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# Bartholin's gland cysts: management with carbon-dioxide laser vaporization

*Cistos da glândula de Bartholin: tratamento com vaporização laser com CO<sub>2</sub>*

## Artigo Original

### Keywords

Bartholin's gland/therapy  
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### Palavras-chave

Glândula de Bartholin/terapia  
Cistos/terapia  
Terapia a laser  
Laser de gás/uso terapêutico  
Procedimentos cirúrgicos ambulatoriais

### Abstract

**PURPOSE:** To evaluate the effectiveness, recurrence rate, and complications of carbon-dioxide laser vaporization in the treatment of Bartholin's gland cysts. **METHODS:** A retrospective study including 127 patients with symptomatic Bartholin's gland cysts submitted to carbon-dioxide laser vaporization at our institution from January 2005 to June 2011. Patients with Bartholin's gland abscesses and those suspected of having neoplasia were excluded. All procedures were performed in an outpatient setting under local anaesthesia. Clinical records were reviewed for demographic characteristics, anatomic parameters, intraoperative and postoperative complications, and follow-up data. Data were stored and analyzed in Microsoft Excel<sup>®</sup> 2007 software. A descriptive statistical analysis was performed, and its results were expressed as frequency (percentage) or mean±standard deviation. Complication, recurrence, and cure rates were calculated. **RESULTS:** The mean age of the patients was 37.3±9.5 years-old (range from 18 to 61 years-old). Seventy percent (n=85) of them were multiparous. The most common symptom was pain and 47.2% (n=60) of patients had a history of previous medical and/or surgical treatment for Bartholin's gland abscesses. Mean cyst size was 2.7±0.9 cm. There were three (2.4%) cases of minor intraoperative bleeding. Overall, there were 17 (13.4%) recurrences within a mean of 14.6 months (range from 1 to 56 months): ten Bartholin's gland abscesses and seven recurrent cysts requiring reintervention. The cure rate after single laser treatment was 86.6%. Among the five patients with recurrent disease that had a second laser procedure, the cure rate was 100%. **CONCLUSIONS:** At this institution, carbon-dioxide laser vaporization seems to be a safe and effective procedure for the treatment of Bartholin's gland cysts.

### Resumo

**OBJETIVO:** Avaliar a eficácia, a taxa de recorrência e as complicações da vaporização laser com CO<sub>2</sub> no tratamento dos cistos da glândula de Bartholin. **MÉTODOS:** Estudo retrospectivo com 127 pacientes que apresentavam cistos sintomáticos da glândula de Bartholin submetidas à vaporização laser CO<sub>2</sub> na nossa instituição de janeiro de 2005 a junho de 2011. Foram excluídas todas as pacientes com abscessos da glândula de Bartholin ou com suspeita de câncer. Todos os procedimentos foram realizados em regime ambulatorial, sob anestesia local. A coleta dos dados foi feita com base na consulta do processo clínico, tendo-se procedido à análise das características demográficas, dos parâmetros anatômicos, das complicações intra e pós-operatórias e dos dados de acompanhamento. Os dados foram armazenados e analisados no software Microsoft Excel<sup>®</sup> 2007, e os resultados foram apresentados como frequência (porcentagem) ou média±desvio padrão. As taxas de complicações, recorrência e cura foram calculadas. **RESULTADOS:** A idade média das pacientes foi de 37,3±9,5 anos (variando entre 18 e 61 anos). Setenta por cento (n=85) delas eram multiparas. A queixa mais frequente foi dor e 47,2% (n=60) das pacientes tinham antecedentes de tratamento médico e/ou cirúrgico por abscesso da glândula de Bartholin. A dimensão média dos cistos foi de 2,7±0,9 cm. Foram verificados três (2,4%) casos de hemorragia intraoperatória ligeira e 17 (13,4%) recorrências durante um período médio de 14,6 meses (variando entre 1 e 56 meses): dez abscessos da glândula de Bartholin e sete cistos recorrentes, que precisavam de uma nova intervenção cirúrgica. A taxa de cura após um único tratamento à laser foi de 86,6%. Dentre as cinco pacientes com doença recorrente que foram submetidas a um segundo procedimento com laser, a taxa de cura foi de 100%. **CONCLUSÕES:** Na presente instituição, a vaporização laser com CO<sub>2</sub> parece ser uma opção terapêutica segura e eficaz no tratamento dos cistos da glândula de Bartholin.

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Conflict of interest: none.

