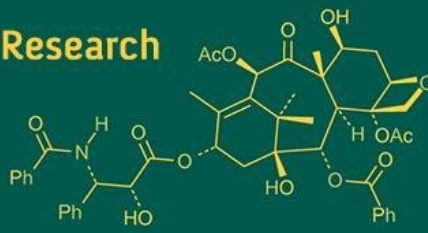


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Comparative clinical evaluation of surgical and conservative management of vaginal hyperplasia in bitches

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Abstract

Vaginal hyperplasia is an estrogen-dependent condition commonly observed in intact female dogs during proestrus or estrus and may progress to severe prolapse with associated complications. The present study was undertaken to evaluate and compare the clinical outcome of surgical and conservative management of vaginal hyperplasia in intact female dogs. Twelve dogs diagnosed with Type II or Type III vaginal hyperplasia were divided into two groups. Group I dogs were treated by partial vaginectomy combined with ovariohysterectomy, while Group II dogs were managed conservatively. Clinical outcome, recurrence and postoperative complications were assessed over a six-month follow-up period. Surgical management resulted in complete resolution without recurrence in all cases, whereas conservative management was associated with a high recurrence rate. The study highlights the superiority of surgical intervention combined with ovariohysterectomy as a definitive treatment for severe vaginal hyperplasia in non-breeding bitches.

Keywords: Vaginal hyperplasia, bitch, ovariohysterectomy, vaginectomy, prolapse

1. Introduction

Vaginal hyperplasia and prolapse is an estrogen-dependent condition observed primarily in intact female dogs during proestrus or estrus. Excessive estrogenic stimulation leads to edema and hypertrophy of the vaginal mucosa, resulting in eversion of the vaginal floor and in severe cases, complete prolapse through the vulvar lips (Schaefer-Okkens 2007) [6]. Although mild cases may regress spontaneously during diestrus, recurrence is common in subsequent estrous cycles (Jhonston *et al.* 2001) [5].

Breed predisposition has been reported, particularly in medium to large breeds and brachycephalic dogs, which may possess increased vaginal mucosal folding (Alan *et al.*, 2007) [2]. Age also plays a significant role, with most cases occurring during the active reproductive years (Gokula *et al.*, 2014) [4]. Based on severity, vaginal hyperplasia is classified into three types, ranging from mild mucosal eversion (Type I) to complete circumferential prolapse (Type III). Type I hyperplasia had a small to medium degree eversion of vaginal mucosa arouse from the floor of the vagina cranially towards the urethra with most of the mass confined to the vestibulum where as in Type II or incomplete prolapse which arouse from the vaginal floor, the protrusion could be observed through the vulvar labia. A complete protrusion of vaginal mass with involvement of entire circumference with exteriorization of the urethral orifice is seen in Type III prolapse cases (Schutte 1967; Bucci *et al.*, 2022) [8, 7]. Severe and recurrent cases are often associated with complications such as dysuria, ulceration, infection and tissue necrosis.

Various treatment modalities including conservative management, hormonal therapy and surgical intervention have been advocated. However, conservative approaches are frequently associated with recurrence (Galal *et al.*, 2018) [3]. Surgical excision of hyperplastic tissue combined with ovariohysterectomy addresses both the anatomical abnormality and the underlying hormonal cause. The present study aimed to evaluate and compare the clinical outcome of surgical versus conservative management of vaginal hyperplasia in intact female dogs.

2. Materials and Methods

2.1 Animals and Study Design

The present clinical study was conducted during 2024-2025 at the Veterinary Dispensary, Elada, The Nilgiris. A total of twelve intact female dogs exhibiting vaginal hyperplasia of

varying severity were included in the present study. Dogs that are clinically diagnosed as having Type II or Type III vaginal hyperplasia were randomly divided into two groups, each comprising six animals (Table 1).

Table 1: Signalment and Duration of Condition

Group	Age (years)	Breed	Type of vaginal hyperplasia	Duration of condition (days)	Dysuria
I	4	Labrador Retriever	Type III	30	Present
I	5	German Shepherd	Type III	28	Present
I	3	Pug	Type II	21	Absent
I	6	German Shepherd	Type III	35	Present
I	4	Labrador Retriever	Type II	25	Absent
I	5	Labrador Retriever	Type III	32	Present
II	4	German Shepherd	Type III	40	Present
II	6	Labrador Retriever	Type III	30	Present
II	5	Pug	Type II	10	Absent
II	7	German Shepherd	Type III	15	Present
II	5	Labrador Retriever	Type II	25	Absent
II	6	Labrador Retriever	Type III	30	Present

2.2 Treatment Protocol

In Group I, the dogs underwent partial vaginectomy combined with ovariohysterectomy under general anaesthesia. Group II dogs were managed conservatively using manual reduction, topical antiseptic therapy, systemic antibiotics, NSAIDs and supportive care.

