

# THE INCIDENCE OF EXTERNAL AND VISCERAL CONGENITAL MALFORMATIONS AND VARIATIONS IN GÖTTINGEN MINIPIGS

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**Introduction:** Early onset of sexual maturity compared to other large animal species, duration of gestation and litter size as well as the susceptibility of the Minipig to known human teratogens [1,2] make the Minipig the logical economical and scientific alternative to other species for developmental and reproductive toxicology studies. Knowledge of the incidence of spontaneous congenital abnormalities in the Minipig is critical for the accurate interpretation of findings in teratogenicity studies.



Fig. 1. Cleft lip and Jaw.

**Materials and Methods:** During a 2-year period, 16,898 Minipigs were born at Ellegaard Göttingen Minipigs A/S. External and visceral examinations were performed at external laboratories on 1,739 piglets that were stillborn, found dead or euthanized within 72 hours after birth.



Fig. 2. Pentadactyly.

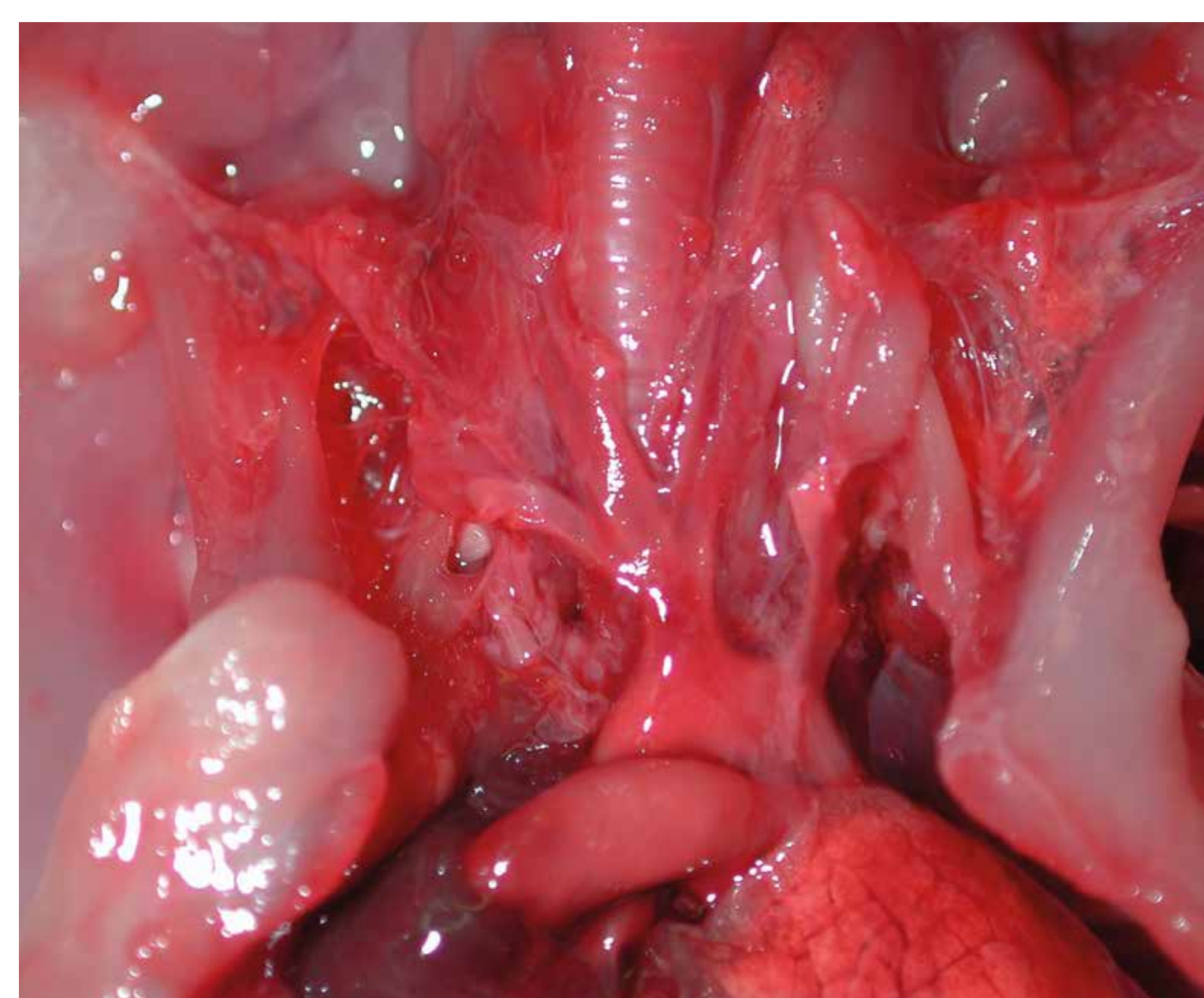


Fig. 3. Absent truncus bicaroticus.

**Results:** 869 of the 1,739 examined piglets showed at least one malformation or variation, which constituted 5.14% [3] of the total number of piglets born. The incidence of external and visceral malformations was less than 0.2 and 0.1% respectively.

**Table 1:** Most common external findings.

Finding	M	n	% Incidence of total no. of piglets		
			Total	Male	Female
Domed head	M	40	0.237	0.304	0.168
Short snout	M	29	0.172	0.234	0.108
Cleft lip	M	20	0.118	0.14	0.096
Cleft palate	M	34	0.201	0.245	0.156
Scoliosis	M	35	0.207	0.199	0.216
Limb hyperextension	M	19	0.112	0.105	0.120
Limb hyperflexion	M	46	0.272	0.327	0.216
Hyperflexion carpus/tarsus	M	21	0.124	0.105	0.144
Polydactyly	V*	122	0.722	0.794	0.648
Syndactyly	M	47	0.278	0.304	0.252

M=Malformation; V=variation. \*Protuberance of digit I (dew claw).

**Table 2:** Most common visceral findings.

Finding	M	n	% Incidence of total no. of piglets		
			Total	Male	Female
Diaphragmatic hernia	M	58	0.343	0.455	0.228
Atrium septum defect	M	32	0.189	0.210	0.168
Ventricular septum defect	M	100	0.592	0.701	0.480
Dilated pulmonary trunk	M	12	0.071	0.082	0.060
Absent truncus bicaroticus	V	156	0.923	1.179	0.660
Long truncus bicaroticus	V	19	0.112	0.117	0.108
Short truncus bicaroticus	V	109	0.645	0.794	0.492
Undescended testes	M	191	NA	2.230	NA
Small gallbladder	V	16	0.095	0.128	0.060
Large kidney	V	16	0.095	0.117	0.072

**Conclusion:** Present data in conjunction with other studies in the Göttingen Minipig [4,5], add substantial background data on the incidence of spontaneous congenital abnormalities and provides context to the aetiology of morphological changes to support evaluation of study-to-study variability of low incidence findings.

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