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Acuminated condyloma in the neovagina of a patient with Mayer–Rokitansky–Küster–Hauser Syndrome: a case report

Condiloma acuminado em neovagina de paciente com Síndrome de Mayer–Rokitansky–Küster–Hauser: relato de caso

Condiloma acuminado en neovagina de paciente con Síndrome de Mayer–Rokitansky–Küster–Hauser: informe de caso

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ABSTRACT

Objective: To describe the successful therapeutic management of acuminated condyloma in the neovagina of a patient with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome using CO_2 laser vaporization. **Case details:** A 24-year-old cisgender, heterosexual woman with a history of type I MRKH syndrome had previously undergone vaginal dilation therapy, achieving a total vaginal length of 7 cm. She was admitted to a Lower Genital Tract Pathology clinic with complaints of deep dyspareunia and postcoital bleeding. On examination, condylomatous lesions were observed on the vulva and neovagina—biopsied and histopathologically confirmed as condyloma acuminatum. CO_2 laser vaporization (SmartXide Touch®, 10W, continuous mode) was selected as the treatment. Seven days after the procedure, the patient showed satisfactory healing, and after four months, she was asymptomatic with no clinical evidence of recurrence. **Final considerations:** This case reinforces the usefulness of CO_2 laser therapy in the treatment of condyloma acuminatum in neovaginal tissue, contributing to the management of gynecological conditions in reconstructed vaginal anatomies.

Keywords: Condylomata acuminata, Papilloma virus infections, Lasers, Gas, Vagina.

RESUMO

Objetivo: Descrever a condução terapêutica bem-sucedida de condiloma acuminado em neovagina em paciente com síndrome de Mayer-Rokitansky-Küster-Hauser (MRKH), utilizando vaporização com laser de CO_2. **Detalhamento do caso:** Mulher cisgênero, heterossexual, 24 anos, com histórico de síndrome de MRKH tipo I, tratada com dilatadores vaginais, alcançando 7 cm de comprimento total da vagina. Foi admitida em ambulatório de Patologia do Trato Genital Inferior com queixas de dispareunia de profundidade e sinusorragia. Ao exame, observavam-se lesões condilomatosas em vulva e neovagina - alvos de biópsia - com confirmação anatomopatológica de condiloma acuminado. Optou-se pela vaporização das lesões com laser de CO_2 (SmartXide Touch®, 10W, modo contínuo). Após sete dias do procedimento, a paciente já apresentava cicatrização satisfatória e, aos quatro meses, já não havia mais sintomas nem evidências clínicas de recidiva. **Considerações finais:** Este caso reforça a utilidade da terapia com laser de CO_2 no

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tratamento de condiloma acuminado em neovagina, contribuindo para o manejo de condições ginecológicas em anatomias vaginais reconstruídas.

Palavras-chave: Condiloma acuminado, Infecções por papillomavirus, Lasers de gas, Vagina.

RESUMEN

Objetivo: Describir el manejo terapéutico exitoso del condiloma acuminado en la neovagina de una paciente con síndrome de Mayer-Rokitansky-Küster-Hauser (MRKH), mediante vaporización con láser de CO_2. **Detalles del caso:** Mujer cisgénero, heterosexual, de 24 años, con antecedente de síndrome de MRKH tipo I, tratada previamente con dilatación vaginal, alcanzando una longitud total de 7 cm. Fue atendida en un ambulatorio de Patología del Tracto Genital Inferior con quejas de dispareunia de profundidad y sinusorragia. Al examen físico se observaron lesiones condilomatosas en vulva y neovagina, las cuales fueron biopsiadas y confirmadas como condiloma acuminado mediante análisis histopatológico. Se optó por vaporización con láser de CO_2 (SmartXideTouch®, 10W, modo continuo). A los siete días del procedimiento, la paciente presentaba cicatrización satisfactoria y, a los cuatro meses, estaba asintomática y sin evidencia clínica de recurrencia. **Consideraciones finales:** Este caso refuerza la utilidad del tratamiento con láser de CO_2 para condiloma acuminado en neovagina, aportando al manejo de condiciones ginecológicas en anatomías vaginales reconstruidas.

