

Lesions of the Neovagina: A Review

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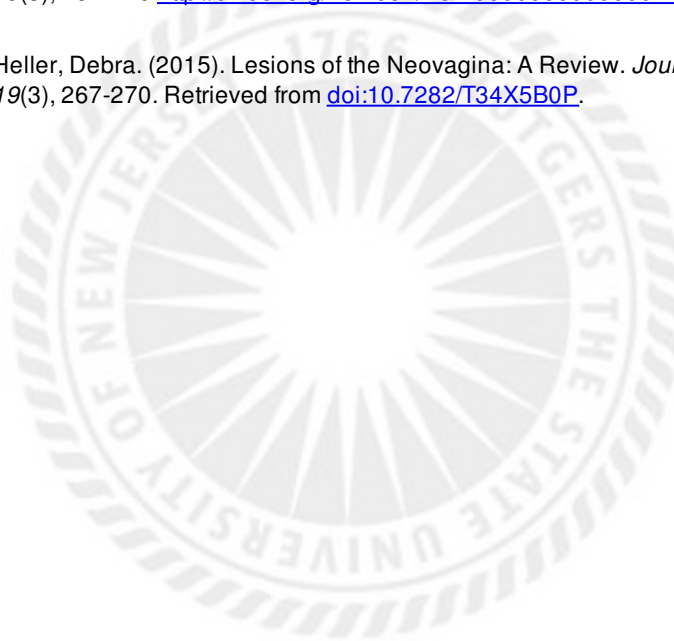
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Lesions of the Neovagina-A Review

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Precis:

Lesions of the neovagina are reviewed.

Abstract:

Creation of a neovagina is uncommon, but may be performed for congenital absence or anomaly, after exenterative cancer surgery, or in male to female transsexuals. A variety of tissues may be used to create the neovagina. Lesions of the neovagina are uncommon, and probably not well known to most practitioners. A review of these lesions will be helpful if such a patient presents.

Key words: Vagina abnormalities, vagina neoplasms, reconstructive surgical procedures, neovagina

Introduction:

Creation of a neovagina is uncommon, but may be performed for congenital absence, such as in Mayer-Rokitansky-Küster-Hauser syndrome, persistent cloaca, intersex disorders where female gender is chosen, after exenterative cancer surgery, or in male-to-female transsexuals. A variety of tissues may be used to create a neovagina. Procedures may involve use of dilators on an intrinsic vaginal dimple, traction from an abdominal approach, or dissection of a space which is then lined by a wide variety of tissues, including skin, split thickness skin graft, bowel, amnion, peritoneum, dura, rectus abdominus flap or others(1,2). Lesions of the neovagina are uncommon, gynecologic protocols for these patients are not well established, and findings in neovaginas are probably not well known to most practitioners. A review of these lesions will be helpful if such a patient presents.

Anatomy & Histology

Tissue transplanted during creation of the neovagina is said by some investigators to take on some of the histologic features of native vagina, however these findings and criteria are not well documented. Transplanted skin has been reported to lose sweat glands and hair follicles, with the vaginal pH and flora reestablishing(1). However, although the epithelium is under the influence of estrogen, with glycogen accumulation, cytology of split skin graft neovaginas have shown that keratinization is not lost(1). In one study of male-to-female transsexuals who had their neovaginas created by inversion of penile and scrotal skin, biopsies taken and evaluated for up to

14 years showed retention of a skin phenotype, including scrotal hair, rather than a conversion to mucosa(3). Bowel neovaginas retain their inherent tendencies to develop polyps and inflammatory bowel disease(1). They are also known to be associated with a mucinous discharge that can be copious(4).

