

Porcine circovirus 3 (PCV-3) associated disease in an Iberian farm in Spain

A. Cobos^{1,2,3,4}, M. Sibila^{1,3,4}, E. Huerta^{1,3,4}, M. Pérez^{1,3,4}, M. Marcos⁵, R. Menjón⁵, M. Jiménez⁵, L. Gálvez⁶, J. Segales^{1,2,3}

¹ Unitat Mixta d'Investigació IRTA-UAB en Sanitat Animal, Centre de Recerca en Sanitat Animal (CRESA), Campus de la Universitat Autònoma de Barcelona (UAB), Bellaterra, 08193 Barcelona, Spain. ² Departament de Sanitat i Anatomia Animals, Facultat de Veterinària, Campus de la Universitat Autònoma de Barcelona (UAB), Bellaterra, 08193 Barcelona, Spain. ³ WOAHA Collaborating Centre for the Research and Control of Emerging and Re-Emerging Swine Diseases in Europe (IRTA-CReSA), Bellaterra, Barcelona, Spain. ⁴ IRTA Programa de Sanitat Animal, Centre de Recerca en Sanitat Animal (CRESA), Campus de la Universitat Autònoma de Barcelona (UAB), Bellaterra, 08193 Barcelona, Spain. ⁵ MSD Animal Health, Spain ⁶ Veterinary clinician, Spain

Background

Porcine circovirus 3 (PCV-3) has been associated to reproductive (PCV-3-RD) and post-natal diseases. However, their diagnosis is largely limited and their real prevalence and impact on swine production are unknown. PCV-3-RD has been reported in intensively reared pigs, but not yet in extensive production systems.

Therefore, the aim of this study was to characterize a case of PCV-3-RD in an Iberian semi-outdoors sow farm.

Clinical Case Description

- Farrow-to-nursery farm
- 420 Iberian sows (self-replacement)
- 3-week batch (60 sows per batch)
- PRRSV-free

Reproductive problem affecting mainly gilts

- ↓ Numbers of piglets per litter
- ↑ In stillborn and mummified fetuses
- ↑ In return-to-estrus and mummified fetuses
- ↑ In weak born piglets that become poor-doers



Diagnostic

- Litter 1 | Fetus 1: Weak born
Fetus 2: Stillborn →
- Litter 2 | Fetus 3: Weak born →
Fetus 4: Mummified
Fetus 5: Mummified



- Gross examination
- Complete histopathological evaluation
- Immunohistochemistry (IHC) against PCV-2 and PRRSV
- In situ hybridization (ISH) against PCV-3
- qPCR against PCV-3 in tissue pools

Results

Table 1. Summary of diagnostic investigation results

Piglet	Gross lesions	Histological lesions	PCV-3 genome copies/ mL	PCV-3 ISH	PCV-2 IHC	PRRSV IHC
1	-	Systemic periarter	10 ⁹	+++	-	-
2	+	Systemic periarteritis and nonsuppurative endocarditis and myocarditis	10 ⁹	+++	-	-
3	-	Mesenteric periarteritis	10 ⁴	+	-	-
4	-	-	10 ⁴	-	-	-
5	-	-	10 ⁴	-	-	-

Results

Table 1. Summary of diagnostic investigation results

Piglet	Gross lesions	Histological lesions	PCV-3 genome copies/ mL	PCV-3 ISH	PCV-2 IHC	PRRSV IHC
1	-	Systemic periarter	10 ⁹	+++	-	-
2	+	Systemic periarteritis and nonsuppurative endocarditis and myocarditis	10 ⁹	+++	-	-
3	-	Mesenteric periarteritis	10 ⁴	+	-	-
4	-	-	10 ⁴	-	-	-
5	-	-	10 ⁴	-	-	-

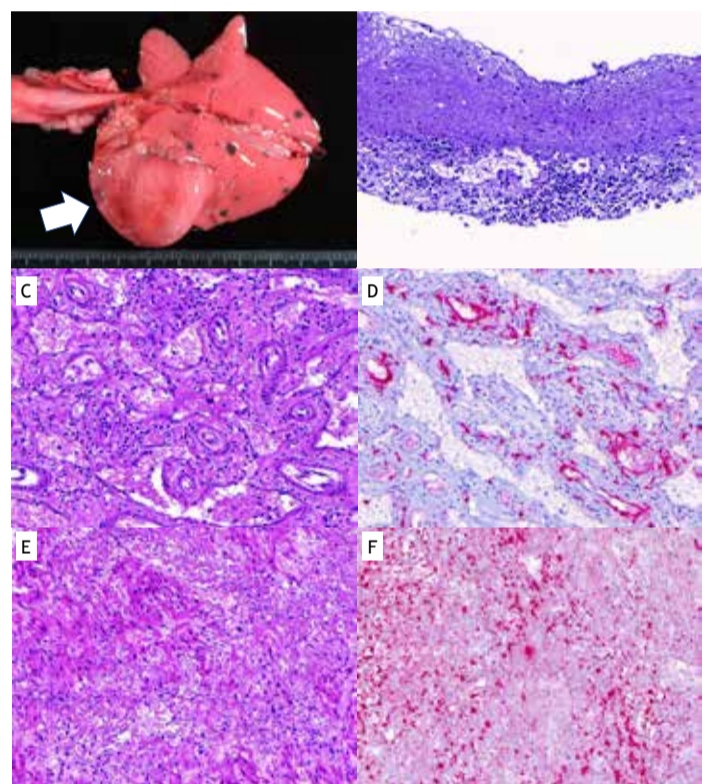


Figure 3. Gross and histopathological lesions of piglet 2: Cardiomegaly with multifocal reddish areas (A), non-suppurative endocarditis (B), mesenteric periarteritis (C) and positive PCV-3 ISH (D), non-suppurative myocarditis (E) and positive PCV-3 ISH (F).

Conclusion

- PCV-3-RD was diagnosed by means of clinical signs, characteristic histopathological lesions (systemic periarteritis and non-suppurative myocarditis) and high viral loads within them.
- This is the first case reporting PCV-3-RD in Iberian semi-outdoor reared sows, mainly affecting gilts. Although rarely considered, PCV-3 can cause disease in extensive productive systems.