Palabras clave: Condiloma acuminado, Infecciones por papillomavirus, Láseres de gas, Vagina.

INTRODUCTION

Müllerian aplasia, more commonly referred to as Mayer–Rokitansky–Küster–Hauser (MRKH) syndrome, is a rare congenital malformation characterized by the complete absence or severe hypoplasia of the uterus and the upper portion of the vagina, while preserving normal ovarian function and the typical development of secondary sexual characteristics (CHEN N, et al., 2022; HELLER DS, 2015). The condition results from incomplete development of the paired Müllerian ducts during early embryogenesis, while the gonads—derived from a distinct embryologic origin—remain unaffected (CHEN N, et al., 2022). As a consequence, affected individuals generally present in adolescence with primary amenorrhea despite otherwise normal pubertal progression and hormone profiles (CHEN N, et al., 2022; AITTOMÄKI K, et al., 2001).

Epidemiological estimates suggest that MRKH occurs in approximately 1 in 5,000 live female births, although rates may vary according to population-based data and diagnostic practices (AITTOMÄKI K, et al., 2001). Two main subtypes have been described: type I, or the isolated form, which involves only uterovaginal agenesis without other organ malformations, and type II, which is associated with additional anomalies—most commonly renal and skeletal malformations, and less frequently auditory defects. Because external genitalia and secondary sexual traits are unaffected, diagnosis is often delayed until evaluation for amenorrhea reveals the underlying structural anomalies (CHEN N, et al., 2022).

A comprehensive diagnostic work-up for MRKH includes detailed clinical history, physical examination, and imaging—typically magnetic resonance imaging or pelvic ultrasound—to confirm the absence or hypoplasia of Müllerian structures while documenting the presence of normal ovaries (CHEN N, et al., 2022). Beyond the anatomic diagnosis, the condition carries significant emotional and psychosocial implications, as patients often face complex challenges related to identity, fertility, and intimate relationships. Early recognition of these broader aspects is essential for implementing a multidisciplinary approach to care from the outset (HELLER DS, 2015).

The creation of a functional neovagina is a central aspect of clinical management in MRKH patients, aiming to enable satisfactory sexual intercourse and improve quality of life, with available approaches including nonsurgical dilation and various surgical techniques (KÖLLE A, et al., 2019; RALL KK, et al., 2019). Nonsurgical progressive self-dilation remains the recommended first-line therapy, involving the repeated use of dilators of increasing diameter applied to the vaginal dimple over several months. This method avoids

operative risks and, when effective, produces a neovagina lined by non-keratinized squamous epithelium, closely resembling native vaginal mucosa. However, continued or intermittent dilation is frequently required to preserve length and patency (KÖLLE A, et al., 2019).

Several surgical alternatives are available for patients in whom dilation fails or is not feasible. The McIndoe technique establishes a neovaginal canal in the vesicorectal space and covers it with a split-thickness skin graft. Although this graft loses some adnexal elements, such as glands and follicles, it retains keratinized epithelial features distinct from native vaginal lining (HELLER DS, 2015; KÖLLE A, et al., 2019). Another well-established approach is the Davydov procedure, which mobilizes peritoneal tissue from the pouch of Douglas into the newly created canal. Under hormonal influence, this peritoneal surface undergoes squamous metaplasia, resulting in a mucosa with histological characteristics more similar to the vaginal epithelium (KÖLLE A, et al., 2019). Intestinal vaginoplasty, most often using a segment of sigmoid colon, provides a lumen naturally lubricated by intestinal mucosa. While this technique offers functional benefits, it also carries specific risks, including excessive mucus production and gastrointestinal complications (HELLER DS, 2015; KÖLLE A, et al., 2019).

