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Incidence, Presentation and Management of Bartholin's Gland Cysts/Abscesses: A Four-Year Review in Federal Teaching Hospital, Abakaliki, South-East Nigeria

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Abstract

Background: The Bartholin's gland cysts and abscesses are one of the most common vulva cyst or abscesses in gynaecological practice. Symptomatic cases give significant discomfort to sufferers and have a negative impact on their quality of life. Objective: To investigate the incidence, pattern of presentation and management of Barthholin's gland cysts and abscesses in the Federal Teaching Hospital Abakaliki (FETHA) Ebonyi State, Nigeria. Methodology: This was a four-year retrospective study of cases of Bartholin's gland cysts and abscesses in FETHA. We studied all cases of Bartholin's gland cysts and abscesses that were managed at the Federal Teaching Hospital Abakaliki from 1st January 2012 to 31st December 2015. Results: During the study period, there were 1015 gynaecological surgical cases of which 18 were for Bartholin's gland cysts or abscess giving an incidence of 1.78%. The mean age of the patients was 28.8 ± 5.6 years with 61% of the patients within the age range of 21 to 30 years. The commonest risk factor that was found for the occurrence of Bartholin's gland cyst or abscess was previous history of the disease in 14 (77.8%) followed by previous history of sexually transmitted diseases 8 (44.4%). Pain was the commonest presenting symptom in 14 (77.8%) of cases. The left vulva was the commonest site of disease as noted in 15 (83.3%) of patients. *Escherichia coli* and *Staphylococcus aureus* were the commonest isolates on swabs with 16 (88.9%) and 14 (77.8%) prevalence respectively. The disease presented commonly in form of abscess as observed in 10 (55.6%) of patients. All the patients had Marsupialization as the modality of treatment. Conclusion: Symptomatic Bartholin's gland cyst and abscess cause significant morbidity for the sufferers and decreased quality of life. Accurate diagnosis and treatment is advocated to prevent chronicity and complications. Although options of treatment abound, Marsupialization remains the mainstay of treatment in low resource setting like ours.

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Keywords

Bartholin's Cyst, Abscesses, Abakaliki, Nigeria, Incidence, Presentation and Marsupialization

1. Introduction

Bartholin's gland cysts and abscesses are the commonest gynaecological cystic disease of the vulva occurring in gynaecological practice all over the world as cystic growth of the labia majora [1].

Approximately 2% of women, mostly in their reproductive age would develop Bartholin's gland cyst or abscess at some point in their life [2]-[7]. Abscesses are almost three times commoner than the cysts [3] [8].

The Bartholin's glands (Greater vestibular gland) were first described by the Danish Anatomist, Casper Bartholin in the 17th century [2]. They are a pair of pea-sized glands located symmetrically at the posterior region of the vaginal wall, lateral to the bulbocavernosus muscle. They are oval in shape with an average size of 0.5 - 1 cm and drain through ducts about 2 - 2.5 cm in length and 0.5 mm in diameter that open at the 4 and 8 o'clock positions between the labia minora and hymenal edge into the vestibule [1]-[3]. The organs play an important role in the female reproductive system and its main function is to secret mucus that lubricates the vagina and vulva especially during sexual intercourse [2]-[4]. Obstruction of the Bartholin's duct may result in the retention of secretions with resultant dilatation of the duct and cyst formation. The cyst may become infected and an abscess may develop in the gland [3]-[6]. A Bartholin's duct cyst does not necessarily have to be present before a gland abscess develops [2] [3]. Symptomatic Bartholin gland cysts and abscesses can be associated with significant discomfort and disruption of the sexual function and daily activities of women [6].

Clearly identified causes for Bartholin's cysts and abscesses are elusive, however the risk profile is similar to those of women at risk for sexually transmitted diseases [7] [9]. Some risk factors include previous history of Bartholin's gland cyst, multiple sexual partners, sexually transmitted infection, medio-lateral episiotomies, vulva trauma [1] [4] [7]. There is a gradual involution of the gland as from 30 years of age, hence a higher incidence occurs between 20 - 30 years while high parity seem to be associated with lower incidence [3] [8].

