Vaginal cysts: a common pathologic entity revisited

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Summary

Purpose: To further study the clinicopathological features of benign vaginal cysts. *Methods:* We retrospectively studied all cases of benign vaginal cysts diagnosed in our laboratory over the last decade. Pathological findings were correlated with the clinical records of the patients and histochemistry results. *Results:* Forty cases of benign vaginal cysts were retrieved. There were 12 cases of mullerian cysts (30.0%), 11 cases of Bartholin's duct cysts (27.5%), ten cases of epidermal inclusion cysts (25.0%), five cases of Gartner's duct cysts (12.5%), one endometrioid cyst (2.5%) and one unclassified cyst (2.5%). Patient age ranged from 20 to 75 years with a mean of 35 years, and a peak incidence between 31-40 years (13 cases, 32.5%). The majority of patients were asymptomatic (31 cases, 77.5%). The cyst type which was more frequently associated with symptoms was Bartholin's duct cyst. Most lesions were located in the left-lateral vaginal wall (13 cases, 32.50%). Mullerian cysts were lined by columnar endocervical-like or cuboidal epithelium, whereas Gartner's duct cysts were all lined by cuboidal epithelium. Epidermal inclusion cysts were lined by stratified non-keratinizing squamous epithelium. Bartholin's duct cysts were lined by transitional, mucin-rich columnar or squamous epithelium and were frequently accompanied by inflammation. *Conclusion:* Benign vaginal cysts are in the majority of cases asymptomatic and are often incidentally discovered during gynecological examination for other purposes. The differential diagnosis between Mullerian and Gartner's duct cysts requires histochemical evaluation of epithelial mucin production. The pathogenesis of most types of vaginal cysts remains to be clarified.

Key words: Vaginal cysts; Mullerian; Gartner's duct; Bartholin's duct; Epidermal inclusion; Endometriosis.

Introduction

The vagina is a remarkable organ with many unexplored properties, both structural and functional. However, as described elegantly by Schmidt, *"the vagina attracts too little serious or sustained study. It seems almost an afterthought in the minds of most pathologists, a structure serving only to connect other far more interesting reproductive organs which harbor more curious and challenging diseases"* [1]. Indeed, a review of the relevant literature reveals mostly case reports of rare neoplasms or other unusual pathologic conditions [1]. Clinicopathological studies of common vaginal lesions, such as vaginal cysts, are only scarcely conducted.

Vaginal lesions are generally classified into the following types of disorders: developmental, infectious inflammatory, noninfectious inflammatory, cystic, neoplastic and those that follow trauma, surgery and radiation [2]. Vaginal cysts in particular can be divided into several different types according to their lining epithelium: Mullerian, epidermal inclusion, Bartholin's duct, Gartner's duct (mesonephric) cysts, and other rarer cystic lesions such as emphysematous vaginitis, endometriosis, dermoid and urothelial cysts [2, 3]. The majority of these lesions produce mild symptoms, if any, and present as incidental findings in women with other complaints. However, they may also be the cause of pain, dyspareunia or inflammation or even grow large enough to cause vaginal pressure and urinary obstruction [4]. Although clinical history, physical examination and – to a lesser degree – radiological imaging techniques are essential in the initial evaluation of the patient, permanent histopathology of the operative specimen is the only accurate method of establishing the final diagnosis. The choice of the adequate treatment depends mostly on the severity of symptoms [4].

The aim of the present study was to review the clinicopathological features of all benign vaginal cysts diagnosed in our laboratory over the last decade and compare our findings with those of previously published series.

Materials and Methods

After reviewing the archival files of our laboratory for the last 10-year period (1996-2005), we retrieved 40 cases of vaginal cystic lesions. The relative clinical records were also retrieved, reviewed and correlated with the pathological findings (both gross and histological). Representative slides for each case were reexamined by two independent pathologists. Additional sections were obtained in nine cases, and stained by mucicarmine stain.

Results

Clinical features: age, symptoms, location and treatment of lesions

A summary of the clinical findings of all cases included in our study is provided in Table 1.