Procedures that avoid grafting have also been described. The Wharton–Sheares–George technique involves blunt dissection of the vesicorectal space followed by postoperative use of a vaginal mold, allowing epithelialization to occur from surrounding tissues. A major limitation of this approach is the frequent requirement for long-term dilation to prevent canal narrowing (KÖLLE A, et al., 2019). In contrast, the laparoscopic Vecchietti method uses intra-abdominal traction to gradually expand the vaginal dimple with the aid of a traction device. Over time, the resulting canal becomes covered by glycogen-rich, non-keratinized squamous epithelium, supporting a physiologic vaginal microbiota and pH, and providing structural and functional features comparable to those of native vaginal tissue (HELLER DS, 2015; KÖLLE A, et al., 2019).

Beyond the MRKH population, it is also necessary to consider transgender women in the context of vaginoplasty. In this group, the most common technique for creating a neovagina is penile inversion, which uses penile and scrotal skin but results in keratinized epithelium and often requires lifelong dilation. Alternatives include skin grafts, peritoneal tissue, or intestinal segments, with intestinal vaginoplasty providing lubrication but carrying risks such as mucus overproduction (WERNEBURG GT e FASCELLI M, 2024; CORNELISSE VJ, et al., 2017).

Patients with surgically created neovaginas are vulnerable to sexually transmitted infections, including HPV. In a prospective study of MRKH women who underwent laparoscopic Vecchietti vaginoplasty, HPV prevalence rates after initiation of sexual activity were comparable to those reported in the general population, and the spectrum of HPV genotypes mirrored that of unaffected women (RALL KK, et al., 2019). Importantly, HPV-related lesions such as condylomas and intraepithelial neoplasia have also been reported in neovaginal and vulvar tissues of MRKH patients, indicating that reconstructed tissue can undergo the same oncogenic processes observed in native epithelium (FREGA A, et al., 2011; HELLER DS, 2015). Transgender women with surgically constructed neovaginas represent an additional population at risk, as they are similarly susceptible to HPV and other sexually transmitted infections (CORNELISSE VJ, et al., 2017 MATSUKI S, et al., 2015).

HPV is a small, non-enveloped DNA virus with tropism for epithelial cells. More than 200 HPV types have been identified and are classified as either high or low-oncogenic risk. Infection occurs when viral particles penetrate basal epithelial cells through microabrasions, particularly in transitional zones such as the cervix and anus. The persistence of HPV is largely driven by the actions of E6 and E7 oncoproteins, which disrupt key tumor suppressor pathways involving p53 and pRb, thereby promoting uncontrolled cell proliferation, evasion of apoptosis, and the accumulation of mutations. These mechanisms, together with the local immune response and environmental factors, determine whether the infection will be transient or progress to precursor lesions and, eventually, cancer. Genital condylomas are consistently associated with low-risk HPV types, such as 6 and 11, and are considered benign lesions with minimal malignant transformation potential (LEON-GOMEZ P e ROMERO VI, 2025; KAZLAUSKAITĖ J, et al., 2025; DOORBAR J, et al., 2012).

The composition of the vaginal microbiota is a critical determinant in the course of HPV infection. Environments dominated by Lactobacillus, particularly L. crispatus, maintain a low pH and preserve the epithelial barrier, favoring viral clearance. In contrast, dysbiotic states characterized by a reduction of lactobacilli and an overgrowth of anaerobes such as Gardnerella, Prevotella, Sneathia, and Megasphaera create an inflammatory microenvironment that promotes viral persistence and progression to dysplasia (KAZLAUSKAITĖ J, et al., 2025 LEON-GOMEZ P e ROMERO VI, 2025).

