FEMALE PSEUDOHERMAPHRODITISM IN A PUG DOG – DIAGNOSIS AND SURGICAL MANAGEMENT

Anil S. Patil
Associate Professor, Department of Veterinary Science, U.A.S. and I/C University Veterinary Hospital, University of Agricultural Sciences, Dharwad – 580 005, Karnataka.
[Received: 12.01.2021; Accepted: 20.11.2021]
{DOI 10.29005/IJCP.2021.13.2.74-76}

Congenital urogenital anomalies are well recognized but infrequent finding in dogs. A three year old female pug dog was presented with history of having discomfort in sitting position and enlarged clitoris visible externally as reddish penis like structure protruding from vulva. Gross examination of protruding clitoris revealed it was supported by palpable Os clitoridis suggestive of female pseudohermaphroditism. The urethral orifice was located cranially to the base of clitoris. Plain radiograph revealed presence of bony structure Os clitoridis in vulvular region. Structure was excised surgically under general anaesthesia. Satisfactory healing was observed post-operatively. Ovariohysterectomy was performed two months later.
Keywords: Dog; Pseudohermaphrodite; Clitoris; Os clitoridis.

Alterations in the normal differentiation patterns of gonads, genital duct and/or external genitalia often results in intersexuality. Intersex animals are usually considered hermaphrodites with genital organs showing features of both male and female sexes. These developmental disorders are caused by abnormalities of genetic or chromosomal origin, or inappropriate hormonal or chemical exposure (Passello-Legrand and Mowat, 2004). Pseudohermaphroditism is a disorder of phenotypical sex development in which chromosomal and gonadal gender match, but the external genitalia have characteristics of the opposite gender and these animals are often sterile (Poth, *et al.*, 2010). Pseudohermaphrodites are of two categories, male and female. Male pseudohermaphrodites (MPH) have XY chromosomes and testicles but the genitals appear feminine. Female pseudohermaphrodites (FPH) have XX chromosomes and ovaries but exhibit varying degrees of male genitalia. Usually, FPH occur when testosterone-type medications are given to the mother during pregnancy during critical stages of fetal development, inducing virilization of female fetuses (Medleau *et al*., 1983). Limited cases of FPH have been previously reported in dogs that were managed surgically (Tarunbir Singh *et al*., 2019).

This report describes a case of FPH in a pug dog diagnosed using physical, and radiological examinations and its surgical management.

Case History and Observations

A three year old female pug dog was presented with history of not exhibiting heat cycles, having discomfort in sitting position and often sits with tilted position. There was also complaint of a finger-like structure protruding from the vulva. The growth had slowly progressed in size and became visible in last one year. Clinical examination revealed vulva was a bit ventrally placed in the perineal region, a large penis-like reddish structure “clitoris” supported by a palpable bony structure “os clitoridis” protruding from the vulva (Fig. 1). The urethral orifice was located cranially to the base of os-clitoridis. The dog was masculine. Plain radiography confirmed the presence of a boney structure i.e. Os clitoridis (Fig. 2). Both gross examination of dog and radiography of pelvis suggested Female pseudohermaphroditism i.e. a disorder of sexual development.


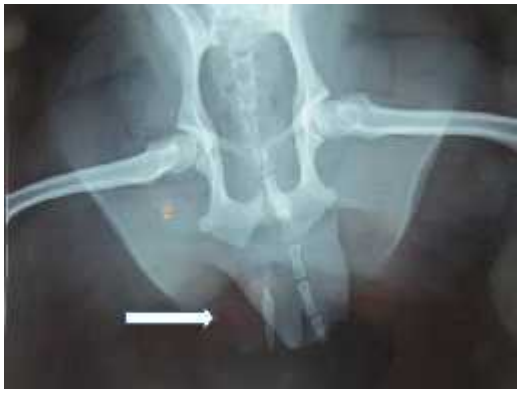

Fig. 1: A 3-year old female pseudohermaphrodite pug dog with a large clitoris protruded from Downwardly placed enlarged vulva.

Fig. 2: Ventro – Dorsal radiograph of a 3-year old female pseudohermaphrodite pug dog demonstrating the os-clitoridis at the perineal (vulval) region.

Surgical Treatment

Dog was operated under under Xylazine sedation and Propofol - Ketamine cocktail anaesthesia, positioned in dorsal recumbancy. The clitoris was pulled out from the vulva and elliptical incision was made at its attachment to the ventral aspect of the vulva and careful blunt dissection was made (Fig. 3). Haemostasis was performed using mosquito hemostats and blood vessels supplying the structure were ligated with chromic catgut 1-0. The enlarged clitoris was ablated surgically (Fig. 4). Vaginal mucous membrane defect was repaired using simple interrupted pattern sutures using catgut chromic 1-0. Urethral catheter was placed to maintain urination and to prevent the surgical site from contamination. Post-operatively the animal was administered broad spectrum antibiotic (Cefotaxime Sodium and Tazobactum, @ 20 mg/ kg b. wt. and non steroidal anti-inflammatory drug Meloxicam, @ 0.2 mg/kg b. wt. for five days. Owner was counseled not use animal for breeding. Ovariohysterectomy was performed two months after the first surgery.

