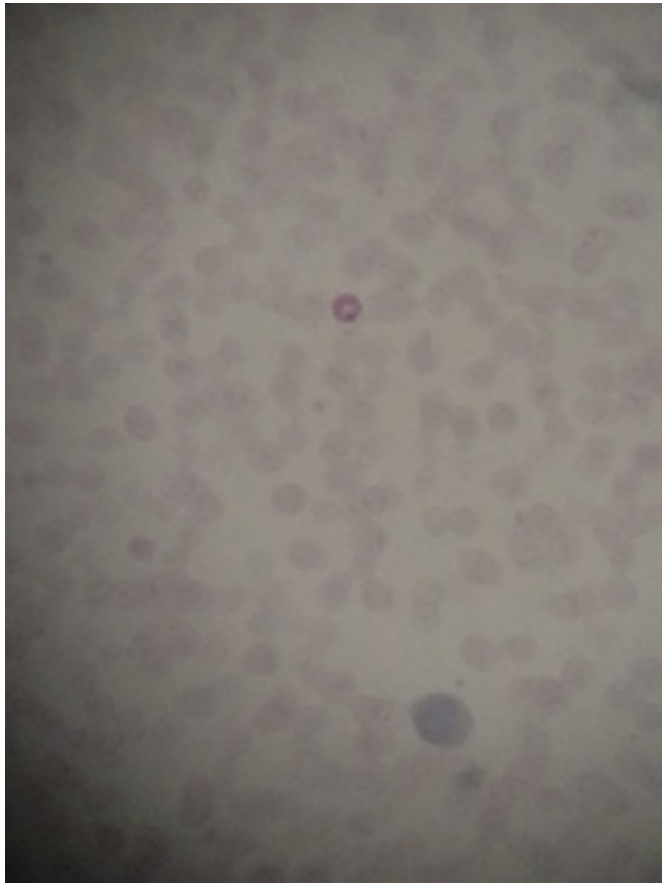
DATE	ABSCREEN	KLEI	FLOW	Rhlg
6/07/18	Neg			1 x 625 IU *
7/08/18		6.72 ml	10.32 ml	
8/08/18	Anti-D	7.92 ml		2 x 625 IU
10/08/18	Anti-D	24.24 ml	?sample integrity	4 x 625 IU
12/08/18	Anti-D	18.48 ml	?sample integrity	5 x 625 IU
17/08/18	Anti-D	40.8 ml	55.0 ml **	
18/08/18				3 x 1500IU
19/08/18				1 x 1500 IU
21/08/18	Anti-D + Anti-C	32.9 ml	76.86 ml	5 x 1500 IU

- 28/40 prophylaxis
- ** Austin 34.3 ml

7/08/18

12/08/18

17/08/18



- Despite consistently high results from both Kleihauer & FC – no signs of fetal distress
- Haem Reg consulted with both patient & treating obstetric team
- Almost 3/52 post MVA caesarean performed at 36/40
- Male baby 2550g delivered with good APGARS
- Hypoglycemic but no other issues. No FBE taken.

Questions

- Why were the results increasing – was the baby Rh(D) Negative or was it continuing to bleed.
- Why were the FC & Kleihauer results so discrepant
- If the last FC was correct would the baby not be in some distress
- CTG Tracing on 7th, 10th, 12th, 17th, 18th & 23rd Aug