Age and symptoms: The patients' age ranged from 20 to 75 years with a mean of 35 years, and a peak incidence between 31-40 years (13 cases, 32.5%). The majority of patients were asymptomatic (31 cases, 77.5%) and were diagnosed with a vaginal cyst while being examined for

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Table 1. — *Clinical findings in 40 patients with benign vaginal cysts.*

Cyst type*	No. of cases (%)	Mean age (years)	Symptoms (no. of cases)	Location (no. of cases)	Mean size (cm)
Mullerian	12 (30.0%)	40.89	None (12)	Ant (3) Post (4) LL (3) RL (2)	1.78
Bartholin's gland	11 (27.5%)	41.40	Dysp (5) Pain (4) None (4)	LL (5) RL (6)	2.34
Epidermal inclusion	10 (25.0%)	48.22	None (8) Pain (2)	Ant (2) Post (1) LL (3) RL (4)	2.7
Gartner's duct	5 (12.5%)	34	None (5)	Ant (3) LL (2)	2.1
Endometrioid	1 (2.5%)	26	None (1)	Post (1) Fornix	2
Unclassified	1 (2.5%)	43	None (1)	Post (1)	1
Total	40 (100%)	35	None (31/77.5%) Pain (6/15.0%) Dysp (5/12.5%)	Ant (8/20%) Post (7/17.5%) LL (13/32.5%) RL (12/30%)	2.19

Ant: anterior, Post: posterior, LL: Left-lateral, RL: Right-lateral, Dysp: dyspareunia. *As proven by histological examination.

symptoms or conditions related to various other gynecological disorders including incomplete abortion, cervical dysplasia, endometrial hyperplasia or carcinoma, leiomyomatous uterus and uterine prolapse (total of 20 cases) or during their routine gynecological examination (11 cases). In the remaining symptomatic cases, dyspareunia (7 cases, 17.50%) and pain (6 cases, 15%) were the commonest clinical manifestations. The cyst type which was more frequently associated with symptoms was Bartholin's duct cyst, where the majority of cases (6 out of 10) presented with pain and/or dyspareunia. With the exception of two patients with epidermal inclusion cysts which presented with pain, none of the remaining patients reported any symptoms related to the vaginal cyst.

Location: Most lesions were located in the left-lateral vaginal wall (13 cases, 32.50%), followed by the right lateral wall (6 cases, 32.50%), the anterior wall (8 cases, 20%), the posterior wall (6 cases, 15%) and, finally, the posterior fornix (1 case, 2.5%) (Table 1). The location of epidermal inclusion cysts in particular correlated in the majority of cases (6 out of 10) with an area of previous surgical trauma (obstetrical procedure in 4 cases, hysterectomy in 2).

Treatment: All cases were treated with local excision of the lesion: 32 cases (80%) were clinically evident during physical examination, while the remaining eight cases (20%) were incidentally discovered in vaginal biopsies or hysterectomy specimens removed for other reasons. The latter were asymptomatic and smaller than 1 cm in diameter.

Pathologic (gross and microscopic) features. Histochemistry results

Size: On gross examination, the size of the cysts ranged from 0.4 to 5.5 cm (mean 2.19 cm), with most lesions (25 cases, 62.5%) measuring 1-2 cm in diameter. The mean size per histological type of lesion was as follows: 1.78 cm for mullerian, 2.7 cm for epidermal inclusion, 2.34 cm for Bartholin's duct cysts and 2.1 cm for Gartner's duct cysts. The endometriotic cyst and the unclassified cyst measured 2 cm and 1 cm, respectively.

Gross findings (other than size): The cysts were filled with serous, mucinous or purulent-like fluid. Their inner and outer surfaces were smooth, and the thickness of their walls ranged from 0.1 to 0.3 cm.

