

From "Confined Placental" to "Confined Chorionic" Mosaicism: protecting normal fetuses from iatrogenic misdiagnosis at amniocentesis (EP10.57)

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Objective

Kalousek (1987) originally termed mosaicism confined to trophoblast-derived tissues "**Confined Chorionic Mosaicism (CCM)**". The shift to "Confined Placental Mosaicism" (CPM) caused the chorion membrane to fade from clinical awareness. We propose returning to CCM, because every amniocentesis must traverse the trophoblast-derived chorion, risking contamination when mosaicism is present.

The forgotten anatomy

Trophoblast → placenta + **chorion membrane** — susceptible to confined mosaicism

Inner cell mass → fetus, amniotic fluid, cord blood, buccal mucosa — not susceptible

Avoiding the placenta does NOT avoid the chorion.

Methods

Three pregnancies referred after amniocentesis-detected mosaicism following positive or no-call NIPT underwent detailed neurosonography, showing **no abnormalities**. In Case 1, cord blood and placenta were unavailable. In Cases 2 and 3, postnatal FISH of placenta (four quadrants), chorion, umbilical cord and cord blood was performed. In all three cases, postnatal peripheral blood and **buccal mucosa** were analysed.

Conclusion

None of these women would have undergone amniocentesis without NIPT. The NIPT era has created a new iatrogenic pathway: NIPT detects trophoblast-derived mosaicism, **amniocentesis traverses the same trophoblast-derived chorion**, and normal fetuses are misdiagnosed. Returning to "Confined Chorionic Mosaicism" restores awareness of this risk. Discarding the initial 0.5–1.0 mL aspirate and detaching the syringe before withdrawing the needle can prevent this misdiagnosis.

Results

Case 1 — trisomy 13

NIPT T13-positive. Amniocentesis 15w (transplacental, multiple insertions): Level IIIa T13 mosaic. Re-amniocentesis 19w: QF-PCR / G-band negative, FISH 3%.

Case 2 — trisomy 21

Repeated no-call NIPT (×2). Amniocentesis 17w: FISH 4% / G-band 15% T21.

Case 3 — trisomy 13

NIPT T13-positive. Amniocentesis 15w: QF-PCR (uncultured) negative but G-band (cultured) 22% T13 — **this discordance suggested contaminating cells proliferating in culture**. Re-amniocentesis 20w: FISH 11.3% / G-band 4%.

All three infants were phenotypically normal. Postnatal peripheral blood and buccal mucosa showed 0% trisomic cells in every case.

Postnatal FISH: % trisomic cells

Tissue	Origin	Case 1 (T13)	Case 2 (T21)	Case 3 (T13)
Placenta (A–D)	Trophoblast	n.a.	4–18%	80–94%
Chorion membrane	Trophoblast	n.a.	18%	3%
Umbilical cord	ExE mesoderm	n.a.	2%	14%
Cord blood	Inner cell mass	n.a.	0%	0%
Peripheral blood	Inner cell mass	0%	0%	0%
Buccal mucosa	Inner cell mass	0%	0%	0%

n.a. = tissue not available. Trisomic cells were confined to trophoblast-derived tissues; every inner-cell-mass-derived tissue, including buccal mucosa, was normal.

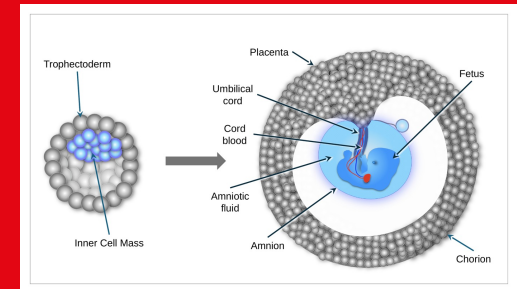
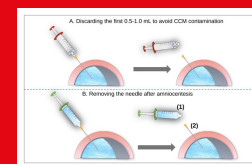


Figure 1. Trophoblast gives rise to placenta and chorion; the inner cell mass gives rise to fetus, amniotic fluid, cord blood and buccal mucosa.

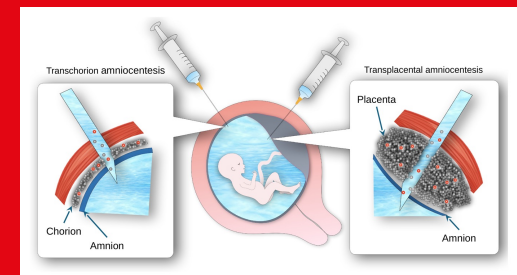


Figure 2. Both transchorion and transplacental amniocentesis traverse the CCM-affected chorion membrane.

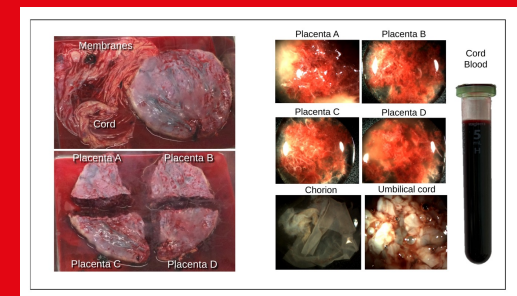


Figure 3. Case 2 (T21): postnatal placenta, membranes, umbilical cord and cord blood sampled for FISH.