

# Neovaginal dysbiosis in transgender and cisgender women treated with a julep made with *Rubia tinctorium* maceration (alizarin red) and sodium lauroyl lactylate

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Sir,

Surgical construction of a vagina may be indicated in transgender women and cisgender women with congenital or acquired vaginal absence. It has a positive effect on quality of life and generally enables patients to engage in penetrative sexual intercourse. Genital surgery in transgender women is performed by plastic surgeons, urologists and gynecologists.

In transgender women wishing genital gender affirming surgery, penile inversion or penoscrotal vaginoplasty is the most commonly performed procedure for genital (re)construction.

Though multiple surgical techniques exist, essential steps are the same. A neovaginal cavity is created between bladder and rectum and an inverted penile skin and/or scrotal flap, with or without additional skin grafting, is used to line this cavity. Intestinal vaginoplasty is mentioned as surgical alternative for patients with shortage of penile skin and those who need to undergo revision vaginoplasty. A pedicled, isolated intestinal, predominantly ileum or sigmoid colon segment is used as neovaginal lining.

Excessive neovaginal discharge may have a negative impact on sexual health and quality of life. It may also be indicative of conditions which need treatment. Since various surgical procedures exist to create

a neovagina, as mentioned above, it can be hard to differentiate, diagnose and subsequently treat neovaginal symptoms in transgender women. Especially for health professionals with little experience in the transgender field.

As far as rectoneovaginal fistulas are concerned they occur in approximately 1-2% of transgender women after vaginoplasty [1]. These are predominantly related to (intra-operative) trauma. Intraoperative rectal perforation, which is more likely to occur during revision vaginoplasty, predisposes for fistula formation [2].

Experienced symptoms comprise foul-smelling, brown, neovaginal discharge with or without neovaginal passage of flatus or feces. Diagnosis is usually based on clinical symptoms and neovaginal examination alone. Though in small fistulas a low-residue diet may be chosen as a first noninvasive treatment option, surgical intervention is frequently necessary. Fistulectomy and subsequent primary closure or closure with a local advancement flap or regional flap may be performed in order to treat the fistula. Fecal diversion by temporary colostomy or ileostomy may be indicated.

The incidence of local wound infections after penile inversion vaginoplasty ranges from 4.0-16.8% in current literature [3]. Patients with comorbid diabetes and a history of smoking and illicit substance use have a higher incidence of local wound infections. The

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incidence of local wound infections after intestinal vaginoplasty is approximately 1.2% [4].

When the presence of an abscess is suspected, additional imaging, generally CT scanning, is indicated. Sometimes, neovaginal abscesses can drain spontaneously, however, if not, abscesses should be adequately drained and irrigated.

The surgically constructed neovagina is a microbial and fungal niche, which is hardly studied up till now. Common microbial inhabitants of the penile-inverted neovagina are *Staphylococcus epidermidis*, *Streptococcus anginosus*, *Enterococcus faecalis*, *Corynebacterium*, *Mobiluncus curtisii* and *Bacteroides ureolyticus* [5]. *Lactobacillus* species can also be found [6]. The usual microbial inhabitants of the sigmoid neovagina are, as found by culturing techniques, common intestinal bacteria [7].

After all, the two most invasive bacterial strains are *Mobiluncus* varieties and *Staphylococcus*, especially “*epidermidis*”.

Bacterial overgrowth, sometimes described as dysbiosis, may cause neovaginal discharge and discomfort [8]. In these cases, neovaginal swabs may function as a diagnostic aid. When indicated, neovaginal rinsing or (topical) treatment with antibiotics may treat bacterial overgrowth or dysbiosis.

As far as *Mobiluncus* bacteria are concerned, some authors referred [9] that 12 strains of *Mobiluncus curtisii* and 10 strains of *M. mulieris* were susceptible to 23 antimicrobial agents and 15 other compounds. All strains were susceptible to chloramphenicol, clindamycin, rifampin, tobramycin, vancomycin, virginiamycin, and all beta-lactam antibiotics tested, including imipenem. One strain of *M. mulieris* was resistant to erythromycin and josamycin. All were resistant to colistin, cycloserine, nalidixic acid, and neomycin. Tetracycline had variable activity. All *M. curtisii* strains were resistant to metronidazole and its hydroxy metabolite. Of 10 *M. mulieris* strains, 5 were resistant to metronidazole and 2 were resistant to its hydroxy metabolite. All 12 *M. curtisii* and 1 of 10 *M. mulieris* strains were resistant to tinidazole. *M. curtisii* and *M. mulieris* produced two mutually exclusive clusters of MICs when tested against ampicillin, cefoxitin, cephalothin, moxalactam, alizarin red, Evans blue, and sodium fluoride. *Gardnerella vaginalis* was more susceptible to Nile

