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Farhat H Bhat
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

Utsav Sharma
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

Nishi Pande
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

AK Pandey
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

Mir Mudasir
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

Incidence of canine pyometra in an around Jammu region

Farhat H Bhat, Utsav Sharma, Nishi Pande, AK Pandey and Mir Mudasir

Abstract
A study was undertaken on 12 pyometric bitches referred to Teaching Veterinary Clinical Complex (SKUAST-J) to study incidence of the disease and its signalment on the basis of history taken followed by thorough clinical examinations. Bitches suffering with pyometra were mainly of Labrador breed and belong to age group of 5-12 years. The common clinical signs reported were vulvar discharge, depressed general condition, inappetence, polydipsia, polyuria, vomition and dehydration. Diagnosis of pyometra was best made with the aid of ultrasonography. Ultrasound images were clear in 91.66% cases as compared to abdominal palpation, which revealed enlarged uterus in 16.66% cases only.

Keywords: Bitch; pyometra; Ultrasonography

Introduction
Canine pyometra is a disease syndrome that affects adult intact bitches causing a variety of clinical and pathologic signs of genital and systemic disease. The pyometra occurs at any age after the first estrus, typically it is a condition of the middle aged to older bitches, however, it mostly occurs at the mean age of 7.25 years but can also occur in bitches as young as 4 months to as old as 16 years of age. It is the accumulation of pus within the uterine lumen, typically occurring during or immediately following a period of progesterone dominance. The disease often causes subtle changes in the early stages, therefore the diagnosis is often made late in the disease process. Perfect and accurate diagnosis for pyometra becomes mandatory when the history is obscure. Since the clinical picture in pyometra is variable, pyometra may be confused with a variety of clinical conditions like pregnancy, renal failure, cystitis, vaginitis, vaginal neoplasia, polyarthritis etc (Christiansen, 1984) [1]. Bitches whelping rarely or never in their lives have a greater chance of developing pyometra (Romagnoli, 200) [2]. The present study is on incidence of the disease and its signalment on the basis of history taken followed by thorough clinical examinations.

Material and Methods
The present study was conducted on twelve bitches referred to the Teaching Veterinary Clinical Complex (SKUAST J) with the presumptive diagnosis of pyometra based on case history, physical examination, laboratory analysis and diagnostic imaging using ultrasonography. In physical examination the animal was thoroughly examined for condition of hair coat, hydration status and general body condition. In laboratory examination various physiological parameters viz. heart rate (beats per minute), respiratory rate (per minute) and rectal temperature (^{0}F) were recorded. Heart rate of the animals were recorded by using stethoscope while as respiratory rate was observed by keeping hand in front nostrils for one minute. The rectal temperature was recorded by using Clinical thermometer. Vaginal examination was done for evaluating the presence or absence of vulvar discharge. In cases where vulvar discharge was present it was examined for the colour and consistency. Ultrasonography was taken with the help of real-time B-mode 5-6.5 MHz transducer from the ventral position after proper restraining of the animal.

Results and Discussion
The data regarding the history and signalment of the 12 female dogs have been shown in the table 1 and table 2. The mean age of 12 bitches affected with pyometra included in the study was 8.25 ± 0.53 years with the range of 5-12 years which was closely in agreement with the certain reports (Dhaliwal *et al.,* 1998; Faldyna *et al.,* 2001 and Wehrend *et al.,* 2003) [3, 4, 5].

Correspondence
AK Pandey
Division of Veterinary Gynaecology and Obstetrics, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), R. S. Pura, Jammu, India

In the present experiment, 58.33% of the bitches affected were between 6-9 years of age (Fig. 1) which is in accordance with the findings of Simon *et al.* (2011) [6] who observed the pyometra in bitches of more than six years of age.

The results of the present study showed more incidence of pyometra in Labrador (33.33%). Higher incidence of pyometra in Labrador in this study bitches may be due to their higher population in the area. The claim that some breeds are more prone to pyometra than others (Niskakanen and Thrusfield, 1998) [7] was not observed in the present study due to an insufficient number of patients.

