ABSTRACTS

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**XX/XY chimaerism/mosaicism in a phenotypically female Wirehaired Pointing Griffon dog**

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**CLINICAL CASE:** A three years old Wirehaired Pointing Griffon dog was presented for investigation because of primary anestrus. The dog was phenotypically female, with normal physical development and behavior. No information was available about exogenous hormonal administration or about the occurrence of sexual abnormalities in siblings. External genital tract inspection revealed a juvenile vulva and a slightly enlarged clitoris not protruding from vulvar labia. Digital inspection of the vagina was not possible because of its narrow diameter. Ultrasonographic examination showed a very thin, poorly developed and barely identifiable uterus-like structure and two small gonads located caudally to the kidneys. Gonads were characterized by a homogeneous parenchyma, without evidence of ovarian structures. For the karyotype analysis metaphases were produced following the standard method for fresh lymphocytes culture (1). Results show the absence of Robertsonian translocation as well as coarse reciprocal translocation. On the other hand a chimaeric/mosaic constitution XX/XY was present in blood. The analyses of more than 55 metaphases revealed that the proportion of the two cell populations was: 70% XX and 30% XY. Gonadectomy was recommended for the increased risk of neoplastic degeneration of the gonads if represented by testes located intra-abdominally. Before surgery, endoscopic examination of the vagina was performed under general anesthesia. A narrow, smooth and pale cavitary organ, characterized by the lack of the typical vaginal folds was observed. The dorsal median fold was visible only in the caudal tract and the vagina ended cranially in a blind sac without a structure referable to the cervix. Through laparotomy, the gonads appeared as small ovoid organs, with smooth and pale surface and a well-developed vascular structure. The gonads were caudally connected to a tubular structure, of about 2-3 mm in diameter, directed to the inner inguinal ring. Gonadectomy and excision of the tubular structure were performed and the tissues were processed for histopathological analysis. Surgical layers were sutured routinely. Postoperative recovery was uneventful and the dog was discharged with a prescription of antibiotics and analgesics. Skin suture was removed ten days later. Histology showed that gonads were assumable as immature testis, being composed by a fibro-vascular stroma where few and scattered seminal tubules, lined by Sertoli cells, and intermixed with group of Leydig cells were clearly recognizable. Seminal cells were absent in seminal tubules and in the epididymides. Connected with each gonad, a fibro-muscular solid cord was present. In these structures, compatible with gubernacula testes, several closely packed large vessels were also observed.

**DISCUSSION.** XX/XY chimaerism is a sex chromosome disorder caused by fusion of different zygotes or cells originating from different zygotes, whereas XX/XY mosaicism results from non-disjunction in a single zygote or cells deriving from a single zygote (2, 3). In XX/XY chimaera or mosaic, testes, ovaries or ovotestis, associated with the development of mesonephric or paramesonephric duct derivates and ambiguous external genitalia are generally observed (2, 3). In dogs evident ambiguous genitalia, i.e. cranially displaced vulva or hypoplastic penis, have been reported (for review 3). However, in the case presented here, only a mild abnormality of external genitalia (slightly enlarged clitoris) was present and it could be unnoticed at the physical examination. Only clinical, histopathological and cytogenetic examinations allowed the achievement of a definitive diagnosis.

In agreement with the new nomenclature and reclassification of disorders of sex development in dogs proposed by Poth and coworkers (3), the present case can be classified as a 78,XX/78,XY testicular chimaera/mosaic. Unfortunately, sporadic reports do not clarify the real occurrence and frequency of various intersex conditions in dogs. An international database should be established to have a reliable survey of sex development disorders in this species.