Histological and histochemical findings: Table 2 presents the pathologic classification of our study material after combining the results of microscopic and histochemical examination. Mullerian duct cysts were lined by columnar endocervical-like or cuboidal epithelium (Figure 1), whereas Gartner's duct cysts were all lined by cuboidal epithelium (Figure 2). Mucus secretion was microscopically evident in eight cases, initially typed as Mullerian. The performance of histochemistry (mucicarmine stain) revealed the presence of mucus-secreting epithelium in four additional Mullerian cysts, which were initially misinterpreted as Gartner's duct cysts. Mucicarmine stain was negative in five cases which were finally diagnosed as Gartner's duct cysts.

Table 2. — *Pathologic classification of 40 benign vaginal cysts before and after the performance of histochemistry (mucicarmine stain).*

Cyst type	No. of cases (%)	Histochemistry
Mullerian	8* (20.0%) 12**(30.0%)	Mc (+) in 4 cases
Bartholin's gland	11 (27.50%)	–
Epidermal inclusion	10 (25.0%)	–
Gartner's Duct	9* (22.5%) 5** (12.5%)	Mc (-) in 5 cases
Endometrioid	1 (2.5%)	–
Unclassified	1 (2.5%)	–
Total	40 (100%)	–

Mc: mucicarmine; *initial classification (without histochemistry); **final classification (after the performance of histochemistry).

Epidermal inclusion cysts were lined by stratified non-keratinizing squamous epithelium and were filled with keratin (Figure 3). Cyst rupture with a granulomatous reaction was noticed in two cases, accompanied by stromal calcifications in one.

Bartholin's duct cysts were lined by transitional, mucin-rich columnar or squamous epithelium (Figure 4). Chronic and/or acute inflammation was noted in the majority of cases (7 out of 10).

Diagnosis of endometrioid cysts was based on the presence of endometrial glands and endometrial stroma. Hemosiderin-laden macrophages, suggesting old hemorrhage, were also noted.

We failed to identify the presence of epithelium in one cyst, which was thus coded as "unclassified".

Discussion

According to previous studies and literature reviews, benign vaginal cysts are typically encountered in women of reproductive age, most commonly in the third and fourth decades of life, while the occurrence in other age