## Introduction

The obstruction of Bartholin's gland duct as a result of trauma (namely during a mediolateral episiotomy or a posterior colporrhaphy) or of infection leads to cystic enlargement of these glands because of the continued mucus secretion<sup>1,2</sup>. Bartholin's gland cysts are the most common cystic growths occurring in the vulva labia majora, affecting approximately 2% of women, mostly in reproductive years<sup>3</sup>. Although many patients are asymptomatic, Bartholin's gland cysts can be associated with significant discomfort and disruption of the sexual function and daily activities. Most common symptoms include pain, dyspareunia, fullness, and pressure or discomfort when sitting or walking<sup>1</sup>. Definite treatment is required not only to provide relief of symptoms but also to avoid the possibility of recurrent glandular abscesses<sup>4</sup>.

Although there are many treatment modalities available for this condition, the best approach is yet to be established<sup>5</sup>. Conventional treatments, like surgical excision and marsupialization, are still the most commonly used. Complete surgical excision, the first treatment described in 1942 by Catell<sup>1</sup>, requires general/regional anaesthesia and is associated with a complication rate of approximately 24%<sup>3</sup>. Its complications include: haemorrhage, infection of sutures, damage of surrounding structures, cosmetic disfigurement, dyspareunia, and disturbed lubrication of the vagina. Nevertheless, it remains the treatment of choice in two specific situations: recurrent cysts refractory to previous techniques and when there is a suspicion of adenocarcinoma of Bartholin's gland<sup>1,6</sup>. Marsupialization, first described in 1950 by Jacobson<sup>1</sup>, is a surgical alternative to the excision. It can be performed under local anaesthesia and has a lower risk of haemorrhage, scarring, postoperative pain and impaired sexual function, once it preserves the secretory function of Bartholin's glands for lubrication<sup>1,6</sup>. However, it has been associated with higher recurrence rates (from 2 to 25%)<sup>1</sup>.

In the past years, several authors have advocated the use of less-invasive but equally effective techniques for the treatment of this condition, like fistulization using Word catheter, alcohol sclerotherapy, or silver nitrate ablation<sup>7</sup>. Recently, outpatient carbon-dioxide (CO<sub>2</sub>) laser vaporization of Bartholin's gland cysts has emerged as a safe and effective alternative, with several advantages over the conventional treatments. It has become the standard treatment approach of Bartholin's gland cysts in our institution since 2000.

The aim of this retrospective study was to evaluate the effectiveness, recurrence rate, and complications of CO<sub>2</sub> laser vaporization when treating Bartholin's gland cysts.

## Methods

A retrospective study including 127 patients with symptomatic Bartholin's gland cysts submitted to CO<sub>2</sub> laser vaporization at *Maternidade Doutor Alfredo da Costa*, Lisbon, Portugal, from January 2005 through June 2011. Patients with Bartholin's gland abscesses and those with neoplasia suspicion were excluded from the study. It was approved by the Ethics Committee of such Institution.

Clinical records of all patients were reviewed. Data concerning patient's history included: age, parity, contraceptive method, smoking habits, symptoms (pain, dyspareunia, and abnormal vaginal discharge), previous Bartholin's gland abscesses, and previous vulvar surgery. Preoperative assessment included gynecologic examination and vulvoscopy with assessment of location and size of the cyst.

All laser procedures were performed under local anaesthesia in an outpatient setting without the presence of a dedicated anaesthesiologist. We worked with a 50 W CO<sub>2</sub> Laser (Deka, Calenzano, Italy) with a power output of 25 W used in continuous mode, connected to a colposcope (Carl Zeiss, Oberkochen, Germany). The laser beam was guided by a manipulator and had a diameter that ranged from 0.5 to 1.0 mm and a power density from 600 to 1,200 W/cm<sup>2</sup>. A 5 mL solution composed of 1% lidocaine without epinephrine was administered through multiple injections in the skin overlying the cyst. After managing the local anaesthesia, a 1.5 cm longitudinal incision with the laser beam near the place where the cyst wall was closer to the vulvar epithelium was performed. Afterwards, the cyst content was evacuated and a laser vaporization of the cyst capsule was carried out, with a depth of destruction from 2 to 3 mm. Intraoperative and postoperative complications were recorded.

All patients received a seven-day course of Cefradine (1 g tid) postoperatively. Patients were advised to rest during the following week and instructed to return to the unit in case of significant pain or bleeding.

Follow-up visits were scheduled at two and six months after surgery and annually thereafter, where each one included a gynecologic and vulvoscopic examination with assessment of patients' symptoms or complaints (pain, dyspareunia and local paresthesia). Recurrence was defined as the occurrence of a gland cyst or abscess during the follow-up period, requiring new treatment.