2.3 Anaesthetic Procedure

In Group I, dogs were premedicated with atropine sulphate (0.04 mg/kg, subcutaneous), xylazine hydrochloride (1 mg/kg, intramuscular) and butorphanol tartrate (0.02 mg/kg, intramuscular). Anaesthesia was induced using a combination of ketamine hydrochloride (5 mg/kg, intravenous) and diazepam (0.5 mg/kg, intravenous), followed by endotracheal intubation. Anaesthesia was maintained with intermittent intravenous boluses of ketamine-diazepam as required. The animals were positioned in dorsal recumbency and the perineal region was clipped and aseptically prepared prior to surgery. In Group II, the dogs subjected to conservative management were sedated using the same premedication protocol comprising atropine sulphate (0.04 mg/kg, subcutaneous), xylazine hydrochloride (1 mg/kg, intramuscular) and butorphanol tartrate (0.02 mg/kg, intramuscular) to facilitate restraint and handling. Following adequate sedation, manual reduction of the prolapsed vaginal tissue was performed under aseptic precautions.

2.4 Surgical Approach

For surgical management (Group I), animals were positioned in dorsal recumbency with slight elevation of the hindquarters. The perineal region was clipped and aseptically prepared. A urinary catheter (8 Fr) was placed to protect the urethra and facilitate urine drainage throughout the procedure. The prolapsed vaginal tissue was carefully examined and stabilized using Allis tissue forceps. A circumferential incision was made at the base of the hyperplastic mass using a scalpel blade, ensuring complete excision while preserving surrounding structures. Hemostasis was maintained using a combination of direct pressure, mosquito artery forceps and absorbable suture ligation (PGA 2-0) as needed. The remaining vaginal mucosa was closed in a simple continuous pattern, taking care to maintain adequate luminal diameter (Mostachio and

et al., 2007) ^[10] (Fig 2). Simultaneously, a routine ovariohysterectomy was performed through a midline abdominal approach to prevent hormonal stimulation and recurrence. Postoperative wound care involved regular antiseptic dressing using Betadine solution combined with topical application of Mupirocin ointment (Staphban, Savavet) until complete healing.

In Group II, dogs subjected to conservative management were adequately anaesthetised, following which 2% lignocaine gel was applied over the prolapsed vaginal tissue to provide local analgesia and facilitate manipulation. Manual reduction of the prolapsed tissue was then performed and the vaginal mucosa was repositioned to its normal anatomical location. A purse-string suture was placed around the vulvar opening to prevent recurrence of prolapse (Chauhan *et al.*, 2020) ^[12]. The retention sutures were removed following complete resolution of the prolapse.

2.5 Postoperative care and follow-up

Postoperative wound care in surgically treated dogs included antiseptic dressing with povidone iodine and topical application of mupirocin ointment until complete healing. All dogs were monitored for resolution of prolapse, recurrence, persistence of dysuria and postoperative complications for a period of six months.



Fig 1: Type III vaginal Hyperplasia



Fig 2: Circumferential simple continuous closure of vaginal mucosa after excision of necrotic mass



Fig 3: Resected vaginal hyperplastic mass

2.6 Statistical Analysis

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) software Version 20.0 (Snedecor and Cochran 1980) [19]. The association between treatment modality and clinical outcome was analysed using Chi-square test. Differences were considered statistically significant at $p < 0.05$.

3. Results

The age of the affected dogs ranged from 3 to 7 years, with the majority of cases (8/12; 66.7%) occurring between 4 and 6 years of age. Medium to large breed dogs predominated, with Labrador Retrievers (5/12) and German Shepherd Dogs (4/12) being most frequently affected. Two cases were recorded in Pugs, representing brachycephalic breeds.