Obstruction of this gland's duct is common and may follow infection, trauma, and changes in mucus consistency or congenitally narrowed ducts [1] [3] [9]. When the distal ducts are blocked, there is mucus build-up with continued secretion, cystic dilation of the duct leading to cyst formation. Infection of this cyst is likely to result in Bartholin's gland abscess [1]-[10].

Bartholin's cysts are generally asymptomatic and may be discovered on routine pelvic examination but when they become significantly enlarged, they can cause discomfort while walking and during sexual intercourse. Infection of the cyst leads to abscess formation which is associated with severe pain, dyspareunia, fever and limitation of physical activity [1] [10]-[14]. Bartholin's Cysts or abscesses which are usually unilateral distends the affected labia majora causing vulva asymmetry and a vaginal discharge may be present [14]. When palpable, it is fluctuant and may or may not be tender but abcesses can be extremely tender [9] [12] [15]-[18].

Discharge from the gland if present should be sent for culture and sensitivity [8]. In its absence, swabs are taken from endo-cervix, rectum, vagina and urethra for microbial culture and sensitivity [5] [8] [9] [16]-[18]. Isolated organisms are usually polymicrobial, but *Bacteroides* spp. and *Escherichia coli* predorminate [1] [9]. Other organisms such as *Staphylococcus aureus*, *Neisseria gonorrhea*, *Chlamydia trachomatis* have also been implicated [6] [9] [10]. Biopsy and histology is recommended in women over 40 years due to fear of possible malignancy [1] [2] [15].

Asymptomatic Bartholin's gland cyst may be managed expectantly [2] [3]. Conservative management of symptomatic cysts or abscesses may include warm sitz baths, compresses, analgesics and antibiotics when appropriate [4] [8] [10] [12]. Persistent and symptomatic cysts and abscesses are best treated surgically [10] [12]. Although there are many treatment modalities for this condition. Maruslpialization, is generally favoured especially in low resource setting because it has low recurrence rate and the function of the gland is preserved [2] [3] [6]. Post-operatively, antibiotics chemotherapy should be given depending on sensitivity pattern but the drug should be broad spectrum [2] [3] [8] [11] [18] [19].

Complications of Bartholin's gland cysts or abscesses include recurrence, severe pain, dyspareunia, difficulty in walking, psychological trauma due to stigmatization, marital disharmony and equally those from the treat-

ment procedure such as haemorrhage, pyogenic granuloma, aneasthetic problems, post-operative infection. [1]-[13] [20].

Literatures are scanty in this region regarding this all important condition and none has been reported from our centre, Federal teaching Hospital Abakaliki (FETHA). This work is therefore conceived to establish the incidence, mode of presentation and management of Bartholin's gland cyst/abscess in our centre and to compare our findings with the findings of other workers elsewhere.

2. Methodology

2.1. Study Background

Ebonyi State is one of the five states in the South-East Geopolitical zone of Nigeria. It was created in 1996 from the largely rural areas of the pre-existing Enugu and Abia states. It has an estimated population of 2.1 million people (2006 census) and occupies a land mass of 5932 km^2, sharing boundaries in the West with Enugu state, Cross-river in the South and Benue state in the North. There are 13 general hospitals, one in each LGA and the Federal Teaching Hospital Abakaliki is located within the centre of the state capital. It receives referrals from the general hospitals, mission hospitals and primary health centres as well as privately owned hospitals and clinics. It also receives referral from neighboring states of Benue, Enugu, Cross-River and Abia.

2.2. Materials and Methods

This was a retrospective study of all cases of Bartholin's cyst or abscess managed at Federal Teaching Hospital, Abakaliki in Ebonyi State, South-East Nigeria from 1st January, 2012 to 31st December, 2015. (A 4-year period). Records of the gynaecology clinic, emergency unit, operating theatre and gynaecology ward were reviewed and their records retrieved from the medical records department. Relevant information including socio-demographic data, mode of presentation, side of the vulva affected, presence of abscess or cyst, previous history of Bartholin's cyst or abscess, risk factors, treatment modality, complications and recurrence. Descriptive statistics was used in calculating percentages, mean, and standard deviation. Data processing and analysis were carried out using SPSS version 17 (Statistical package for social sciences).