The cytology of the neovagina created from split thickness skin grafts after exenteration for pelvic malignancy has been described(5). A consistent feature was the presence of anucleated keratinizing squamous cells. Superficial and intermediate cells were present, and over the course of up to six years, the maturation shifted to the right, even in the absence of estrogen therapy. A maturation index is stated as % parabasal cells:% intermediate cells :% superficial cells, so that a right shift would indicate greater maturation. As vaginal epithelium is not normally keratinized, and keratinization in native vaginas may be associated in some cases with neoplasia, the authors stress the importance of providing a history of neovaginal presence to the cytopathologist, to allow for accurate interpretation(5). Cytology of inverted penile/scrotal skin was described as being similar but not identical to native vagina(6) with the presence of nucleated squames more likely to be present in male to female transsexuals who were either sexually inactive or participated in non-penetrative intercourse identifying as homosexual, than in those having intercourse penetrating the neovagina, although this did not reach significance(6). These authors found only 4% of their cases had a normal distribution of superficial, intermediate and parabasal cells with lactobacilli(6). Male to female transsexuals are often treated with antiandrogens, and review did not disclose data on the effects of androgens on the neovagina. One study(7) found the cytology of the neovagina created by abdominal traction(Vecchiotti technique) was similar to the native vagina. In this technique, abdominal traction is placed on a device such as an acrylic

olive which is placed in the vaginal dimple inside the hymen, hence the tissue initially more closely approximates vaginal mucosa than neovaginas constructed from skin grafts or bowel.

Infections and Inflammations

Gonorrhea

Gonorrhea has occurred in the neovagina , illustrating the need for these patients to take precautions such as condoms, particularly if exposure risk is high, such as in Bodsworth's patient, who was a prostitute(8).

Inflammatory Bowel Disease

Ulcerative colitis has occurred in colonic neovaginas. The patient described by Hennigen et al(9) presented with vaginal bloody discharge in addition to the gastrointestinal symptoms attributable to her native bowel. Examination and biopsies of the neovagina in this case showed compatible histopathologic findings. It has been suggested that, as there is increased risk of colon cancer with ulcerative colitis, that there is an increased risk of carcinoma arising in a

colonic neovagina affected by ulcerative colitis as well(10), requiring long term follow-up in such patients.

Crohn's disease has also been reported in the neovagina(11). The disease arose in a sigmoid neovagina and ileal-augmented bladder in a 46 XY child , phenotypically female, with multiple genitourinary anomalies including cloacal exstrophy.

Diversion colitis

Diversion colitis has been described in the neovagina(4,12). Diversion colitis is a condition that develops over several years, due to the loss of the short chain fatty acid exposure the mucosa of the colon requires, which was previously obtained by contact with fecal matter(13). While this may be asymptomatic, there are endoscopic changes, including hemorrhage, edema and ulceration, and there may be lymphoid follicular hyperplasia and aphthoid ulcers on pathology(4). The patients in Syed's series(4) presented with severe vaginal discharge mixed with bleeding. Initial therapy with irrigation with short chain fatty acids was helpful in one patient, additional therapy for ulcerative colitis(steroid enemas, mesalazine) and surgery as well in one were required. Toolenaar's series of patients had only mild diversion colitis, and they postulated that fermentation of methylcellulose in lubricants used for sexual activity might produce sufficient short-chain fatty acids to prevent a more severe clinical picture(12).

Diverticulitis

Diverticulitis has been described in a bowel neovagina(14). The patient was found to have diverticuli in the native colon as well, and had presented with fever, abdominal pain, vaginal discharge, and a mass.

Condylomata acuminata

The neovagina created from skin has been shown to be vulnerable to the effects of human papillomavirus(HPV), and both condylomata as well as intraepithelial and invasive squamous neoplasia have occurred. Liguori et al describe condylomata in the neovagina created from penile and scrotal skin of a male-to- female transsexual who was HIV-positive. HPV 16,31,and 33 were identified(15). Condyloma acuminatum has also been described after the McIndoe procedure(16). The McIndoe procedure, like the inversion technique, uses skin for the neovagina, in this case split thickness skin, and it may be that this type of epithelium retains the risk for developing condylomata.

