DOI: https://doi.org/10.2298/SARH200902059S
UDC: 618.16-006.6-089

PRELIMINARY AND SHORT COMMUNICATION / ПРЕТХОДНО И КРАТКО САОПШТЕЊЕ

# Surgical treatment of verrucous carcinoma of the vulva – 15-year experience and literature review

Dragan Stajić[1,2], Borislav Golijan[3], Aljoša Mandić[2,4], Slobodan Maričić[2,4]

[1]Clinical Center of Vojvodina, Department of Gynaecology and Obstetrics, Novi Sad, Serbia;
[2]University of Novi Sad, Faculty of Medicine, Novi Sad, Serbia;
[3]Subotica Medical Center, Department of Gynaecology and Obstetrics, Subotica, Serbia;
[4]Oncology Institute of Vojvodina, Department of Gynaecology, Sremska Kamenica, Serbia

**SUMMARY**
This paper seeks to present surgical procedures, results and complications of treatment of verrucous carcinoma (VC) of the vulva treated at the clinics for gynecology and obstetrics within the Faculty of Medicine, University of Novi Sad (Serbia), as well as a literature review of surgical treatment of VC. During a period of 15 years (2005–2019), we performed 76 surgeries of vulvar cancer, nine (11.8%) due to VC of the vulva. In surgical treatment of vulva VC, we performed complete surgical excision of the tumor (three), complete surgical excision of the tumor with defect coverage using VY fasciocutaneous skin flap (two), simplex vulvectomy (two), radical hemivulvectomy (one), and radical vulvectomy (one). We came across two main complications (22.2%): suture bleeding within 12 hours after excision in one patient (11.1%) and lower extremity lymphoedema after inguinofemoral lymphadenectomy with ligation of the great saphenous vein in one patient (11.1%). Out of the total number of nine treated patients, survival rate was 88.8% (eight patients) with death rate of 11.1% (one patient) within 12 months after surgery. In three patients (33.3%), the disease returned after surgery: one residual tumor after surgery, one relapse on the other side one year after surgery, one newly developed invasive squamous cell carcinoma 10 years after primary surgery.
**Keywords:** verrucous carcinoma; vulva; vulvar cancer; vulvectomy

## INTRODUCTION

Verrucous carcinoma (VC) was first described as a separate histomorphological entity in 1948 [1]. The most common localization of VC is in the nasopharynx and oropharynx but it also occurs in the organs of the anogenital region: anus, rectum, bladder, scrotum, vulva, vagina, and cervix [2]. VC is a locally destructive malignant neoplasm with low metastatic potential and has a long growth period [3]. The pathogenesis of VC is directly related to the mutation of the type 6 human papillomavirus, which causes benign condylomas [4, 5]. Prognosis of VC of the vulva depends on the size of the tumor and the presence of local invasion of the surrounding organs of the anogenital region [6, 7]. Before any procedure, in addition to the evaluation of the external genital organs it is necessary to evaluate organs of the lower genital system (vagina, cervix, urethra, and anus). Complete surgical excision of tumors with histopathologically-confirmed negative edges (minimum 5–8 mm) is a standard therapeutic procedure used in the treatment of vulva VC as it provides good local control of the disease [2, 4]. The most common complications of surgical treatment are bleeding, infection, and skin necrosis, as well as dehiscence of the wound, which can prolong hospitalization and occur more frequently in tumor masses that engulf large areas of the skin or infiltrate surrounding organs [8, 9, 10].

The aim of this work is to present the surgical procedures, results and complications of surgical treatment of vulva VC in a 15-year period (2005–2019) at the Clinic for Gynecology and Obstetrics and the Institute of Oncology of Vojvodina within the Faculty of Medicine, University of Novi Sad (Serbia) as well as a literature review related to the surgical treatment of verrucous vulvar carcinoma.

## METHODS

We summarized different techniques, results, complications, and patient outcomes of surgical treatment of vulva VC over a 15-year period (2005–2019) at the Clinic for Gynecology and Obstetrics and Oncology Institute of Vojvodina.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written consent to publish all shown material was obtained from the patients.