Data were stored and analyzed in Microsoft Excel<sup>®</sup> 2007 software. A descriptive statistical analysis was performed and its results were expressed as frequency (percentage) or mean  $\pm$  standard deviation (SD). Complication, recurrence, and cure rates were calculated.

## Results

During the study period, 127 patients were submitted to CO<sub>2</sub> laser vaporization of Bartholin's gland cysts at the mentioned unit.

Patients' characteristics are summarized in Table 1. The mean age was 37.3±9.5 years (range from 18 to 61). Seventy percent (n=85) of patients were multiparous, and hormonal contraception was recorded in 48 of them (37.8%). About one quarter (n=33; 25.9%) of the patients referred smoking habits. Six percent (n=8) of patients had previously undergone vulvar surgery: ipsilateral marsupialization in six cases, contralateral surgical excision in one, and laser vaporization of vulvar acuminate condiloma in one. Nearly half of the patients (n=60; 47.2%) had a history of Bartholin's gland abscesses; of these, 38.3% (n=23) received medical treatment with antibiotics only and 61.7% (n=37) had medical and surgical treatments (simple drainage in 31 cases, marsupialization in five, and partial surgical excision in one). Fifty-nine percent (n=75) of patients referred only vulvar discomfort at the time of the procedure. Pain was the second most common symptom (29/31), followed by dyspareunia (9/31).

The mean cyst size was 2.7±0.9 cm (range from 1.5 to 5.0 cm). The cysts were right-sided in 59 (46.5%) cases and left-sided in 68 (53.5%) ones.

All procedures were performed in an outpatient setting and all patients were discharged home after the treatment. The complication rate observed was 3.19%. There were three (2.4%) cases of minor intraoperative bleeding, easily controlled by haemostatic sutures, and one (0.79%) case of postoperative hematoma, which was drained two days after surgery. No surgical site infections were recorded.

Concerning follow-up data, all patients attended the two-month follow-up examination. The mean duration of the follow-up was 29±21 months (range from 2 to 83 months), as seen in Table 2.

At the first follow-up visit almost all patients (n=115; 90.6%) were symptom free. Six (4.7%) participants referred pain and two (1.6%) of them complained of dyspareunia. Healing was complete with two months in 94.5% (120/127) of patients and after three months in the remaining ones.

Overall, during the follow-up period, there were 17 (13.4%) ipsilateral recurrences requiring retreatment. The mean latency before recurrence was 14.6 months (range from 1 to 56 months). There were ten ipsilateral Bartholin's gland abscesses that required medical and/or surgical treatments and seven recurrent symptomatic

**Table 1.** Baseline characteristics of the patients submitted to CO<sub>2</sub> laser vaporization of Bartholin gland cysts (n=127)

Characteristics	n	%
<b>Age (years)</b>		
Mean±SD	37.3±9.5	
Range	18–61	
<b>Parity</b>		
Nulliparous	42	33.1
Multiparous	85	66.9
<b>Contraceptive method</b>		
None	25	19.7
Hormonal	48	37.8
Non-hormonal	43	33.9
<b>Smoking habits</b>	33	25.9
<b>Previous vulvar surgery</b>	8	6.3
<b>Previous gland abscess</b>	60	47.2

SD: standard deviation.

**Table 2.** Follow-up data of patients submitted to CO<sub>2</sub> laser vaporization of Bartholin gland cysts

Follow-up time	Number of patients followed		Number of recurrences	
	n	%	n	%
<6 months	18	14.2	7	5.4
6–12 months	9	7.1	3	2.4
12–24 months	33	26	2	1.6
24–48 months	40	31.5	3	2.4
>48 months	27	21.2	2	1.6
<b>Total</b>	<b>127</b>	<b>100</b>	<b>17</b>	<b>13.4</b>

cysts. Of these patients, five were submitted to a second outpatient laser vaporization procedure at our institution, with successful results in all cases. Two patients went under surgery again in other hospitals: one had a surgical excision and the other one a marsupialization. Both became asymptomatic after these procedures.

The cure rate after a single laser treatment was 86.6% (110/127). Among the five patients with recurrent disease, who had a second laser procedure, the cure rate was 100% (5/5).

## Discussion

Bartholin's gland cysts account for 2% of all gynecologic visits per year<sup>1</sup>. Despite being a common condition, controversy remains on which therapeutic modality should be considered the golden-standard of treatment. Conventional techniques, like excision or marsupialization, have a low recurrence rate but usually require general anaesthesia and are associated with haemorrhage, infection, delayed scarring, and dyspareunia. Other less invasive and cost-effective alternatives have been developed.