Nulliparity was associated with an increased risk (58.33%) of the pyometra, which is in agreement with the results from previous studies (Niskanen and Thrusfield, 1998; Baithalu *et al.,* 2010) [7, 8]. Clinical pyometra occurs most commonly during the luteal phase (Chaffaux and Thibier, 1978) [9] and in the present study the disease was diagnosed at the mean of 56.67 ± 4.86 days after the last estrus. This finding coincided with the finding of Haque and Ahmad (2003) [10]. Elevated concentrations of progesterone during the luteal phase cause increased uterine secretion, closure of cervix and decrease in uterine contractions, thus allowing accumulation of uterine glandular secretions which provide an excellent environment for bacterial growth (Nelson and Feldman, 1986) [11].

Signs like Inappetence and vomition in pyometra may be attributed to the toxic state induced by the pus filled uterus (Borresen, 1980) [12]. Severity of clinical signs has also been related to the degree of immunosuppression in bitches with pyometra (Faldyna *et al.*, 2001) [4].

Table 1: History of female dogs (n=12) affected with pyometra

S. No.	Breed	Age	Parity	Time since last estrous (in days)	Mating in last estrus
1	German shepherd	5 Years	Nulliparous	55	-
2	Labrador	6 Years	Nulliparous	50	+
3	German shepherd	10 Years	Primiparous	60	-
4	Labrador	8.5 Years	Primiparous	75	-
5	German shepherd	7 Years	Nulliparous	65	-
6	Pomeranian	12 Years	Nulliparous	40	-
7	Cocker spaniel	8 Years	Nulliparous	35	-
8	Labrador	8 Years	Nulliparous	35	-
9	Non-Descript	10 Years	Pluriparous	45	-
10	Labrador	8.5 Years	Primiparous	70	+
11	Dalmatian	9 Years	Nulliparous	60	-
12	Non-Descript	7 Years	Primiparous	90	+
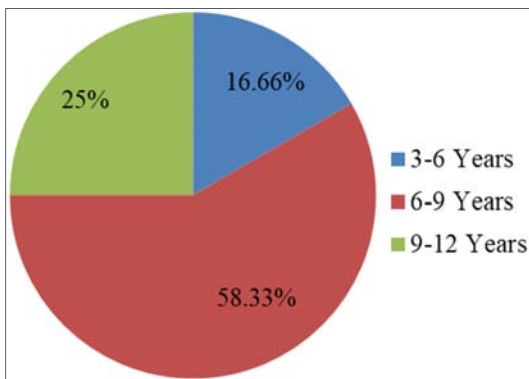
Fig 1: Age wise distribution of female dogs affected with pyometra

Table 2: Signalment/Signs of female dogs (n=12) affected with pyometra

Sign	No. of bitches	Percentage of bitches
Inappetence	9	75%
Vomition	5	41.67%
Polyuria	6	50%
Polydipsia	6	50%
Abdominal distention	4	33.33%
Vulvar discharge	10	83.33%

Clinical and physical examination
i. General condition
In the current study 6 (50%) bitches were moderately depressed and 4 (33.33%) were severely depressed. Only 2 (16.66%) out of 12 bitches were active at the time of presentation in the clinic (Table 3). Such observations are consistent with other reports (Haque and Ahmad 2003 and Hagman *et al.,* 2011) [10, 13].

ii. Hydration status
6 (50%) bitches appeared to have normal hydration status while the rest 6 (50%) had an abnormal skin turgor in present study (Table 3). These findings are in confirmation with the reports of Borresen (1979) [14] and Hagman *et al.* (2011) [13, 14]. Borresen (1979) [14] reported that only a few pyometric bitches showed signs of reduced tissue perfusion, although 56% patients were found to be dehydrated when assessed clinically.

The dehydration may lead to haemodynamic changes that are initially transient if compensated by adequate support and treatment. If the haemodynamic changes are uncompensated, endotoxic shock often leads to myocardial failure and death (Hardie and Kruse-Elliott, 1990) [15].

iii. Vulvar discharge
In the present study vulvar discharge was observed in 10 (83.33%) bitches. Feldman and Nelson (1987) reported the existence of closed pyometra in 15% cases. Character of vulvar discharge may be variable in consistency and light chocolate brown in colour (Baithalu *et al.,* 2010) [8]. In the present study the colour of the discharge varied from blood-tinged to bloody and yellowish-white to muddy. The consistency of discharge was graded as thin, thick homogenous and thick granular (Table 5).

