

COL4A1 mutation
The new kid on the block

H.Griffiths, D.Das. Princess Alexandra Hospital NHS Trust, Hamstel Road, Harlow, CM20 1QX

NHS
The Princess Alexandra Hospital
NHS Trust

Introduction

- The COL4A1 mutation first reported in 2005 is located on chromosome 13 and encodes for the alpha-1 chain of type IV collagen.[1]
- Defects in this gene cause weakness in the vascular basement membrane which can result in lacunar stroke and cerebral haemorrhage.[2]
- We report the case of a parturient with a COL4A1 mutation that underwent a subarachnoid block (SAB) for a caesarean section (CS).

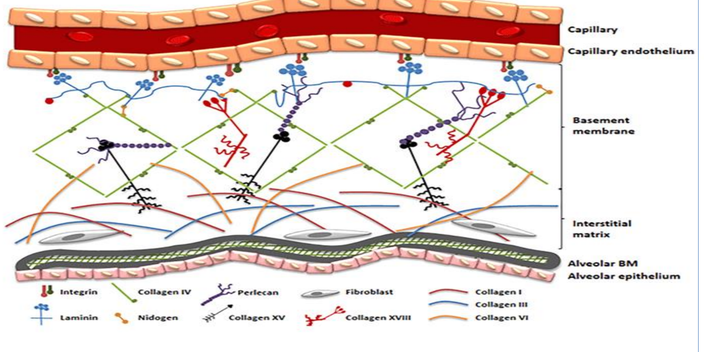
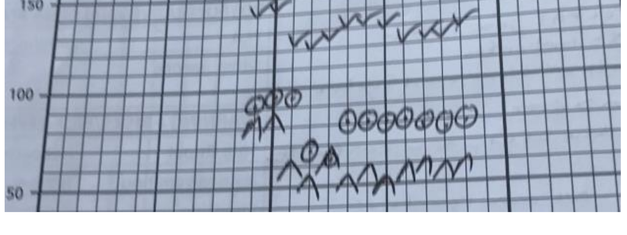


Figure 1. *(Image has permissions for reprint as per their terms and conditions)* [3]
Type IV collagen represented by the green lines in the above diagram is critical in stabilising the basement membrane.

Case report

- 30-year-old G2P1 with a somatic mosaic for COL4A1 mutation required an emergency CS due to a fast advancing labour.
- The patient was seen in the obstetric antenatal clinic and advised against labouring due to the associated haemodynamic changes and increased risk of intracerebral bleeding.
- Obstetric history included a CS over ten years ago under a neuroaxial block. Her COL4A1 mutation was not known at that time and was only investigated due to congenital defects noted in her first child.
- Our patient was unique in that she was the first person ever to be identified as having a somatic mosaicism for the mutation and at the time of presentation showed no overt symptoms.
- A SAB with a 25G spinal needle was inserted at the L4/5 interspace on first attempt. 12.5mg of heavy marcaine and 400mcg diamorphine gave a cold sensory block to T3.
- Her blood pressure was titrated using a phenylephrine infusion with her systolic readings staying between 120 and 140mmHg throughout (see observation chart below). There was minimal blood loss and the patient made an uneventful recovery.



Discussion

- The major concern in this disorder is the fragility of the vascular basement membrane resulting in intracerebral bleeding, thus the primary anaesthetic target should be prevention of hypertension.
- It was our view that a SAB would offer the safest haemodynamic control balanced against the unknown risk of neuroaxial haematoma in this condition.
- The COL4A1 mutation is a relatively new discovery with limited case reports and none to our knowledge being published in reference to the obstetric population.
- Our patient, although the first to be identified with a somatic mosaicism, will not be the last as more women of child bearing age will be picked up incidentally through genetic screening.
- Our case report highlights that a SAB can be carried out safely in this condition when careful attention is paid to ensuring haemodynamic stability.

References

1. Gould DB, Phalan FC, Breedveld GJ et al. Mutations in Col4a1 cause perinatal cerebral haemorrhage and porencephaly. Science. 2005; 20:308(5725):1167-1171
2. Lanfranconi S, Markus HS. COL4A1 mutations as a Monogenic Cause of Cerebral Small Vessel Disease A Systematic Review. Stroke. 2010; 41:513-518
3. Kjeld NG, Hua B, Karsdal et al. The endothelial specific isoform of type XVIII collagen correlates to annual bleeding rate in haemophilia patients. PLoS ONE 2018: 13(1)