Case Report

Combination of surgery and laser for the treatment of extensive VIN3 and vulval condyloma: A case report

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ABSTRACT

Introduction and importance: Vulval intraepithelial neoplastic lesions (VINs) are rare lesions that appear with limited signs of pre-malignancy restricted to the vulvar epithelium. One of the principal causes of VINs is the human papillomavirus (HPV) infection, especially in people with weakened immune systems and young women. Case presentation: A 35-year-old woman presented with VIN3 who had severe immunosuppression and was under corticosteroid treatment. Her lesions were treated with a laser and surgical excision. Clinical discussion: Pathological findings indicated full thickness dysplasia and HPV infection. Follow-up after 5 years showed complete recovery and no recurrence, with a restoration of the vulva esthetics. Conclusion: Due to the increasing prevalence of VIN malignancy in young women and the importance of maintaining normal anatomy and function of the genitalia, a combination of surgery and laser can be used instead of extensive surgery only.

1. Introduction

Vulval intraepithelial neoplastic lesions (VIN) are rare lesions that appear with limited signs of malignancy restricted to the epithelium of the vulva. Human papillomavirus (HPV) infection is among the principal causes of VIN, especially in immunocompromised individuals. Its prevalence is unknown, but in the United States it is reported to be about 3.3%–3.5% [1] and 1.2%–2.1% globally per 100,000 women [2]. Its prevalence and vulvar carcinoma in Iran are also unknown [3] and recorded evidence indicated that global vaccination will steadily reduce the prevalence of VIN [4]. Conventionally, the VIN is divided into three degrees (like cervical intraepithelial neoplasia-CIN) as VIN1, VIN2, and VIN3. However, the International Society for the Study of Vulvovaginal Disease (ISSVD) reclassified VIN into two types; the usual type or uVIN (linked to basaaloid, warty, and mixed), and the differentiated type (dVIN). The uVIN is prevalent in young women whereas the dVIN regularly allied with carcinoma, and closely related to lichen sclerosus and vulvar dermatosus is common in postmenopausal women [5]. Symptoms include agonizing intercourse, pruritus, burning urination, palpable lesions that are often multifocal and white, red, gray or brown.

Colposcopy examination is recommended for all post-menopausal women. Women with genital warts who do not respond to topical treatment should perform a biopsy. Common treatments include wide local excision which removes 0.5–1cm of visible tissue around the lesion, and may injure the clitoris, urethra, and anus. The advantage of this method over ablation and drug therapy methods is the possibility to perform histopathological examination of the tissue [5,6].

2. Method

This case was reported in line with the consensus-based Surgical Case Report (SCARE) guidelines [7].

3. Case presentation

A 35-year-old single and nulligravid woman consulted who had been diabetic since she was 17 years and was under insulin therapy. Since the age of 23, had suffered hepatic sarcoidosis and had been receiving corticosteroid treatment. She was also treated with levothyroxine due to severe hypothyroidism. From the age of 32, she noticed genital lesions that were initially neglected, but which disseminated covering the entire...
vulva over time (October 18, 2016). As a result, the patient consulted with a doctor and underwent biopsy and vulvoscopy. The diagnosis of VIN3 and HPV type 16 biopsies were positive. Hence, radical vulvectomy was recommended, but the patient was noncompliant considering her age and desire to maintain the normal anatomy and genitalia esthetics. Due to the spread of condyloma lesions around the vulva, she decided to perform a wide local excision-combined operation using laser cutting (25w, continuous) and laser ablation. The lesions were pulsed (pulse-12w, frequency 50) employing a smart x side 2 laser device from Deca company. The most common VIN 3 treatment method is wide local cold-knife excision surgery. However, in this patient, the incision was made using a laser and the large condyloma lesions were destroyed by the laser before the surgical excision. The excised tissue was examined pathologically for carcinoma diagnosis and was reported in three edges without conflict, and only in the edge margin leading to the anus. The anal regional and more distal lesions were ablated using a CO₂ laser (pulse-12w, frequency 50). The incision site following the deep laser subcutaneous tissue was sutured in two layers using 4-0 Monocryl thread (Fig. 1).

Post-operation pain was relieved through intravenous antibiotics, painkillers, and ice bags intervention from the first to the third week (November 7–23, 2016). Cognizance of the patient’s compromised health status, the laser was employed both as a scalpel and ablation providing the definitive treatment of the condyloma and VIN. Five months post-operation (March 7, 2017), complete recovery had been achieved with no indication of recurrence (Fig. 2).

4. Clinical discussion

VIN is a dermal condition in which the cells on the surface covering the vulvar undergo abnormal changes. The VIN is not a cancerous lesion, but can become cancerous over time [8]. For VIN2, it is imperative to

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**Abbreviations**

| CIN | cervical intraepithelial neoplasia |
|-----|-----------------------------------|
| VIN | vulvar intraepithelial neoplastic lesion |
| HPV | human papillomavirus infection |

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**Fig. 1.** VIN presentation and medical intervention

A) Dispersion of condyloma lesions in the genitalia including the vulva B) Laser assisted incision of condyloma lesions around the vaginal area and excision of affected area C) Sutured wound post-operation site D) Post operation recovery after three weeks of medication.