**Received • Примљено:** September 2, 2020
**Accepted • Прихваћено:** June 30, 2021
**Online first:** July 5, 2021

**Correspondence to:**
Dragan STAJIĆ
Svetozara Ćorovica 2
21000 Novi Sad, Serbia
**dragan.stajic@mf.uns.ac.rs**

**Table 1.** Verrucous carcinoma – tumor localization in the vulva region, recurrence, surgical procedure, complications, and treatment outcome

| Case N° | Localization on the vulva | Surgical procedure | Relapse | Complication | Treatment outcome |
|---|---|---|---|---|---|
| 1 | Labia majora | Complete surgical excision to healthy tissue | None | None | 7 years alive |
| 2 | Perineum | Complete surgical excision + V-Y fasciocutaneous skin flap | None | None | 3 years alive |
| 3 | Whole area of vulva | Complete surgical excision to healthy tissue | Residual tumor 6 weeks after surgery | Bleeding 12 hours after the surgery | 12 years alive |
| 4 | Labia minora | Radical vulvectomy with bilateral inguinofemoral lymphadenectomy | Development of new invasive squamocellular cancer 10 years later | Lower limb lymphedema | 15 years alive |
| 5 | Whole area of vulva | Complete surgical excision to healthy tissue | None | None | 8 years alive |
| 6 | The right half of the vulva | Complete surgical excision+ V-Y fasciocutaneous skin fglap | Recurrence on the other side 12 months later | None | 1 year alive |
| 7 | The right half of the vulva | Radical hemivulvectomy | None | None | 1 year alive<br>Loss to follow-up after 1 year |
| 8 | The left side of the labia majora | Simplex vulvectomy | None | None | 4 years alive |
| 9 | The right side of the labia majora | Simplex vulvectomy | None | Local vulva tissue infiltration | Deceased from colonic cancer after 1 year |

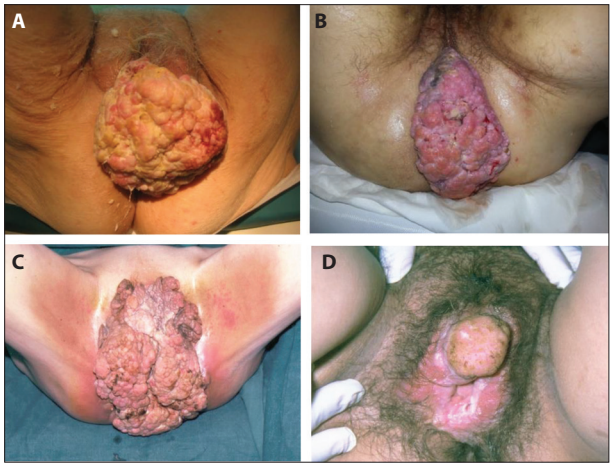


**Figure 1.** Different localization of verrucous carcinoma in the vulva: A – labia majora on the left; B – perineum; C – entire region of the vulva; D – labia minora on the right

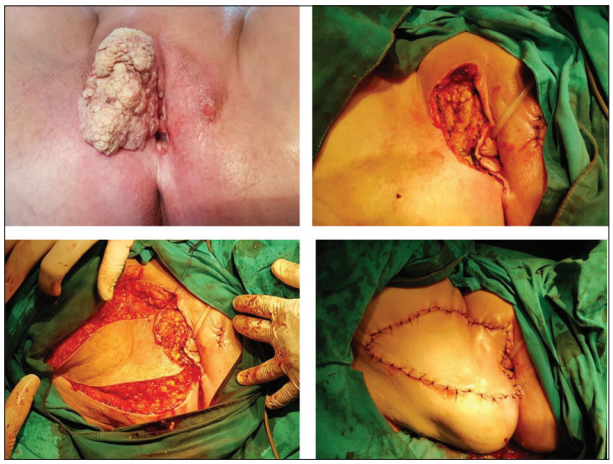

**Figure 2.** Radical surgical excision of the right ventricular verrucous carcinoma with defect coverage using a V-Y fasciocutaneous skin flap

## RESULTS

In the said period of 15 years, approximately 15,000 gynecological surgeries were performed at the Clinic for Gynecology and Obstetrics and the Institute of Oncology of Vojvodina within the Faculty of Medicine in Novi Sad, of which 76 (0.5%) were due to vulvar cancer. In the group of surgically treated women with vulvar cancer, nine (11.8%) cases were due to VC. All the patients were operated on after the usual preoperative preparation, which included bowel preparation 24 hours before surgery, administration of 0.3–0.6 IU SC nadroparin two hours before surgery and lower extremity bandage. Before surgery, 1–2 g of cephalosporin was administered and a Foley urinary catheter was placed. Preoperatively, for all the patients, two transfusion units of decanted erythrocytes were reserved. After surgery, the tumor tissue was sent for histopathological analysis. The patients' age range was 27–79 years. Table 1 shows the localization of VC in the vulva region, the type of used surgical procedure, the occurrence of recurrence, complications, and the outcome of treatment. Figure 1 shows different localizations of VC in the vulva region. Application of a local fasciocutaneous skin flap to cover the defect after extensive surgical excision of labia majora VC is shown in Figures 2 and 3 (A) shows a residual tumor six weeks after complete surgical excision of vulvar cancer. Figure 3 (B) shows relapse of VC on the other side of the vulva 12 months after radical surgical excision using V-Y fasciocutaneous skin flap.