Type III vaginal hyperplasia was observed in 8 out of 12 dogs (66.7%), while Type II hyperplasia was recorded in 4 dogs (33.3%). Dysuria was present in 7 dogs (58.3%), predominantly among those affected with Type III prolapse. The duration of the condition at presentation ranged from 10 to 40 days, with longer duration generally associated with severe prolapse (Table 2).

Table 2: Clinical Outcome Following Treatment

Parameter	Group I (n = 6)	Group II (n = 6)
Complete resolution	6 (100%)	2 (33.3%)
Recurrence	0 (0%)	4 (66.7%)
Persistence of dysuria	0 (0%)	3 (50%)
Post-treatment complications	0 (0%)	2 (33.3%)

All dogs in Group I (surgical management) showed complete resolution of vaginal hyperplasia (100%) following partial vaginectomy combined with ovariohysterectomy. None of the surgically treated dogs exhibited recurrence or persistence of dysuria during the six-month follow-up period. No post-treatment complications were observed in this group.

Conversely, dogs managed conservatively in Group II showed a lower success rate. Only 2 out of 6 dogs (33.3%) achieved complete resolution without recurrence, while 4 dogs (66.7%) experienced recurrence of prolapse during the follow-up period. Persistence of dysuria was noted in 3 dogs (50%) and post-treatment complications such as repeated prolapse and local irritation were observed in 2 dogs (33.3%).

Statistical analysis revealed a significant association between treatment modality and clinical outcome, with surgical management resulting in significantly better resolution and lower recurrence compared to conservative treatment.

All dogs in the surgical group showed complete resolution of vaginal prolapse without recurrence. Dysuria resolved immediately following surgery. No postoperative complications were recorded. In contrast, only two dogs in the control group showed complete resolution, while four exhibited recurrence during subsequent estrous cycles. Statistical analysis revealed a significant difference between groups ($p < 0.05$).

4. Discussion

Vaginal hyperplasia is a well-recognized estrogen-dependent condition of intact bitches, commonly occurring during proestrus or estrus. In the present study, most affected dogs were between four and six years of age, corresponding to the period of peak reproductive activity. This finding is consistent with earlier reports describing a higher incidence during early to mid-reproductive life (Johnston *et al.*, 2001; Schaefer-Okkens, 2007) [5, 6]. Breed predisposition observed in this study supports previous observations that medium to large breeds such as Labrador Retrievers and German Shepherd Dogs are more frequently affected (Galal *et al.*, 2018) [3]. The occurrence of vaginal hyperplasia in brachycephalic breeds such as Pugs further corroborates the observations of Schutte (1967) [8] and subsequent authors, who suggested that increased vaginal mucosal folding and breed-related anatomical conformation may contribute to the severity of prolapse.

The predominance of Type III vaginal hyperplasia in the present study explains the higher incidence of dysuria and prolonged duration of clinical signs. Severe circumferential prolapse with exteriorization of the urethral orifice predisposes affected animals to urinary obstruction, tissue trauma and secondary infection. Conservative management resulted in a high recurrence rate (66.7%), which aligns with previously reported recurrence rates of 66-100% during subsequent estrous cycles (Johnston *et al.*, 2001) [5]. Although manual reduction and retention sutures may provide temporary relief, they fail to eliminate the underlying estrogenic stimulation, resulting in recurrence once estrus resumes.

In contrast, surgical excision of hyperplastic tissue combined with ovariohysterectomy resulted in complete resolution without recurrence, consistent with earlier reports (Post *et al.*, 1991; Ahuja *et al.*, 2017) [11, 1]. Elimination of

ovarian estrogen prevents further mucosal hypertrophy, while partial vaginectomy corrects the existing anatomical defect. Surgical management was therefore superior to conservative treatment in preventing recurrence. While conservative therapy may be considered in mild cases, recurrence remains a major limitation. The small sample size is acknowledged as a limitation of the study.

5. Conclusion

The findings of the present study suggested that while conservative management may be attempted in mild cases or breeding animals, surgical intervention combined with ovariohysterectomy remains the treatment of choice for advanced vaginal hyperplasia, offering permanent resolution and improved quality of life.

CRedit authorship contribution statement

Rajesh Kumar K: Methodology, Writing-Original draft, review & editing, conceptualization. Subramaniam Kathiravan: Writing-review & editing, validation, investigation, data curation. Rajasekaran T.M.: Writing-review & editing, validation, investigation, data curation, data analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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