**Fig. 2.** Five months post-operation complete recovery and restoration of genitalia esthetics with no indication of recurrence.
perform treatment to prevent the progression to cancer. The treatment type depends on the location of the lesion, the symptoms, and the risk factors for cancer. The wide local excision procedure should be performed in all women with the common type since the risk is high. But if the probability of carcinoma development is low, excision, laser, or drugs like imiquimod 5% can be used. Until recently, surgery was the most common treatment for patients with VIN, but due to physical and psychological side effects, alternative methods have received more attention [5,6,8]. In one study, the probability of recurrence in the combined method of partial resection of vulvar tissue with ablation by laser was lower (6.25%) than partial vulvectomy alone (50%) or laser alone (70%). Another large study recommended the use of lasers to destroy VIN lesions. However, it is recommended to consider risk factors for recurrence, including a previous history of VIN, age, and type 16 HPV infections [9,10]. Laser vaporization was more effective in vulvo-comestic restoration than laser excision but lacked examinable tissue unlike laser excision that produced tissue that could be examined for invasion [11]. Although surgical procedures ensure total lesion removal and low recurrence, the increasing prevalence in young women and their need for vulvo-comestic and functional preservation prioritizes less invasive applications. A combination of surgery for single lesions and laser for multifocal lesions, achieved elimination of the disease in 71% of the women [12]. In the cases that involved surgical and non-surgical treatment, especially in patients with HPV infection and multiple lesions, the risk of recurrence was high for surgical intervention, while non-surgical treatment produced complete convalescence [11,13,14]. In the laser incision of tissue, while the amount of bleeding during and after the operation was less than the incision employing cold-knife, the recurrence rate in the use of the laser was less than that of the surgical blade. This was probably due to the closure of lymph vessels and cell destruction in the tissue margin by the laser treatment [13-15]. Resultantly, in our patient, even the incision was laser-executed (25w, continuous). Finally, due to the increase in HPV infection and thus increase in the prevalence of VIN in young women who are sexually active, maintaining the function and appearance of the genital area is a priority and a follow-up is mandatory regardless of the therapy method [16]. The use of alternative methods of extensive surgery such as combined surgical and laser ablation to preserve more tissue is particularly important. More studies are needed to find treatments that can further maintain function and restore genital esthetics, especially as the disease is more prevalent in young women.

5. Pathological results

5.1. Clinical data

A) Right vulva resection with the frozen section.
B) Left vulva resection with the frozen section.

Known case of VIN2 and VIN3.

Frozen section DX = Deep margin = free, lateral margin, low grade dysplasia at 6 O’clock.

Main lesion = High grade dysplasia.

Macroscopic information:
The specimens received in fresh status consist of:

A) A creamy soft tissue M:5.5 × 3 × 1cm. The external surface shows some wart lesion M/3.
1) Frozen 3, 6, and 9 O’clock 2) 12 O’clock 3) other areas
B) A creamy soft tissue M:4x2.5 × 1cm. The external surface shows some wart lesions M/3.
1) Frozen 3, 6, and 9 O’clock 2) 12 O’clock 3) other areas

6. Microscopic information

Microscopic images were obtained from the right and left vulvectomy sections demonstrating full thickness dysplasia, supported by the following diagnosis;

7. Diagnosis

A) RIGH'T VULVECTOMY WITH FROZEN & PERMANENT SECTION:
- Low- and high-grade squamous dysplasia in multiple areas from 3, 6, 9, and 12 O’clock (size 5.5cm).
- Margin is free.
- No SCC or invasion seen.

B) LEFT VULVECTOMY WITH FROZEN & PERMANENT SECTION:
- High-grade squamous dysplasia at 3, 6, 9, and 12 O’clock.
- At 6 O’clock, margin shows low grade dysplasia.
- Negative for SCC or invasive component.

Full thickness dysplasia & koilocytosis indicating HPV infection and VIN2, and VIN3, were features in the vulvar epithelium (Fig. 3).

8. Conclusion

Due to the increasing prevalence of VIN malignancy in young women and the importance of maintaining normal anatomy and normal function, a combination of surgery and laser can be used instead of extensive surgery.

Ethical approval

This study was approved by the ethical committee of Preventive and Gynaecology Research Center (PGRC) Shahid Beheshti University of Medical Sciences with approval number (IR.SBMU.RETECH.REC.1400.171).

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Author contribution

All authors contributed equally in performing the research and in drafting the manuscript. Farah Farzaneh: surgical operation, drug dispensation, manuscript drafting. Leila Khalili: surgical operation, suturing, manuscript drafting. Nasser Rakhshani: pathology report, microscopic imaging, manuscript drafting. Faramarz Beyraghdar: laser operation, manuscript drafting. Afsaneh Hosseini: study design, data interpretation, general coordination, manuscript drafting and editing.

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these categories then this should be stated.

Consent

Studies on patients or volunteers require ethics committee approval and fully informed written consent which should be documented in the paper. Authors must obtain written and signed consent to publish a case report from the patient (or, where applicable, the patient’s guardian or next of kin) prior to submission. We ask Authors to confirm as part of the submission process that such consent has been obtained, and the manuscript must include a statement to this effect in a consent section at the end of the manuscript, as follows: ‘Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request’.

Patients have a right to privacy. Patients’ and volunteers’ names, initials, or hospital numbers should not be used unless the information is essential for scientific purposes and explicit permission has been given as part of the consent. If such consent is made subject to any conditions, the Editor in Chief must be made aware of all such conditions.

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The patient approved and signed an informed consent for publication including images.

Declaration of competing interest

The authors declare that they have no conflict of interest either financial or otherwise.

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