Among the available therapeutic modalities for HPV-induced genital lesions, CO_2 laser ablation stands out due to its precision and safety profile. The technology operates by producing highly focused energy that enables layer-by-layer vaporization of affected tissue with controlled depth of penetration. This minimizes collateral injury, ensures effective hemostasis, and reduces intraoperative bleeding. As a result, CO_2 laser treatment not only achieves reliable clearance of condylomatous lesions but also promotes rapid healing and lowers recurrence rates (BELLINA JH, 1984; FUSELIER JR, et al., 1980; CALKINS JW, et al., 1982). Clinical studies have documented its successful application in vulvovaginal, perineal, and anal lesions, emphasizing surgical precision and durability of outcomes (CAGLAR H, et al., 1987; RUFFIEUX C, et al., 1990; REGA A, et al., 2002; DE LIMA JR, et al., 2015; ELFALLAL AH, et al., 2022).

Given its precision and tissue-sparing properties, CO_2 laser therapy represents a valuable option for managing HPV-related disease in neovaginal tissue. Although the amount of patients with neovagina remains low and evidence-based treatment protocols for associated conditions such as condyloma acuminatum are scarce, this modality offers an effective approach for lesion eradication while preserving surrounding structures (RALL KK, et al., 2019; FREGA A, et al., 2011; HELLER DS, 2015).

This report presents a case of anogenital condylomatosis in a patient with MRKH syndrome who was successfully treated with CO_2 laser therapy. The goal is to contribute to the limited literature on this topic and support the refinement of therapeutic strategies in this patient population.

CASE DETAIL

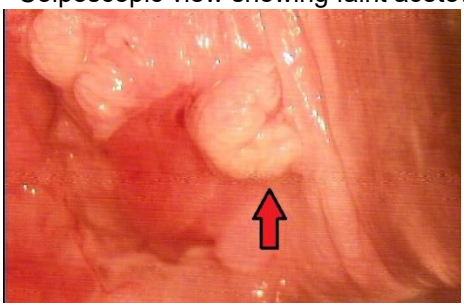
This is a retrospective case report based on the review of electronic medical records and analysis of relevant scientific literature. Clinical, imaging, and histopathological data were collected and organized to describe diagnostic findings, therapeutic approach, and follow-up outcomes. The patient provided written informed consent for the use of her clinical information and images for publication. The study was approved by the Institutional Research Ethics Committee under CAAE 74390323.2.0000.5505, opinion number 6.613.711, accordance with national and international ethical guidelines for research involving human subjects.

A 24-year-old cisgender, heterosexual woman presented with a history of vaginal and oral sexual activity and reported seven lifetime sexual partners. She had been diagnosed with MRKH syndrome (Type I) at age 20 following evaluation for primary amenorrhea. No other comorbidities were identified.

The patient initially sought consultation at the urogynecology clinic due to dyspareunia and difficulty with vaginal penetration. Pelvic magnetic resonance imaging revealed the absence of the uterus, cervix, and upper vagina, with normal ovarian anatomy. Physical examination showed secondary sexual characteristics consistent with her age, and her external genitalia was phenotypically female. Her total vaginal length (TVL) was initially 1.5 cm. She underwent neovaginal dilation therapy, ultimately achieving a TVL of 7 cm.

At age 23, she was referred to a specialized lower genital tract pathology clinic due to postcoital bleeding, deep dyspareunia, and the presence of verrucous lesions on the vulva and neovagina. On clinical examination, condylomatous lesions were observed in the perineal region and posterior commissure. Colposcopic evaluation revealed multiple lesions (up to 1 cm) on the vaginal vault, exhibiting faint acetowhitening and a papillomatous surface with negative iodine staining (**Figures 1** and **2**).

Figure 1 - Colposcopic view showing faint acetowhitening



Source: Maria GCQ, et al., 2025.