blue A than was either *M. curtisii* or *M. mulieris*. Clindamycin and imipenem may be useful agents in the therapy of metronidazole-resistant bacterial vaginosis. Metronidazole, tinidazole, and Nile blue A may be of value in the development of a selective agar for *Mobiluncus* species.

And so *Staphylococcus epidermidis* and *M. curtisii* are the chief protagonists of the neovaginal dysbiosis in transgender and cisgender women and in order not to use chemical antibiotics the best way to destroy the strains is a natural tincture of *Rubia Tinctorium* that contains alizarin red and Sodium lauroyl lactylate, as some AA referred [10].

*Mobiluncus* is a genus of Gram-positive, anaerobic, rod-shaped bacteria. These bacteria may be stained either Gram-negative or Gram-variable. However, they are classified as Gram-positive rods due to the fact that they possess a Gram-positive cell wall, lack endotoxin and are sensitive to vancomycin, erythromycin and ampicillin, but resistant to colistin and metronidazole [10].

Some researchers affirmed that the antimicrobial peptide produced by *Bacillus amyloliquefaciens* reveals antimicrobial activity against the bacterial vaginosis-associated human pathogen *Gardnerella vaginalis*. The ability of this natural peptide to inhibit *G. vaginalis* in combination with the natural antimicrobial agents glycerol monolaurate (Lauricidin), lauric arginate or sodium lauroyl lactylate [10] was tested using a checkerboard approach. This combinaison was found to act synergistically with all of the chosen to inhibit growth of the pathogen, thereby decreasing the risk of developed antimicrobial resistance.

*Staphylococcus epidermidis* is a Gram-positive bacterium, and one of over 40 species belonging to the genus *Staphylococcus*. It is part of the normal human microbiota, typically the skin microbiota, and less commonly the mucosal microbiota and also found in marine sponges.

It is a facultative anaerobic bacteria. Although *S. epidermidis* is not usually pathogenic, patients with compromised immune systems are at risk of developing infection. These infections are generally hospital-acquired.

*S. epidermidis* is a particular concern for people with catheters or other surgical implants because it is known to form biofilms that grow on these devices.

Being part of the normal skin microbiota, *S. epidermidis* is a frequent contaminant of specimens sent to the diagnostic laboratory.

Alizarin (also known as 1,2-dihydroxyanthraquinone, Mordant Red 11, C.I. 58000, and Turkey Red) is an organic compound that has been used throughout history as a prominent red dye, principally for dyeing textile fabrics. Historically it was derived from the roots of plants of the madder genus. In 1869, it became the first natural dye to be produced synthetically.

Alizarin is the main ingredient for the manufacture of the madder lake pigments known to painters as rose madder and alizarin crimson. Alizarin in the most common usage of the term has a deep red color, but the term is also part of the name for several related non-red dyes, such as Alizarine Cyanine Green and Alizarine Brilliant Blue. A notable use of alizarin in modern times is as a staining agent in biological research because it stains free calcium and certain calcium compounds a red or light purple color. Alizarin continues to be used commercially as a red textile dye, but to a lesser extent than in the past.

Madder has been cultivated as a dyestuff since antiquity in central Asia and Egypt, where it was grown as early as 1500 BC. Cloth dyed with madder root pigment was found in the tomb of the Pharaoh Tutankhamun, in the ruins of Pompeii and ancient Athens and Corinth. In the Middle Ages, Charlemagne encouraged madder cultivation. Madder was widely used as a dye in Western Europe in the Late Medieval centuries. In 17<sup>th</sup> century England, alizarin was used as a red dye for the clothing of the parliamentary New Model Army. The distinctive red color would continue to be worn for centuries (though also produced by other dyes such as cochineal), giving English and later British soldiers the nickname of “redcoats”

Legend has it that the most famous diva of the major studios in Hollywood, idest Elizabeth Taylor, wore a wonderful sheath dress crimson dyed, in 1950 in the set of Rhapsody with the Italian actor Gassman.