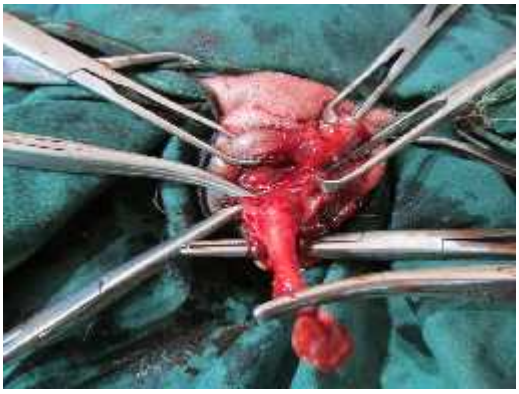


Fig. 3: Surgical removal of clitoris and Os clitoridis. Fig. 4: Surgically resected Os clitoridis

Results and Discussion

Pseudohermaphrodite occurs where there is a disagreement between phenotypic and gonadal sex and have mismatching external genitalia. Individuals with pseudohermaphroditism usually have a single type of germinal tissue, according to which they are male or female pseudohermaphrodite. These animals are often sterile, but should not be bred even if fertile as also reported by Del Amo *et al*., 2001. A FPH has ovaries but varying degree of male external genitalia. A penis can be present or, more often; it is an enlarged clitoris as also mentioned by Villagomez *et al*., 2009. The presence of partially developed internal male system in the form of male gubernaculum cannot be a result of

androgen/testosterone stimulation from interstitial cells of testicular tissue, as the male system would have been then fully developed. Sources of fetal androgenization may be due to exogenous exposure to androgens or due to adrenal hyperplasia in mother as also explained by Waghmare *et al*. 2010. It is therefore, hypothesized that stimulation from an alternative (non-testicular) androgen source occurred, in amount sufficient for partial but not full development of the male reproductive system as also mentioned by Meyers-Wallen *et al*., 1991.

Surgical resection is the best treatment of the above mentioned condition for both cosmetic and curative purpose. The position of the urethra and the course of the external urethral orifice were very crucial in the design and decision of the corrective surgery of the presented case of FPH. Here the urethra was normal and located on the floor of the vagina but it was away from the enlarged protruded clitoris. So, the excision of clitoris with its entire os-clitoridis was performed safely. However, any other related or unrelated genetic defect should also be ruled out. Ovariohysterectomy was a part of surgical management of FPH to reduce the risk of serious ovarian or uterine diseases, to avoid genetic progression of the defects to future generations, as well as allowing accurate classification of the type of hermaphroditism. During ovariohysterectomy in the present case, a fully developed female reproductive (Müllerian) system was present and the testicular tissue was absent, external genitalia had enlarged clitoris supported by bony structure (os clitoridis) and vulval inflammation. So, the present case was classified as Female pseudohermaphroditism because of the presence of ovaries and ambi-guity of external genitalia.

References

Del Amo, A. N., Luca, J. D., Zufriategui, L., Armocida, A., Barbeito, C. G. and Gobello, C. (2001). Male pseudo hermaphroditism in a dog - A case report. *Communications in Theriogenol*., **1**: 1-11.

Medleau, L., Johnson, C.A., Perry, R.L. and Dulisch, M.L. (1983). Female pseudohermaphroditism associated with mibolerone administration in a dog. *J. Am. Anim. Hosp. Assoc*., **19**: 213–215.

Meyers-Wallen, V.N., Manganaro, T.F., Kuroda, T., Concannon, P.W., MacLaughlin, D.T. and Donahoe, P.K. (1991). The critical period for mullerian duct regression in the dog embryo. *Biol. Reprod*., **45**: 626-633.

Passello-Legrand, F. and Mowat, V. (2004). Two cases of spontaneous pseudohermaphroditism in cynomolgus monkeys (Macca fascicularis). *J. Vet. Med. Assoc*., **51**:344-347.

Poth, T., Breuer, W., Walter, B., Hecht, W. and Hermanns, W. (2010). Disorders of sex development in the dog — Adoption of a new nomenclature and reclassification of reported cases. *Anim. Reprod. Sci*., **121**:197–207.

Tarunbir Singh, Beenish Quereshi, Pallavi Verma and Rahul Udheiya. (2019). Hermaphroditism in a Dog - A Report on its Diagnosis and Management. *Intas Polivet*, **20** (I): 161-163.

Villagomez, D., Parma, P., Radi, O., Di Meo, G., Pinton, A., Iannuzzi, L. and King, W.A. (2009). Classical and molecular cytogenetics of disorders of sex development in domestic animals. *Cytogenet. Genome Res*., **126**: 110-131.

Waghmare, J. E., Daf, S. K., Kamble, P. D., Pal, A. K. (2010) A rare and atypical Female pseudohermaphroditism with phallic urethra, bicornuate uterus and persistent cloaca. *Curr. Pediatr*. Res., **14**:86–88.