

# ID:4555- Umbilical Cord Cannulation Techniques in a Sheep Model of Artificial Placenta: A Comparative Study

Sanin-Ramirez D, Illa M, Moran M, Aghajani F, Hawkins-Villareal A, Rezaei K, Bobillo-Perez S, Randanne Paula C, Velilla M, Del Rio R, Narvaez V, Chorda M, Fucho R, De Roo-Puente Y, Crispi F, Bonet-Carne E, Gratacos E, Eixarch E

BCNatal | Fetal Medicine Research Center (Hospital Clínic and Hospital Sant Joan de Déu), University of Barcelona, Barcelona, Spain.


## Aim

To evaluate the benefits and drawbacks of different umbilical cord cannulation techniques in fetal lambs transferred and to an experimental artificial placenta (AP) system.

## Methods

- 44 fetal lambs (95-128 days) transferred to an AP system with pumpless extracorporeal circuit with low resistance oxygenator
- Umbilical cord cannulation of two arteries and one vein using three different techniques:
  - Direct cut-down (DCD) (n=8)
  - Lateral-sequential section with mild vasospasm prevention (LSS-M) (n=6)
  - Lateral-sequential section with extensive vasospasm prevention (LSS-E) (n=30)
- Surgical complications, acid base status, hemoglobine, hemodynamic adaptation and survival were compared among groups.

## Funding

 "la Caixa" Foundation



## Results

Variables	DCD(n=8)	LSS-M (n=6)	LSS-E (n=30)	P-Value
Male/Female	3/4	2/4	12/18	n.s.
GA (days)	115 (112.25, 115.75)	114 (113, 117.5)	109.5 (109, 110.25)	0.019
Weight (g)	1,795 ± 244	2,203 ± 385	1,637 ± 579	n.s.
Complications	8 (100)	6 (100)	14 (46.7)	0.002
- Decannulation	3 (37.5)	1 (16.7)	1 (3.3)	0.026
- Bubbles in the circuit	2 (25)	1 (16.7)	5 (16.7)	n.s.
- Vasospasm	2 (25)	4 (66.7)	2 (6.7)	0.004
- Bleeding	2 (25)	2 (33.3)	10 (33.3)	n.s.
- Vascular injury	2 (25)	1 (16.7)	1 (3.3)	n.s.
Occlusion time (sec)	246.9 ± 137.5	230.3 ± 119.7	313.6 ± 132.9	n.s.
Total cannulation (sec)	258 (196.5, 378.75)	533 (405, 705.25)	381 (344, 523.5)	n.s.
pH post-cannulation	7.12 (7.01, 7.39)	7.35 (7.25, 7.41)	7.35 (7.29, 7.42)	n.s.
Lactate (mmol/L)	7.3 ± 3.8	5.6 ± 2.5	5.2 ± 1.9	n.s.
Hb post-cannulation (g/dL)	8.1 ± 3.4	7.9 ± 0.8	7.9 ± 1.7	n.s.
Heart rate-mean (bpm)	30 (0, 95.5)	208 (186, 211.5)	177 (168, 187.25)	0.001
Circuit flow-mean (ml/kg/min)	23.0 ± 39.8	82.3 ± 50.2	153.4 ± 27.6	<0.001
Time in AP (hours)	0.2 (0.15, 0.38)	3.6 (2.33, 6.37)	50.9 (25.44, 96.68)	<0.001

**Conclusions:** DCD technique was associated with higher complication rates and short survival period in fetuses transferred to AP system. LSS-E group had a lower complication rate and better results in terms of flow, heart rate and survival.