Trauma

Laceration of the cul-de-sac has been described after consensual intercourse in a patient who had undergone creation of a neovagina using dilators. The lesion was allowed to heal spontaneously with only estrogen cream for support(17). An unusual case of perforation of a

bowel neovagina in a male-to-female transsexual presented as abdominal pain and free air under the diaphragm and resolved with supportive care. On questioning the patient, it was discovered that she frequently used a douche pump, and just before presentation had forgotten to fill it with water, and had pumped her neovagina full of air(18). A case of acute peritonitis due to rupture of a bowel neovagina was attributed to a blowout caused by mucus accumulation after stenosis of the neovagina after removal of a stent placed after construction. Also of interest, the authors found the neovagina to be unduly long(over 40 cm), and postulated that it had been created as a repository for drug trafficking in this patient(19).

Rectoneovaginal Fistula

Rectoneovaginal fistula may be a result of a patient continuously wearing a phallic prosthesis to keep the neovagina functional(20) by exerting pressure on the posterior vagina.

Stress incontinence

An unusual case of new onset stress incontinence in a nulliparous young woman with Mayer-Rokitansky-Küster-Hauser syndrome was reported after a traction(Vecchietti) procedure to create a neovagina. The authors postulated lack of suburethral support or change in the urethrovesical angle as possible contributing factors. The patient was satisfactorily treated with a transvaginal tension free tape procedure(21).

Benign Tumors and Tumor-like Lesions

Prolapse

Prolapse of the sigmoid neovagina has been reported, as has prolapse of a vagina created by self-dilatation(22,23). Repairs have focused on preserving the vaginal axis and coital ability(23).

Benign neoplasms

A squamous papilloma arose in a split thickness skin graft neovagina(McIndoe procedure), that raised concern due to its hyperpigmentation(2). The patient had presented with post-coital staining.

Premalignant and Malignant Neoplasms:

Intraepithelial neoplasia

Neovaginas composed of squamous epithelium are vulnerable to HPV infection, as was discussed under the section on condyloma acuminatum. Intraepithelial neoplasia has also been reported, and may be recurrent. There have been reports in the literature of patients treated by vaginectomy for intraepithelial neoplasia in the native vagina, who later recurred in the neovagina(24,25). Guven et al presented a patient with a history of high grade squamous intraepithelial lesion(HSIL) of the vulva, vagina and cervix, who had a split thickness skin neovagina constructed after her initial therapy included vaginectomy. She presented ten years later with HSIL of the neovagina(25). This patient was treated surgically, but laser therapy and 5-fluorouracil have also been utilized in these uncommon cases(25). In their review of the literature, Guven et al found 6 additional reported cases of HSIL in the neovagina, 4 of whom had had HPV-related intraepithelial neoplasia prior to the creation of the neovagina, with time intervals ranging from 6 months to 20 years in between(25). In a study of 240 patients with vaginal agenesis who had construction of neovaginas, long term follow-up (median 16 months, range 11-141 months) revealed 7 patients(2.9%) with low or high grade squamous intraepithelial neoplasia on pap smear, associated with HPV. Three patients reverted to HPV-negative, 4 persisted. One patient was found to have vaginal intraepithelial neoplasia grade 2, treated by laser(26).

Of interest is a case of persistent colonic dysplasia in a colonic neovagina reported by Owens et al(27). Colonic dysplasia as is usually seen in colonic adenomas is known to be a precursor lesion to colorectal carcinoma. Unfortunately, the patient described did not undergo HPV testing, but the authors postulated a possible connection, given that anal carcinomas have been shown to be related to HPV.

Carcinoma

Although rare, carcinoma can occur in the neovagina, and has a tendency to occur at a younger age than carcinoma of the native vagina(1). The posterior vault is the most common location for invasive carcinoma(1). In general, squamous cell carcinomas occur in neovaginas constructed of skin, and adenocarcinomas from neovaginas constructed of bowel(1). If the patient had lower genital tract squamous cell carcinoma prior to the neovaginal construction, it may be difficult to tell if a neovaginal cancer is de novo or a recurrence(28). Symptoms include clear or bloody discharge, and postcoital bleeding(1). Carcinoma may develop many years after creation of a neovagina, with one squamous cell carcinoma 20 years after neovaginal creation(29), one case of adenocarcinoma arising 22 years later(30), and one thirty years later(31), illustrating the need for lifelong follow-up for these patients.