## DISCUSSION

Depending on the localization, the magnitude of the change, and the pathohistological finding of tumor tissue

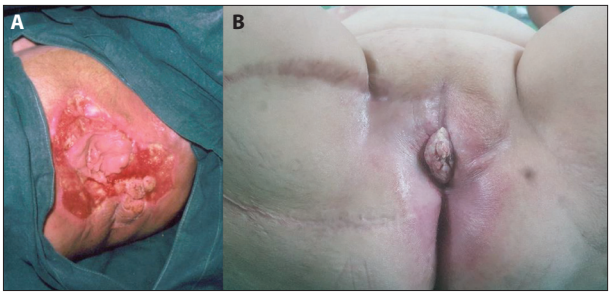


**Figure 3.** A – Residual tumor six weeks after complete surgical excision of vulvar carcinoma; B – recurrence of verrucous carcinoma on the other side of the vulva 12 months after radical excision and coverage of the defect with a V-Y skin flap

biopsies, a surgical procedure is individually planned for each patient. Basic surgical principle for the treatment of vulva VC involves complete removal of the tumor with histopathologically confirmed negative edges (minimum 5–8 mm) [3]. This is not always easy to achieve, especially if the surrounding organs (rectum, urethra, vagina) are involved. In these cases, different skin-muscle flaps are applied to cover the skin defects on the vulva by the principles of plastic and reconstructive surgery [8]. Brătilă et al. [9] describe the coverage of a surgical defect in the perineum by applying a skin graft after the removal of VC. A paper by Campaner et al. [2] shows radical surgical excision of vulva VC with V-Y fasciocutaneous flap without postoperative complications. Minor dehiscence and necrosis of the vulva after excision of the vulva VC have been reported in the literature [8]. In our practice, we applied the fasciocutaneous V-Y skin flap in two (22.2%) patients and no complications were observed in the postoperative period. Using other surgical techniques, one (11.1%) patient underwent radical hemivulvectomy, simplex vulvectomy was performed in two (22.2%) patients, and three (33.3%) patients underwent complete surgical excision of healthy area VC. In one (11.1%) patient, radical vulvectomy was performed with bilateral inguinal-femoral lymphadenectomy, because of the suspicion of invasive squamocellular carcinoma of the vulva in histopathological examination of the biopsy specimen prior to surgery, which again was not confirmed at the definitive pathohistological examination. Dissection of lymph nodes in VC is still controversial. In a review of 50 surgically treated patients with VC, 17 (34%) lymphadenectomies were performed and lymph nodes were without metastases in all the cases [10]. Similar results are presented in other studies. Liu et al. [4] in their paper show the results of treatment of 24 patients with vulva VC who underwent unilateral or bilateral lymphadenectomy, also with negative lymph nodes. In one (11.1%) patient, radical vulvectomy was performed with bilateral inguinofemoral lymphadenectomy, because it was suspected to be an invasive squamocellular carcinoma of the vulva on the histopathological examination of the preoperative biopsy, which was not confirmed at the definitive pathohistological examination. The same patient developed a new invasive squamocellular carcinoma of the vulva 10 years later, affecting the perineum and anus, and treatment included radiotherapy treatment that led to complete tumor regression. In one (11.1%) patient there was a residual tumor that was re-treated with extensive electroexcision without recurrence in the period of six weeks after treatment. In one (11.1%) patient 12 months after radical surgical excision and covering the defect with the V-Y fasciocutaneous flap, a relapse developed on the other side of the vulva resulting in repeated surgical excision. Of complications, we noted bleeding 12 hours after VC excision between stitches in one (11.1%) patient and lower extremity lymphedema after inguinal lymphadenectomy with ligation of the saphenous vein, also in one (11.1%) patient.

## CONCLUSION

The following surgical procedures were applied in the surgical treatment of VC vulva: complete surgical excision of the tumor (three), complete surgical excision of the tumor with defect using the V-Y fasciocutaneous flap (two), simplex vulvectomy (two), radical hemivulvectomy (one), and radical vulvectomy with inguinofemoral lymphadenectomy (one). From the record of 12 months after surgery of all nine (100%) patients who were operated on, survival rate was 88.8% (eight patients), while death rate was 11.1% (one patient). In three (33.3%) patients the disease returned after surgery (one residual tumor after surgery, one relapse on the other side one year after surgery, one newly developed invasive squamous cell carcinoma 10 years after primary surgery). In two patients (22.2%) with residual VC and relapse, we applied re-surgical treatment, while in the patient with newly acquired invasive cancer, radiotherapy treatment was applied.