Figure 2 - Ppillomatous surface with negative iodine uptake

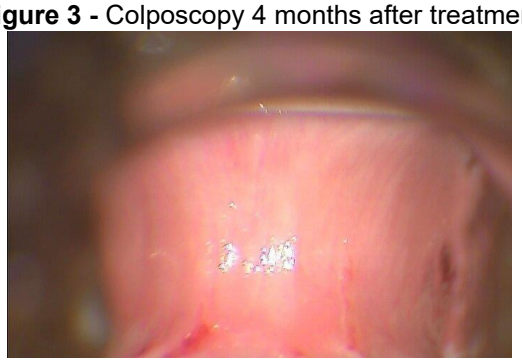


Source: Maria GCQ, et al., 2025.

An excisional biopsy of the largest lesion confirmed a low-grade squamous intraepithelial lesion consistent with condyloma acuminatum. A second biopsy from an erosive site showed non-atypical stratified squamous epithelium with a reactive myogenic granuloma. Vaginal cytology was negative for malignancy.

Given these findings, CO_2 laser vaporization was selected as the treatment modality. A SmartXide Touch laser system (Florence, Italy; Deka, 2014) was used in continuous mode with 10-W power under local anesthesia. The procedure was completed without complications.At the 7-day follow-up, the patient exhibited clear vaginal discharge and granulation tissue at the laser-treated sites. The vulvar lesions had healed into scarred papules, and the patient was asymptomatic. At 4 months posttreatment, symptoms of postcoital bleeding and dyspareunia had resolved. Clinical examination demonstrated a mature squamous epithelium with no evidence of recurrent lesions (**Figure 3**).

Figure 3 - Colposcopy 4 months after treatment



Source: Maria GCQ, et al., 2025.

DISCUSSION

The treatment of condyloma acuminatum in neovagina represents a clinical challenge, mainly due to the rarity of this condition and the scarcity of literature data to guide appropriate management. Population-based studies show that the incidence of Müllerian agenesis, although low, is not insignificant, and that affected individuals experience significant impairment in quality of life (KÖLLE A, et al., 2019; AITTOMÄKI K, et al., 2001). In parallel, it is necessary to consider transgender patients who have undergone vaginal

reconstruction, which makes the topic even more relevant, as it increases the number of individuals with neovaginas and the diversity of surgical techniques and epithelia employed (WERNEBURG GT e FASCELLI M, 2024; CORNELISSE VJ, et al., 2017).

There are multiple possibilities for neovagina construction, ranging from nonsurgical methods such as progressive vaginal dilation to surgical techniques involving the use of peritoneum, intestinal segments, skin grafts, and, in transgender populations, penile inversion (KÖLLE A, et al., 2019; CORNELISSE V, et al., 2017). Each modality entails distinct histological and physiological characteristics that may influence HPV infection dynamics and lesion development, including condylomas (RALL KK, et al., 2019; MATSUKI S, et al., 2015).

Although condylomas are not considered precursor lesions for malignancy, their presence, aside from potential symptoms, indicates HPV exposure and therefore the possibility of coexistence with high-risk oncogenic genotypes (DOORBAR J, et al., 2012; FREGA A, et al., 2011;). For this reason, systematic gynecological follow-up in patients with neovaginas is of great importance (CHEN N, et al., 2022; JOKIMAA V, et al., 2020; CORNELISSE V, et al., 2017; MATSUKI S, et al., 2015).

The use of CO_2 laser therapy in the management of HPV-induced lesions is extensively documented and recognized as both effective and safe in a wide variety of anatomical contexts. From classic studies such as those by Bellina JH (1984) and Calkins JW, et al. (1982) to more recent analyses, there is consensus regarding its selective vaporization capacity, adequate hemostasis, and tissue preservation (BELLINA JH, 1984; CALKINS JW, et al., 1982). Spörri S, et al. (1996) emphasized the precision and the low complication rate of this method, supporting its role as an important therapeutic option. In urological and anorectal settings, systematic investigations have also confirmed the efficacy of CO_2 laser (ELFALLAL AH, et al., 2022; DE LIMA TM, et al., 2015; MATSUKI S, et al., 2015). In gynecology, studies demonstrate satisfactory outcomes both for condylomas and intraepithelial neoplasias, though recurrence rates vary between 20–30%, depending on the population studied and the extent of the lesions (AYNAUD O, et al., 1996; CARROZZA PM, et al., 2002).