2.3. Ethical Approval

Ethical approval was obtained from the ethics committee of the FETHA before embarking on this study while request for approval for patient's case files where sought and obtained from Head of health information department of the hospital with a pledge to protect patients privacy.

3. Results

During the study period there were 21 cases of Batholin's glands abscess/cysts but the case note of 18 patients 85.7% of the files retrieved had complete information and were used for the study. 18 patients presented with Bartholin's gland cyst or abscess out of the 1015 gynaecological surgeries at the Federal Teaching Hospital Abakaliki 18 were for Bartholin's gland cysts or abscesses giving an incidence of 1.8% or 1 Bartholin's cyst or abscess to 56 surgeries.

Table 1 shows the demographic characteristics of the patients. Eleven of them constituting 61% were between 21 - 30 years of age while the extremes of reproductive age groups 11 to 20 and 41 to 50 years had the least patient contributing 1(5.6%) each. The average age of the patients was 28.8 ± 5.6 years.

Table 2 shows the risk factors associated with the patients. The major risk factors common to the patients were previous history of Bartholin's abscess or cyst in 14 (77.8%), past or present history of sexually transmitted infections in 8 (44.4%) and previous episiotomy in 6 (33.3%). In some instances, some patients had multiple risk factors. **Table 3** shows the presenting complaints of the patients and pain in 14 (77.8%) was the commonest complaints while dyspareunia, discomfort during walking contributed 10 (55.6%) and 6 (33.3%) respectively. Four patients 22.2% had surgery because they wanted better cosmesis of their vulva and not necessarily due to any symptom. **Table 4** shows the site of the disease at presentation and 83.3% (15 patients) had left vulva abscess or cyst. The commonest organism isolated from the patients was *Escherichia coli* in 16 (88.9%) followed by *Staphylococcus aureus* in 14 (77.8%) and *Neisseria gonorrhea* in 4 (22.2%). In some instances, some patients had multiple organisms from the culture (**Table 5**).

Table 1. Socio-demographic characteristics of the patients.

S/No.	Frequencies	Percentage (%)
1. Age (years)		
11 - 20	1	5.60
21 - 30	11	61.00
31 - 40	5	27.80
41 - 50	1	5.60
2. Educational status		
No formal education	3	
Formal education	15	
Total	18	
3. Marital status		
Married	8	
Single	10	
Divorced	-	
Total	18	

Table 2. Risk factors.

Risk Factor	Frequency	Percentage (%)
Previous history	14	77.8
Sexually transmitted diseases	8	44.4
Episiotomies	6	33.3
Multiple sexual partners	4	22.2
Trauma	3	16.7

Table 3. Symptoms on presentation.

Symptom	Frequency	
Pain	14	77.8
Dyspareunia	10	55.6
Walking discomfort	6	33.3
Cosmesis	4	22.2

Table 4. Site of disease.

Vulva	Frequency	Percentage (%)
Right	3	16.7
Left	15	83.3
Total	18	100

Table 5. Microbiological organisms of isolates.

Organism	Frequency	Percentage (%)
Escherichia coli	16	88.9
Staphylococcus aureus	14	77.8
Neisseria gonorrhea	4	22.2
Others	-	-

The commonest diagnosis or presentation as shown in **Table 6** was Bartholin's abscess in 10 (55.6%) and Bartholin's cyst which occurred in 8 (44.4%) of the patient. All the patients were treated by Marsupialization.

Table 6. Type of Bartholin's disease.

Diagnosis	Frequency	Percentage (%)
Cyst	8	44.4
Abscess	10	55.6
Total	18	100

4. Discussion

The Bartholin's gland are essential organs of the female reproductive system [2]. Cysts and abscesses of the gland are the commonest cystic disease of the vulva and usually arise from obstruc tion of the Bartholin's gland duct and super-infection of the cyst formed due to infection, trauma or congenital narrowing [6] [8] [15]. This incidence makes Bartholin's cyst not a very common condition in gynaecological practice but the commonest vulval cyst in gynaecological practice.