Staphylococcal biofilms are problematic and play a critical role in the persistence of chronic infections because of their abilities to tolerate antimicrobial agents [11]. Thus, the inhibitions of biofilm formation and/or toxin production are viewed as alternative means of controlling *Staphylococcus aureus* infections. Here, the antibiofilm activities of 560 purified

phytochemicals were examined. Alizarin at 10 µg/ml was found to efficiently inhibit biofilm formation by three *S. aureus* strains and a *Staphylococcus epidermidis* strain. Binding of Ca<sup>2+</sup> by alizarin decreased *S. epidermidis* biofilm formation

Authors recruited: two twins (male who decided to have a neovagina and began transgender and the sister who at the birth was lacking of the presence of a regular vagina, and so a transgender and a cisgender woman).

Microbial dysbiosis is always lurking in both the cases, and many strains of the neovaginal bacteria are resistant to normal and canonical synthetic antibiotics.

Twins are young and necessitate to have sexual intercourse forecasting penile penetration, but malodour is nauseating and vaginal discharge is painful.

Authors have tried to treat this malaise using a micellar topical lotion made with tincture or Rubia tinctorum (0.8% alizarin red) and sodium lauroyl lactylate.

After five days of douches employing the lotion of Rubia tinct. Tinct. and simplest washings bad smell disappeared at all and the vis coeundi reappeared soleciously.

## Aknowledgments

The experiments have been carried out owing to a cosmetic remedy from Northern Italy, called Gynelle fluid, the fragrance of whom is freesia and glaïeuil.

## Consent

The examination of the patient was conducted according to the principles of the Declaration of Helsinki.

## REFERENCES

1. Bouman MB, van Zeijl MC, Buncamper ME, Meijerink WJ, van Bodegraven AA, Mullender MG. Intestinal vaginoplasty revisited: a review of surgical techniques, complications, and sexual function. *J Sex Med.* 2014;11:1835-47.
2. Bouman MB, van der Sluis WB, van Woudenberg Hamstra LE, Buncamper ME, Kreukels BPC, Meijerink WJHJ, et al. Patient-Reported esthetic and functional outcomes of primary total laparoscopic intestinal vaginoplasty in transgender women with penoscrotal hypoplasia. *J Sex Med.* 2016;13:1438-44.
3. Buncamper ME, van der Sluis WB, van der Pas RSD, Özer M, Smit JM, Witte BI, et al. Surgical outcome after penile inversion vaginoplasty: a retrospective study of 475 transgender women. *Plast Reconstr Surg.* 2016;138:999-1007.
4. Colebunders B, Brondeel S, D'Arpa S, Hoebeke P, Monstrey S. An update on the surgical treatment for transgender patients. *Sex Med*

- Rev. 2017;5:103-9.
5. Froese DP, Haggitt RC, Friend WG. Ulcerative colitis in the autotransplanted neovagina. *Gastroenterology*. 1991;100:1749-52.
  6. Grasman ME, van der Sluis WB, de Boer NK. Neovaginal sparing in a transgender woman with ulcerative colitis. *Clin Gastroenterol Hepatol*. 2016;14:e73-e74.
  7. Horbach SE, Bouman MB, Smit JM, Özer M, Buncamper ME, Mullender MG. Outcome of vaginoplasty in male-to-female transgenders: a systematic review of surgical techniques. *J Sex Med*. 2015;12:1499-512.
  8. Jain A, Bradbeer C. A case of successful management of recurrent bacterial vaginosis of neovagina after male to female gender reassignment surgery. *Int J STD AIDS*. 2007;18:140-1.
  9. Spiegel CA. Susceptibility of *Mobiluncus* species to 23 antimicrobial agents and 15 other compounds. *Antimicrob Agents Chemother*. 1987;31:249-52.
  10. Sharma H, Tal R, Clark NA, Segars JH. Microbiota and pelvic inflammatory disease. *Semin Reprod Med*. 2014;32:43-49.
  11. Lee JH, Kim YG, Yong Ryu S, Lee J. Calcium-chelating alizarin and other anthraquinones inhibit biofilm formation and the hemolytic activity of *Staphylococcus aureus*. *Sci Rep*. 2016;6:19267.

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