A case of cecal neovaginal adenocarcinoma was attributed to prior radiation the patient had received(32). A patient with a sigmoid neovagina due to cloacal malformation who presented with vaginal bleeding and urinary retention due to a colorectal adenocarcinoma in the neovagina was found to already have lung metastasis at presentation(33). Adenocarcinoma in a sigmoid vagina has also been reported in a patient who had had adenocarcinoma in her native sigmoid

colon many years previously. Given the ongoing risk of a new colon cancer in patients who have already had a colon cancer, the authors point out that it was unfortunate her neovagina wasn't included in ongoing screening(34).

A case of neovaginal melanoma was suggested to be related to radiation as well, as the neovagina, created of skin flaps after major surgery for vulvar squamous cell carcinoma, had come from skin of the thighs and pelvis, where the patient denied major sun exposure to(35). Radiation as a contributing etiology was also suggested by Steiner et al(36), whose patient developed squamous cell carcinoma, and had been treated with radiation for granulation tissue arising in a neovagina created for Rokitansky-Küster-Hauser syndrome. More unusual, the squamous cell carcinoma arose in a neovagina composed of dura. Cases are sufficiently rare that it is unlikely to be possible to prove this conclusively.

Chronic irritation is also thought to be a risk factor for the development of carcinoma in neovaginas. Bobin et al(37) report a case of a squamous cell carcinoma in a neovagina created by tissue cleavage without tissue transplantation in a patient with vaginal agenesis, and attribute her neoplasm to regular use of a prosthesis in the neovagina with chronic formation of granulation tissue and inflammatory pseudopolyps.

Although most reported cases of squamous cell carcinoma arise in squamous lined neovaginas, and adenocarcinomas in bowel neovaginas, unusual presentations occur. In addition to the squamous cell carcinoma arising in dura(36) mentioned previously, a case of squamous cell carcinoma arising in a bladder neovagina has been reported. The authors expressed surprise that the histology was squamous and not transitional(38).

Unusual subtypes of carcinoma have been reported, including a verrucous carcinoma (39). Endometrioid adenocarcinoma arose spontaneously in the blind pouch vagina of a woman with Mayer-Rokitansky-Küster-Hauser syndrome who had not undergone any neovaginal procedures, pointing to the need to follow these patients as well. Possibilities raised for the etiology in this case included Müllerian remnants, or in-utero exposure to oral contraceptives of unknown type(2,40).

The most common presentation of a carcinoma in a neovagina is bleeding, however these patients may present with unusual findings such as rectoneovaginal fistula(20). Carcinoma of the neovagina may be treated by surgery with reconstruction, although this is a significant undertaking. Radiation has been utilized, but may result in vaginal stenosis, already an underlying potential problem in neovaginas(28).

Summary:

The patient with a neovagina is an uncommon occurrence in most clinical practices. A knowledge of specific lesions of the region will be helpful if such a patient is encountered. Although these patients are uncommon enough that no protocols for their follow-up are established, it is clear from the literature that long term close follow-up is indicated. Annual examination with vaginal cytology analysis and biopsy of granulation tissue have been suggested with avoidance of indwelling prostheses until any lesions are healed(36), as chronic irritation is thought to possibly contribute to cancer risk, even without tissue transplantation(37). In particular, HPV-related disease, benign and malignant, is not rare in this population as they become sexually active, and cancers of neovaginas occur at a younger age(41), and HPV testing,

either reflex or concurrent should be integrated in management(Canadian Task Force III).

Radiation history may increase the risk of neoplasia(36). Patients with colonic neovaginas may carry a greater risk of adenocarcinoma if they are individuals who are at greater risk of, or have a history of native colon cancer(34).

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