The incidence of Bartholin's gland cyst or abscess from this study was 1.78%. This is similar to the incidence of 2% quoted by other studies [6]-[8] [13] [21] [22]. John *et al.* reported an incidence of 1.4% in Portharcourt while Yuk *et al.* found an incidence of 0.55% and 0.95% respectively for Batholins cysts and abscesses respectively [1] [23]. This lower incidence could be due to their work being done in a different environment. Also, higher health seeking behavior among their population could be an added reason.

Also, the prevalence of STIs has been noted to have reduced in more advanced countries. This could lead to reduced incidence of Bartholins gland abscesses. Our incidence of 1.78 is almost in the range of 1.4% of gynaecological admission got by John *et al.* in Portharcourt, Nigeria [1]. Our incidence being the same with their study could be due to the fact that the study was done in the same environment as both centers are located in Southern Nigeria.

Past history of Bartholin's gland cyst or abscesses being the highest risk factor in our study could be because of the habit of self medication being the first line of management in our third world practice environment. It is most likely that these ladies may have first tried to aspirate or open up the abscess with needle first, only for them to report to the hospital when the drained abscess or cyst had re-accumulated. This history was actually got from some of them.

The 1.78% rate in our study however is actually less than the 36%, 63% gotten respectively by weschter e'tal and figueredo in their own work [6] [7]. This could be due to the fact that their work was done in more advanced environment where healthcare is easily accessible and their patient were unlikely to embark on self medication and less risky sexual behavior.

From our findings, the commonest age at presentation is between 20 - 29 years [3] [21]. From our studies, 11 (61%) of the patients are within the age group of 20 - 30 years with an average age of 28.8 ± 5.6 years. This agrees with the work of John in Porthacourt were 71.1% of his patients fell within the same age group and average age at presentation was 27.74 ± 6.65 years [1]. Shaheen *et al.* also had a similar finding from his study [22]. The average age from this finding is lesser from the findings by Fugueredo *et al.* and Yuk *et al.* whose mean ages were 37.3 ± 9.5 years and 38.1 ± 0.0 years respectively [6] [23]. The higher mean age at presentation from their studies could be due to less frequency of sexual intercourse that could occur with growing older and less trauma like episiotomy at child birth coupled with less risky sexual behaviors associated with developed countries where the studies were done. One common finding with the cited studies is that the disease was commoner among the reproductive age group [1] [6] [22]-[25]. This could be because women of reproductive age group are more likely to engage in sexual activities as well as be at risk of episiotomies which are recognized risk factors.

The commonest risk factor for bartholin's gland cysts or abscesses among our patients was past history of Bartholin's cyst or abscess disease in (77.8%) of cases followed by past or present history of sexually transmitted infection. This is similar to the findings by John *et al.*, Wechter *et al.*, Figueredo where the commonest risk factor was previous history of Bartholins cyst and abscess with 36.8%, 63%, 47.2% respectively [1] [6] [7]. The finding of previous history of Bartholin abscess or cyst could be due to poor health seeking behavior and self-medication which is common with women in developing countries, this is made worse by rampant poverty and high cost of health care.

Our patients presented with varying complaints but the commonest complaint was vulva pain in 77.8%. Fifty five percent had dyspareunia while 22.2% where uncomfortable with the swelling and wanted it removed. This

finding agrees with other studies where pain constituted the commonest presenting symptom [1] [6] [8] [23]-[25]. The reason for this could be because people don't consider Bartholin's gland cyst as distressing until it becomes significantly symptomatic such that it interferes with physical activity. More patients, 55.6% in our study presented with Bartholin's abscess while 44.4% presented with cyst. Although this is not the same as a ratio of 3 is to 1 between abscess and cyst quoted in literatures [3] [8], it is similar to the findings by other scholars [1] [13] [23]. This could be because most Bartholin's cysts are asymptomatic and ignored by patients until it becomes infected to form an abscess and hence painful. In our study, patients with left vulva swelling were 83.3% while right vulva swelling was 16.7%. The reason for this is not clear but John *et al.* also had a similar finding with 71.1% of his patients presenting with left vulva swelling [1].