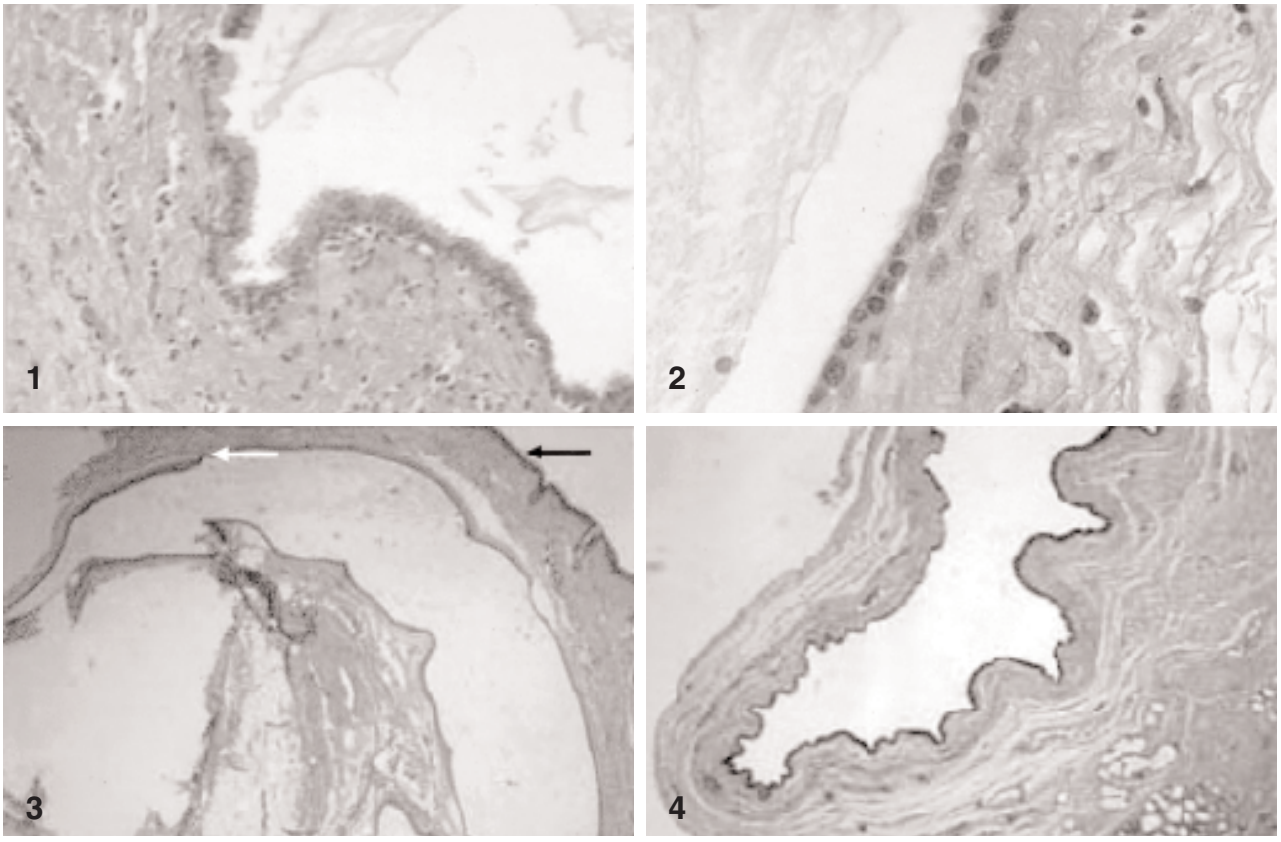

Figure 1. — Histological section of a vaginal cyst lined by mucus-producing endocervical-type epithelium (mullerian cyst) (hematoxylin-eosin x 100).
Figure 2. — Histological section of a vaginal cyst lined by simple cuboidal epithelium (Gartner's duct cyst) (hematoxylin-eosin x 250).
Figure 3. — Histological section of a vaginal epidermal inclusion cyst, lined by stratified squamous epithelium (white arrow). Part of the vaginal wall is evident (black arrow) (hematoxylin-eosin x 250).
Figure 4. — Histological section of a typical Bartholin's duct cyst (hematoxylin-eosin x 100).

groups (infants, children, adolescents and postmenopausal patients) is relatively rare [1, 5, 6]. In the majority of cases these lesions are asymptomatic and are discovered during physical examination for irrelative symptoms or even as incidental histopathologic findings in vaginal biopsies or hysterectomy specimens surgically excised for other pathologic conditions [5, 6]. Symptomatic cases may present with a feeling of abdominal discomfort, vaginal pain or bleeding, dyspareunia or urinary symptoms such as incontinence or obstructive voiding symptoms [5, 6]. The presence and severity of this symptomatology is directly related to the cyst size, with larger lesions more frequently warranting excision [5]. In our study, the peak incidence was noted between 31-40 years of age, and the large majority of women were totally asymptomatic, with the notable exception of six patients with Bartholin's gland cysts and two patients with epidermal inclusion cysts, who presented with pain and/or dyspareunia.

The embryology of the vagina has been the object of significant controversy in the past. In contrast to the initial statement expressed by Schmidt [1] that all of the vaginal epithelium is of urogenital sinus origin, it is now generally agreed that both the mullerian ducts and the urogenital sinus contribute to the formation of the vagina [2, 7-10]. The vagina is therefore considered an organ of dual origin, with a native lining of mullerian-type columnar cells that are retained unless there is a contribution of squamous cells from the urogenital sinus [2]. Some vaginal cysts are believed to be embryological derivatives, and are classified by some researchers under the "congenital" category (versus the "acquired" type), which mainly comprises two types of cysts: those of the mesonephric duct (Wolffian duct, Gartner's duct) and those of paramesonephric duct (Mullerian duct) origin [1]. Although the differential diagnosis of these congenital remnants is of limited clinical significance, with no effect whatsoever on the prognosis and treatment of the patient, it is of great theoretical interest with regard to embryology. Most authors suggest that among the congenital cysts, Mullerian duct cysts predominate while Gartner's duct cysts are rare, and that mullerian cysts may be found in various locations in the vagina, while Gartner's duct cysts are typically found in the anterolateral area [2, 6, 11]. Nevertheless, these features do not allow an accurate differential diagnosis, and the only way to properly classify these cysts is the evaluation of epithelial mucin production [12]. Deppisch [11] in his study of 64 vaginal cysts, as well as Pradhan and Tobon [6] in