Some authors advocate the use of the Word catheter, which is a safe and effective method (with recurrence rates of only 3%), but that requires patients to return at least twice for completing the treatment<sup>3,4</sup>. Other main disadvantages of this approach are that the catheter may be irritating and often dislodges or falls out before the tract is epithelialized.

Another approach is the cyst capsule destruction with silver nitrate or alcohol. Both are fast outpatient procedures performed under local anaesthesia, but with common adverse effects. Silver nitrate ablation is frequently associated with chemical vulvar burning and labial edema. Alcohol sclerotherapy can lead to transient hyperemia, hematoma, tissue necrosis, and scarring<sup>1,5</sup>. A prospective randomized study published in 2009<sup>6</sup> aimed at comparing the efficacy of marsupialization and silver nitrate in the treatment of 212 patients with symptomatic Bartholin's gland cysts. The authors concluded that both treatment modalities seem to be equally effective, with similar recurrence rates, although silver nitrate favours complete healing with less scar formation ( $p=0.007$ ).

Recently, outpatient CO<sub>2</sub> laser vaporization of Bartholin's gland cysts has emerged as a safe and effective alternative technique. It was first described by Davis<sup>7</sup> in 1985, who used laser to create a 1.5 cm neostoma that extended from the vulvar skin to the cystic cavity. Twelve (86%) of the 14 treated patients required only one treatment (recurrence rate – 14.3%). Most patients experienced minimal discomfort during and after the procedure, with no significant long-term morbidity. Other recent published studies corroborate the safety and efficacy of CO<sub>2</sub> laser vaporization. In 2002, Penna et al.<sup>8</sup> reported a case control retrospective cohort on 111 patients treated either by laser vaporization or laser excision. Both treatment modalities showed low recurrence (1.8%) and complication (4.5%) rates, although laser excision was associated with longer surgery time and higher patient discomfort. Panici et al.<sup>3</sup> published a prospective observational study of a series of 19 patients submitted to a minimally invasive procedure, consisting of a single drainage with a CO<sub>2</sub> laser used to create a new stoma on the original duct orifice. The procedure had a 10.5% of recurrence rate, with minimum intra and postoperative patient discomfort and high patient satisfaction. Similar results were observed by de Góis Speck et al.<sup>9</sup>, in 2007. Of the 22 patients submitted to laser vaporization, only two

had relapses both solved using a second procedure. The average surgery time was short, without bleeding during the operation and complete epithelization was achieved within a maximum four-week span.

Fambrini et al.<sup>4</sup> reported in 2008 the largest case series on laser vaporization of Bartholin's gland cysts. In this retrospective analysis of 200 patients, there were nine (4.3%) cases of recurrent disease, with a minimal complication rate (1.5%). The cure rate after a single laser treatment was 95.7% and repetition of the laser procedure was effective in all recurrent cases. A systematic review of literature published in 2009<sup>5</sup> aimed at evaluating the recurrence, healing time, and complications of different treatments for Bartholin's gland cysts or abscesses. The authors concluded that all of the available treatments are associated with low recurrence rates (less than 20%), rapid healing (in two weeks or less), and uncommon non-life threatening adverse events. Nevertheless, this review failed to identify the best treatment approach for this condition according to the current literature.

In the present study, we retrospectively analysed 127 cases of Bartholin's gland cyst managed by CO<sub>2</sub> laser vaporization. All procedures were completed in an outpatient basis, with low intraoperative and post-operative complication rates. Follow-up data revealed a recurrence rate of 13.4% during an average time of 29±21 months. The cure rate after a single laser treatment was of 86.6%. Among the patients with recurrent disease that had a second laser procedure, cure rate was 100%.

The higher recurrence rate observed in this study comparatively to other reports can be, in part, explained by the presence of unrecognized multiloculated cysts, one of the most common causes of relapsing disease because of the difficulty of achieving complete evacuation. On the other hand, it can also be attributed to the fact that the procedures were performed by different surgeons, and one must not forget the impact of the long learning curve on the follow-up data. Although laser CO<sub>2</sub> is used in our institution since 1980, this type of surgical procedure started only in 2004, which can account for the higher recurrence rate observed.

This study has some limitations. To start, the retrospective nature of the study may lead to a lower accuracy of the data, although information has been collected by a single investigator. On the other hand, the different follow-up duration can have biased the recurrence rate seen.

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