Diagnosis was clinical while a positive microbial culture was evident in majority of the cases. *Escherichia coli* was the predominant isolate constituting 88.9% of cases and a good number of patients, about 60% had multiple isolates. This is in keeping with the poly-microbial nature of the disease as reported in literatures [1]-[25]. It is different from the work of Bhide *et al.* where the commonest microbial isolates were the coliforms [26]. Four (22.2%) of our patients had *Neisseria gonorrhea* in their isolates. This confirms sexual intercourse as a risk factor for Bartholin's gland cysts and abscesses but is different from the works of Bhide *et al.* who did not isolate *Neisseria gonorrhea* from the microbial culture of their Batholins cysts/abscess isolates [26].

Although there are many treatment modalities for this condition, the best approach is yet to be established [6]. All our patients had Marsupialization, this is the common treatment option available in my centrre. It is also the practice in similar centres as reported by John *et al.* in Portharcourt where all the patients in their study equally had marsupialization [1]. Its attraction in a poor resource setting like ours is because it is cheap, fast, safe and can be performed on an outpatient bases but may require general anaesthesia [1] [11]. It has a low rate of recurrence of between 3% - 6% and minimal complication in good hands [6] [11]. Also reoccurrence rate is low and gland function is preserved. Other novel methods of treatments such as word catheter, Jacobi ring, sclerosants, laser vaporization are also safe and effective with a low rate of recurrence but are not available in a poor resource setting like ours. Although they have a relatively comparative efficacy and safety profile with Marsupialization [1]-[4] [7] [8] [17].

Bartholin's gland cyst or abscess constitute a significant presentation to the Gynaecologists. Adequate knowledge of diagnosis, safe and effective treatment options are a sine qua non to ensure a good quality of life for sufferers.

References

[1] Bhide, A., Nama, V., Patal, S. and Kalu, E. (2010) Microbiology of Cysts/Abscesses of Bartholins Glands: Review of Empirical Antibiotic Therapy against Microbial Culture. *Journal of Obstetrics and Gynaecology*, **30**, 701-703. http://dx.doi.org/10.3109/01443615.2010.505672

[2] John, C.O., Enyinda, C.E. and Okonya, O. (2015) Bartholin's Cyst and Abscesses in a Tertiary Health Facility in Port Harcourt, South-South Nigeria. *Journal of Medical and Biological Science Research*, **1**, 107-111.

[3] Lee, M.Y., Dalpiaz, A., Schwamb, R., Miao, Y., Waltzer, W. and Khan, A. (2014) Clincal Pathology of Bartholin's Glands: A Review of the Literature. *Current Urology*, **8**, 22-25.

[4] Omole, F., Simmons, B. and Hacker, Y. (2003) Management of Bartholins Duct Cyst and Gland Abscess. *American Family Physician*, **68**, 135-140.

[5] Taggart, C. (2013) Bartholinsabcess: Management. Greater Glasgow and Clyde Gynaecology Guidelines.

[6] Saeed, K.N. and Al-Jufauri, Z.A. (2013) Bartholin's Gland Abscesses Caused by *Streptococcus pneumonia* in a Primigravida. *Journal of Laboratory Physicians*, **5**, 130-132. http://dx.doi.org/10.4103/0974-2727.119870

[7] Figueredo, A.C., Duarte, P.E., Gomes, T.P., Borrego, J.M. and Marques, C.A. (2012) Bartholin's Gland Cysts: Management with Carbon-Dioxide Laser Vaporization. *Revista Brasileira de Ginecologia e Obstetrícia*, **34**, 550-554. http://dx.doi.org/10.1590/S0100-72032012001200004

[8] Wechter, M.E., Wu, J.M., Marzano, D. and Haefner, H. (2009) Management of Bartholin Duct Cyst and Abscesses: A Systematic Review. *Obstetrical & Gynecological Survey*, **64**, 395-404. http://dx.doi.org/10.1097/ogx.0b013e31819f9c76

[9] Patil, S., Sultan, A.H. and Thakar, R. (2007) Bartholins Cysts and Abscesses. *Journal of Obstetrics and Gynaecology*, **27**, 241-245. http://dx.doi.org/10.1080/01443610701194762

[10] Kushnir, V.A. and Mosquera, C. (2009) Novel Technique for Management of Bartholin Gland Cysts and Abscesses.