their review of 41 cases, suggested that mucicarmine histochemical staining may safely differentiate mullerian mucus-producing cysts from those of Gartner's duct which are devoid of cytoplasmic mucin. Our own results reaffirm this view, since four of our cases, which were originally classified as Gartner's duct cysts were found to be Mullerian in origin after the performance of histochemistry (mucicarmine stain was positive in the epithelium lining the cysts). Furthermore, the mullerian cyst was the predominant cyst type found in our series, accounting for 30% of the total of cases.

The differential diagnosis of mullerian cysts should further include Bartholin's gland cysts originating in an acinus, which are also lined by mucus secreting epithelium [5, 6, 13]. Bartholin's gland cysts arising from the main duct are lined by transitional or squamous epithelium [5]. Cysts that arise in the area of the Bartholin gland commonly result from dilatation of Bartholin's duct due to ductal obstruction, associated with either a highly viscous thick mucoid secretion or gland infection, and are typically located in the lateral introitus [2, 5]. Histologically, chronic and/or acute inflammation are relatively common findings, and were also found in most of our cases. From the clinician's point of view, it should be emphasized that those lesions associated with pain or introital obstruction require surgical treatment, with marsupialization representing the treatment of choice, while in cases with recurrent abscess formation, excision of both gland and cyst may be useful [2, 4, 5].

Epidermal inclusion cysts are often secondary to obstetrical or other surgical procedures, and are considered as the most common nonembryological type of vaginal cysts [2, 5, 12]. Our results, as well as those of Pradhan and Tobon confirmed these observations: in the latter study as well as in our own, the locations of the reported epidermal inclusion cysts correlated with the sites of a previous surgical trauma [6]. Epidermal inclusion cysts are easily recognized microscopically by the presence of stratified squamous, non-keratinising epithelium, which may show evidence of neoplastic changes, when the prior surgery was done for intraepithelial lesions of the cervix or the vagina [1]. Cyst rupture may result in a granulomatous reaction, as previously reported and as noted in two of our cases [1].

Primary endometriosis of the vagina is rare, and usually represents a manifestation of pelvic disease [5, 12]. Nevertheless, in our case there was no clinical evidence or any history of endometriosis located elsewhere in the pelvis. Endometrioid cysts are usually located in the posterior fornix of the vagina and have a typical chocolate-like appearance [5]. The histological criteria required for the diagnosis of endometriosis include the presence of the following three characteristics: endometrial glands, endometrial stroma and hemosiderin-laden macrophages [5]. Treatment usually involves excision of larger lesions and destruction of the smaller ones by laser vaporization [5, 12]. The risk of malignant transformation, although small, cannot be ignored, thus posing the need for early diagnosis and treatment of these lesions [12, 14-16].

In the absence of an epithelial lining no proper classification of the cyst can be made. According to Pradhan and Tobon [6], this category could be classified as simple cysts, in a way analogous to ovarian cysts lacking discernible epithelium. However, when the cyst is small, it is practically impossible to verify that the absence of epithelium is not due to the technical procedures employed during surgical excision and pathologic processing of the tissue. Thus we preferred to retain the term "unclassified" for the single case of a vaginal cyst without apparent epithelium.

In conclusion, the results of our study reaffirm those of previous series. However, further research is needed to enrich the existing data regarding the clinicopathological features of benign vaginal cysts and to shed more light on the pathogenesis.

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