**Conflict of interest:** None declared.

## REFERENCES

1. Alkatout I, Schubert M, Garbrecht N, Weigel MT, Jonat W, Mundhenke C, et al. Vulvar cancer: epidemiology, clinical presentation, and management options. Int J Womens Health. 2015;7:305–13.
2. Campaner AB, Cardoso FA, Fernandes GL, Veasey JV. Verrucous carcinoma of the vulva: diagnosis and treatment. An Bras Dermatol. 2017;92(2):243–5.
3. Nyberg S, Davidson B, Skeie-Jensen T, Wang Y. Vulvar verrucous carcinoma: 15 years experience in a single norwegian academic cancer center. IJGC. 2019;29:A183.
4. Liu G, Li Q, Shang X, Qi Z, Han C, Wang Y, et al. Verrucous Carcinoma of the Vulva: A 20 Year Retrospective Study and Literature Review. J Low Genit Tract Dis. 2016;20(1):114–8.
5. Akbari A, Pinto A, Amemiya Y, Seth A, Mirkovic J, Parra-Herran C. Differentiated exophytic vulvar intraepithelial lesion: Clinicopathologic and molecular analysis documenting its relationship with verrucous carcinoma of the vulva. Mod Pathol. 2020;33(10):2011–18.
6. Wang Y, Lin R, Zhang B, Zhou H, Lin Z, Yao T. Pembrolizumab in FIGO IVB Verrucous Carcinoma of the Vulva: A Case Report. Front Oncol. 2021;11:598594.

7. Dellinger TH, Hakim AA, Lee SJ, Wakabayashi MT, Morgan RJ, Han ES. Surgical Management of Vulvar Cancer. J Natl Compr Canc Netw. 2017;15(1):121–8.
8. Conri V, Casoli V, Coret M, Houssin C, Trouette R, Brun JL. Modified Gluteal Fold V-Y Advancement Flap for Reconstruction After Radical Vulvectomy. Int J Gynecol Cancer. 2016;26(7):1300–6.
9. Brătilă E, Brătilă CP, Comandaşu DE, Bauşic V, Pop DM, Constantin VD, et al. Perineal reconstruction with biologic graft vulvoplasty for verrucous carcinoma treated by repeated vulvar excisions: a case report. Rom J Morphol Embryol. 2015;56(2):537–43.
10. Zhang W, Wang Y, Chen W, Du J, Xiang L, Ye S, et al. Verrucous Carcinoma of the Vulva: A Case Report and Literature Review. Am J Case Rep. 2019;20:551–6.

## Хируршко лечење верукозног карцинома вулве – 15 година искуства и преглед литературе

Драган Стајић[1,2], Борислав Голијан[3], Аљоша Мандић[2,4], Слободан Маричић[2,4]

[1]Клинички центар Војводине, Клиника за гинекологију и акушерство, Нови Сад, Србија;
[2]Универзитет у Новом Саду, Медицински факултет, Нови Сад, Србија;
[3]Општа болница Суботица, Одељење гинекологије и акушерства, Суботица, Србија;
[4]Институт за онкологију Војводине, Одељење гинекологије, Сремска Каменица, Србија

**САЖЕТАК**

Овај рад настоји да представи хируршке захвате, резултате и компликације хируршког лечења верукозног карцинома (ВК) вулве лечене на гинеколошким и акушерским клиникама Медицинског факултета Универзитета у Новом Саду (Србија), као и преглед литературе о хируршким интервенцијама у лечењу ВК вулве. Током периода од 15 година (2005–2019) обавили смо 76 операција карцинома вулве, девет (11,8%) због ВК вулве. У хируршком третману ВК вулве спроводили смо потпуну хируршку ексцизију тумора (3), потпуну хируршку ексцизију тумора са корекцијом дефекта помоћу *V-Y* фасциокутаног режња (2), симплекс вулвектомију (2), радикалну хемивулвектомију (1) или радикалну вулвектомију (1). Сусрели смо се са две главне компликације (22,2%): крварење из шава у року од 12 сати после ексцизије код једног болесника (11,1%) и лимфедем доњег екстремитета после ингвинофеморалне лимфаденектомије са лигацијом велике вене сафене код једног болесника (11,1%). У укупном броју од девет лечених болесника стопа преживљавања била је 88,8% (осам болесника) са стопом смрти од 11,1% (један болесник) у року од 12 месеци после операције. Код три болесника (33,3%) после операције болест се вратила: један резидуални тумор после операције, један рецидив с друге стране годину дана после операције, један новоразвијени инвазивни планоцелуларни карцином 10 година после примарне операције.

**Кључне речи:** верукозни карцином; вулва; карцином вулве; вулвектомија