Particularly relevant is the application of CO_2 laser therapy in non-native epithelia. Reports of its efficacy in vulvar and penile tissue indirectly support its potential applicability in neovaginas reconstructed with intestinal or penile tissue (CARROZZA PM, et al., 2002; SPÖRRI S, et al., 1996). Moreover, direct clinical experience has also been documented, with favorable responses to CO_2 laser therapy reported in neovaginas of transgender women following penile inversion and in MRKH patients with surgically created neovaginas (MATSUKI S, et al., 2015; FREGA A, et al., 2011). Although the overall literature on condylomas in neovaginas remains limited, these findings reinforce the feasibility of extending established therapeutic modalities to reconstructed vaginal epithelia. In cases where neovagina construction was achieved through progressive dilation, as in the present report, the histological similarity to native vaginal epithelium provides reassurance regarding the safety of applying CO_2 laser treatment.

Another critical aspect is the need for long-term follow-up. Recurrences after laser therapy are more frequent in the first months (AYNAUD O, et al., 1996; CARROZZA PM, et al., 2002). In the case under discussion, although follow-up remains short, the absence of immediate recurrence suggests satisfactory initial efficacy, but does not exclude the possibility of future lesion reappearance. Moreover, the fact that the neovaginal epithelium was squamous and histologically similar to native vagina may have contributed to the favorable short-term outcome.

The discussion of condylomas in neovaginas transcends isolated case reports. It addresses a growingly relevant field: the gynecological health of populations historically understudied and marginalized. Both women with MRKH and transgender women require tailored follow-up protocols that take into account specific risks and the particularities of the various surgical techniques employed. The lack of comparative studies precludes the establishment of universal guidelines, but reports such as the present case help fill this gap and encourage the development of further research. Standardized follow-up and periodic clinical surveillance should be promoted, as HPV-related lesions may arise even in reconstructed tissues (FREGA

A, et al., 2011; RALL KK, et al., 2019; MATSUKI S, et al., 2015). Furthermore, the possibility of high-risk HPV coinfection requires additional vigilance, even when initial clinical lesions are benign (DOORBAR J, et al., 2012; FREGA A, et al., 2011)

Finally, some limitations must be noted. As a single case report, this study does not allow for generalizations. The short follow-up period does not allow conclusions regarding long-term recurrence rates. In the case presented, neovaginal reconstruction was performed through dilation, yielding an organ with squamous epithelium similar to native tissue; thus, the outcomes are comparable to those observed in non-reconstructed vaginas. Precisely due to this similarity, the safety of CO_2 laser therapy in neovaginas constructed by dilation is reinforced. Nevertheless, the publication of such reports is essential to consolidate awareness that condylomas in neovaginas, although rare, represent a clinical reality likely to become more frequent, especially considering transgender patients undergoing vaginoplasty. This case therefore contributes to strengthening the available literature and to the development of future guidelines that acknowledge the uniqueness of these populations

This case highlights the clinical relevance of CO_2 laser therapy as a safe and effective modality for the management of condyloma acuminatum in neovaginal tissue, demonstrating satisfactory anatomical and functional outcomes with complete lesion resolution and symptom relief during follow-up. The favorable response underscores the potential of this technique in preserving tissue integrity in surgically reconstructed anatomy, although the limited follow-up period and the single-patient design restrict the generalizability of the findings. Further prospective studies with larger cohorts and longer observation times are needed to establish standardized treatment protocols and to clarify recurrence rates, long-term outcomes, and quality-of-life implications in this specific patient population.

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