A variety of signs may be detected by the owners, but the most common clinical finding in bitches with pyometra is a malodorous, sanguineous or mucopurulent vaginal discharge (Renton *et al.,* 1993; Feldman and Nelson, 2004) [16, 17]. In some bitches the amount of discharge is minimal and fastidious grooming by the bitch makes that discharge difficult to detect and in other cases signs of vaginal discharge may not be externally apparent, but vaginal smears and vaginoscopic examination reveal the presence of uterine

exudate in the cranial vagina (Verstegen *et al.*, 2008) [18]. The amount of vaginal discharge is also partially dependent on the degree of cervical patency.

Physiological parameters
In the present study the mean heart rate and respiration rate was 103.33 ± 3.11 and 32.83 ± 2.08 respectively (Table 4). These signs of elevated heart rate and respiration rate are in confirmation with the other reports (Borresen 1979; Hagman *et al.,* 2011) [14, 13].

In the current study fever was characteristic sign in 5 (41.66%) bitches and 2 (16.66%) bitches were hypothermic. Fever may be present in bitches with pyometra, but those with toxemia may actually be hypothermic (Hardy and Osborne, 1974) [19]. Borresen (1979) [14] reported 37% bitches to be febrile and 10% to be hypothermic while Hardy and Osborne (1974) [19] observed that 40% bitches had elevated body temperature and only 4% had subnormal temperature.

Endotoxins have been found responsible for increase in heart rate and respiration rate (Fransson and Ragle, 2003) [20], whereas fever is associated with uterine inflammation and secondary bacterial infection as well as septicemia or bacteremia that may culminate into shock with prolonged capillary refill time, weak femoral pulse and subnormal rectal temperature (Feldman and Nelson, 1987) [21].

Diagnosis
i. Abdominal palpation
In current study abdominal palpation revealed enlarged uterus in 2 (16.66%) cases only (Table 6). The uterine horns were unclear in 2 bitches due to fatty and tense abdomen and in rest of the bitches uterus was draining much of its contents, so it was difficult to palpate. However Singh *et al.* (2010) [22] reported that out of 5 pyometric bitches, uterus was enlarged in 4 bitches and in one bitch uterine horn was unclear due to tense abdomen. The size and weight of the bitch and the degree of abdominal relaxation determines the ease of uterine palpation (Feldman and Nelson, 1987) [21]. It may be difficult to palpate uterine enlargement especially in case of open cervix pyometra and in case of large and obese bitches, but in case of closed cervix pyometra the degree of uterine distention is greater and may be associated with visible

enlargement (Baithalu *et al.,* 2010) [8].

ii. Ultrasonography
The ultrasonographic detection of the uterus is easier at proestrus, estrus and early diestrus as compared to anestrus, because of its turgidity and 1-3 mm larger diameter (Yeager and Concannon, 1995) [23]. During early diestrus the uterine transverse sectional diameter continues to increase, although the appearance of uterus is similar to that seen during proestrus. The uterus may be more readily imaged in older, pluriparous bitches (England, 1995) [24]. In ultrasonography, two separate rounded echo-free areas represent the uterine horns where as somewhat more homogeneous anechoic mass suggest the presence of thick exudates surrounded by inhomogeneous hypoechoic area and thick uterine wall.

In the present study the diagnosis of pyometra was the best made with the aid of ultrasonography. Ultrasound pictures were clear in 11 (91.66%) cases and revealed the presence of pus in the uterus, but it was unclear and inconclusive for pyometra in one case (Table 6). Similar findings by Nyland and Mattoon (2002) [24] and Bilgardi *et al.* (2004) [26] reported that ultrasound imaging is the modality of choice to diagnose pyometra whether the case is of open or closed-cervix pyometra. The ultrasound findings typically include an enlarged uterus with convoluted, tubular horns filled with anechoic to hypoechoic fluid (Voges and Neuwirth, 1996) [27]. Ultrasound examination was able to clearly evaluate the variation of uterine wall thickness and revealed somewhat more homogeneous mass suggesting the presence of pus surrounded by inhomogeneous hypoechoic area.