The Journal of Emergency Medicine, **36**, 388-390. http://dx.doi.org/10.1016/j.jemermed.2008.05.019

[11] Balloon Catheter Insertion for Bartholin's Cyst or Abscess: Interventional Procedure Guidance. National Institute for Health and Care Excellence NICE. www.nice.org.uk/guidance/ipg323

[12] Hill, D.S. and Lense, J.J. (1998) Office Management of Bartholin Gland Cysts and Abscesses. *American Family Physician*, **57**, 1611-1616.

[13] Cobellis, P.L., Stradella, L., De Lucia, E., Lannella, I., Pecori, E., Scaffa, C., Cobellis, G. and Colacurci, N. (2006) Alcohol Sclerotherapy: A New Method for Bartholin Gland Cyst Treatment. *Minerva Ginecologica*, **58**, 245-248.

[14] Kafali, H., Yurtseven, S. and Ozardali, I. (2004) Aspiration and Alcohol Sclerotherapy: A Novel Method for Management of Bartholin's Cyst or Abscess. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **112**, 98-101. http://dx.doi.org/10.1016/S0301-2115(03)00241-0

[15] Marzano, D.A. and Haefner, H. (2004) The Bartholin Gland Cyst: Past, Present and Future. *Journal of Lower Genital Tract Disease*, **8**, 195-204. http://dx.doi.org/10.1097/00128360-200407000-00006

[16] Quinn, A. Bartholin Gland Diseases Clinical Presentation. www.emedicine.medscape.com/article/777112-clinical

[17] Moses, S. Bartholin's Gland Duct Abscess. www.fpnotwbook.com/mobile/gyn/vulva/BrthlnsGlndAbscs.htm

[18] Reif, P., Ulrich, D., Bjelic-Radisic, H.M., Schnedl-Lamprecht, E.S. and Tamussino, K. (2015) Management of Bartholin's Cyst and Abscess Using the Word Catheter: Implementation, Recurrence Rates and Costs. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **190**, 81-84. http://dx.doi.org/10.1016/j.ejogrb.2015.04.008

[19] Perry, T.F. Bartholin Gland Marsupialization. www.emedicine.medscape.com/article/1894499-overview#a5

[20] Bogaert, L.V. (1999) Needle Aspiration and Syndromic Management of Bartholin's Abscess. *African Journal of Reproductive Health*, **3**, 103-108. http://dx.doi.org/10.2307/3583234

[21] Umelo, F.U. and Umobong, E.O. (2015) Pyogenic Granuloma of the Vagina: An Unusual Complication of Marsupialization of Bartholin's Cyst. *Journal of Obstetrics and Gynaecology Research*, **2**, 164-169.

[22] Bora, S.A. and Condous, G. (2009) Bartholin's, Vulval and Perineal Abscesses. *Best Practice & Research, Clinical Obstetrics & Gynaecology*, **23**, 661-666. http://dx.doi.org/10.1016/j.bpobgyn.2009.05.002

[23] Shaheen, B., Mary, P. and Vijay, J. (2013) An Unusual Case of a Huge Vulva Swelling. *Brunei International Medical Journal*, **9**, 262-265.

[24] Yuk, J.S., Kim, Y.J., Hur, J.Y. and Shin, J.H. (2013) Incidence of Bartholin's Duct Cysts and Abscesses in the Republic of Korea. *International Journal of Gynecology & Obstetrics*, **122**, 62-64. http://dx.doi.org/10.1016/j.ijgo.2013.02.014

[25] Pipingas, A., Dangor, Y., Radebe, F., Fehler, H.G., Khumalo, S., Gouveia, I.D., *et al*. (2007) Microbiology Investigation of Bartholin's Gland Abscess in Urban Women in Johannesburg. *Southern African Journal of Epidemiology and Infection*, **22**, 18-22.

[26] Bhide, A., Nama, V., Patel, S. and Kalu, E. (2010) Microbiology of Cysts/Abscesses of Bartholins Glands; Review of Empirical Antibiotic Therapy against Microbial Culture. *Journal of Obstetrics and Gynaecology*, **30**, 701-703. http://dx.doi.org/10.3109/01443615.2010.505672