Depending upon the nature of contents and the extent of involvement, the ultrasonographic characteristic of pyometra varies (Singh *et al.,* 2010) [22]. In 4 bitches there was extensive involvement characterized by round hypoechoic to anechoic areas placed side by side covering complete abdomen, whereas moderately involved 5 bitches exhibited hypoechoic roughly round structure ventral or ventro-lateral to the anechoic urinary bladder in transverse section. Mild involvement in 2 bitches was more readily visualized on longitudinal section as mixed anechoic to hypoechoic tubular structure.

Table 3: Clinical signs in female dogs (n=12) affected with pyometra

Character	Sign	No. of bitches	Percentage of bitches
General condition	Active	2	16.66%
	Moderately depressed	6	50%
	Severely depressed	4	33.33%
Hair coat	Normal	9	75%
	Dry-rough	3	25%
Hydration status	Normal	6	50%
	Mild dehydration	4	33.33%
	Moderate dehydration	2	16.66%

Table 4: Mean ± SE of different physiological parameters in normal and pyometric bitches

| Parameter	Pyometric bitches (n=12)	Normal bitches (n=6)
Heart rate (beats/minute)	103.33 ± 3.11	91.50 ± 1.27
Respiration rate/minute	32.82 ± 2.08	26.66 ± 1.98
Rectal temperature (°F)	101.18 ± 0.50	100.63 ± 0.17

Table 5: Characteristics of vulvar discharge in pyometric bitches

Nature	Type	No. of bitches	Percentage of bitches
Colour	Blood-tinged	5	41.67%
	Yellowish white	4	33.33%

	Bloody	2	16.66%
	Muddy	1	8.33%
Consistency	Thin	4	33.33%
	Thick homogeneous	6	50%
	Thick granular	2	16.67%

Table 6: Diagnostic methods employed and their efficiency for pyometra in bitches.

Technique	No. of animals	Result	% efficiency
Abdominal palpation	Clear	2	16.66%
	Unclear	10	
Ultrasonography	Clear	11	91.66%
	Unclear	1	
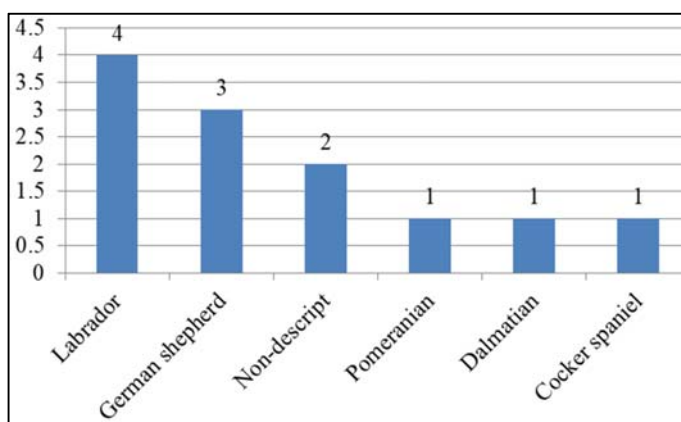
Fig 2: Breed wise distribution of female dogs affected with pyometra
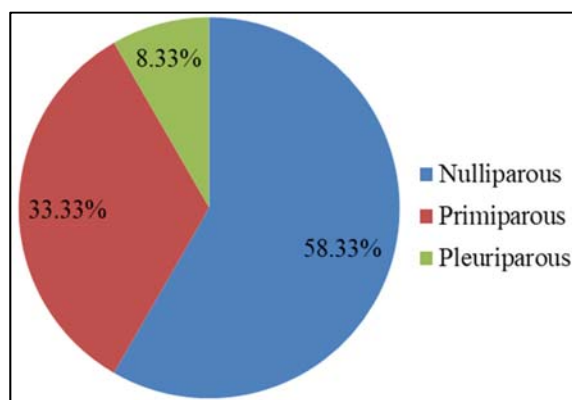
Fig 3: Parity of the female dogs affected with pyometra

Conclusion
Bitches suffering with pyometra were in age range of 5-12 years and Labrador breed was commonly affected. The clinical signs most commonly reported were vulvar discharge, Inappetence, polydipsia, polyuria, vomition and dehydration. Ultrasonography had more success rate for diagnosis than abdominal palpation.

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