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The Keystone Flap for Vulvar Reconstruction: A Case Series and BODY-Q Evaluation

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Background: Vulvar carcinoma is a rare cancer that mainly affects women older than 60 years of age. The most common form is squamous cell carcinoma. The main treatment is vulvectomy, followed by reconstruction. Among reconstructive techniques, the keystone perforator island flap (KPIF) is a relatively novel solution, offering robust vascularity, minimal complications, and rapid recovery. This study analyzed the use of KPIF on 14 patients after vulvectomy, evaluating the aesthetic and functional results through the BODY-Q questionnaire, which has never been applied to evaluate this reconstruction before.

Methods: Patients operated on at the authors' institution between 2016 and 2024 were retrospectively recruited and evaluated. The data collected included demographic and clinical characteristics, intraoperative parameters, and postoperative endpoints, including patient satisfaction assessed through the BODY-Q questionnaire.

Results: The study analyzed 14 patients (mean age 74 y). Among them, 86% had vulvar squamous cell carcinoma. The average operating time was 278 minutes, and the mean hospital stay was 11.5 days. Complications were limited, and follow-up showed satisfactory oncological, aesthetic, and functional results. The BODY-Q evaluation showed a very high level of patient satisfaction.

Conclusions: This study shows that KPIF is a safe, simple, and reproducible technique for vulvar reconstruction, providing favorable aesthetic and functional results. Compared with other flaps, it offers a more concealed donor site, with scars limited to the perineal area, fewer complications, and the possibility of further advancement in case of recurrence. KPIF is a safe and effective technique, which can therefore be included in the armamentarium of vulvar reconstruction surgery. *(Plast Reconstr Surg Glob Open 2026;14:e7756; doi: 10.1097/GOX.0000000000007756; Published online 20 May 2026.)*

INTRODUCTION

Vulvar cancer is a relatively rare malignancy that can affect women of all ages, although it predominantly occurs in postmenopausal patients.[1] The most common histological subtype is squamous cell carcinoma (SCC),[2] whereas other variants, such as Paget disease, basal cell carcinoma, and melanoma, are far less frequent.[3,4] Radical or wide local vulvectomy remains the cornerstone of treatment for invasive vulvar malignancies and often results in complex defects that require reconstructive surgery to restore anatomy, function, and acceptable cosmesis.

Several reconstructive options have been described. Skin grafts may be used for small and superficial defects.[5] Local fasciocutaneous flaps, such as V–Y advancement flaps, and transposition flaps, such as the lotus petal flap, typically harvested from the gluteal fold and tunneled through the subcutaneous tissue, are commonly used for moderate defects.[6–9] Larger or deeper resections may require myocutaneous or perforator-based flaps, including gracilis, transverse rectus abdominis myocutaneous, or deep inferior epigastric perforator (DIEP) flaps, which are associated with increased donor-site morbidity.[10–12]

The keystone perforator island flap (KPIF), first described by Behan[13] in 2003, is a fasciocutaneous or

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adipocutaneous flap based on random or perforator circulation. According to Behan classification, 4 types of KPIF have been described, depending on the extent of dissection and tissue recruitment: type I (skin incision only), type II (deep fascia incised), type III (double opposing keystone flaps), and type IV (with additional rotational component).[13,14] Subsequently, the use of this technique was extended to complex defects in several areas of the body, such as in the trunk, limbs, and face.[15,16]

KPIF has no particular contraindications or limitations, but a reduction in skin elasticity may limit its application. It is not recommended in irradiated areas or in patients with extensive trauma. Excessive wound tension should be avoided, as the most frequent complication is wound dehiscence.[17]

It offers reliable vascularity, minimal donor-site morbidity, and rapid healing; does not require microsurgical dissection or postoperative flap monitoring; and is associated with a limited risk of complications and necrosis due to the solid vascularity[18,19] Despite these advantages, its application in vulvar reconstruction remains underreported in the literature.

The aim of this study was to present our experience with KPIF for vulvar reconstruction following oncological excision, focusing on surgical feasibility, complication rates, and patient-reported outcomes assessed using the BODY-Q questionnaire.

Takeaways

Question: Is the keystone flap well suited for vulvar reconstruction and well appreciated by patients in terms of functional and cosmetic results?

Findings: The keystone flap is suitable for vulvar reconstruction and is associated with good functional and cosmetic results, based on patient-reported outcome measures.

Meaning: The vulvar region can be safely and effectively reconstructed with a keystone flap.

MATERIALS AND METHODS

This work is in line with the PROCESS 2023 criteria and the STROCSS 2025 criteria.[20–22] The design of this study is a retrospective observational cohort study. All patients who underwent excision for vulvar tumors consecutively between 2016 and 2024 at the authors' department were considered for recruitment into the study. Inclusion criteria were radical vulvectomy or wide excision, followed by reconstruction with KPIF. Operations were always performed by a multidisciplinary team, including gynecologists and plastic surgeons, at the University Hospital of Cagliari (Italy).

The data collected consisted of demographic and clinical information, such as age, body mass index (BMI), comorbidities, and length of hospital stay. The stage of the tumor was defined according to the Fédération Internationale de Gynécologie et d'Obstétrique system.[23] During surgery, intraoperative parameters, such as operative time and type of surgery performed, were recorded. All patients were followed up for a minimum of 6 months after surgery. In the postoperative period, all complications were monitored, and patients' aesthetic and functional satisfaction was assessed during follow-up using the BODY-Q questionnaire.[24]

Surgical Technique

There are several types of keystone flaps described in the medical literature, depending on the depth of the incisions and the progressively increasing need to recruit additional tissue for better mobilization and reconstruction. Among the several types of keystone flaps described, the keystone type III flap[13] is the one that was used in our study for reconstruction of defects caused by vulvar tumor excisions in the patients included. It consists of the juxtaposition of 2 keystone flaps that are drawn lateral to the defect and advanced lateromedially, as shown in Figure 1.

The flap is marked starting from the lateral edges of the defect by drawing 2 lines angulated at 120 degrees to the excision major axis. The ratio of hemi-defect area to flap area is 1–0.5:1, as illustrated in Figure 2.

The flap is then dissected on the basis of the preoperative design. Incisions are made deep down to the fascial tissues, which may be scored to facilitate greater mobility and ensure fasciocutaneous vascularization of the flap (Fig. 3). The KPIF has a trapezoidal shape and consists of 2 V–Y flaps with opposite orientations, allowing direct closure of the flap extremities.

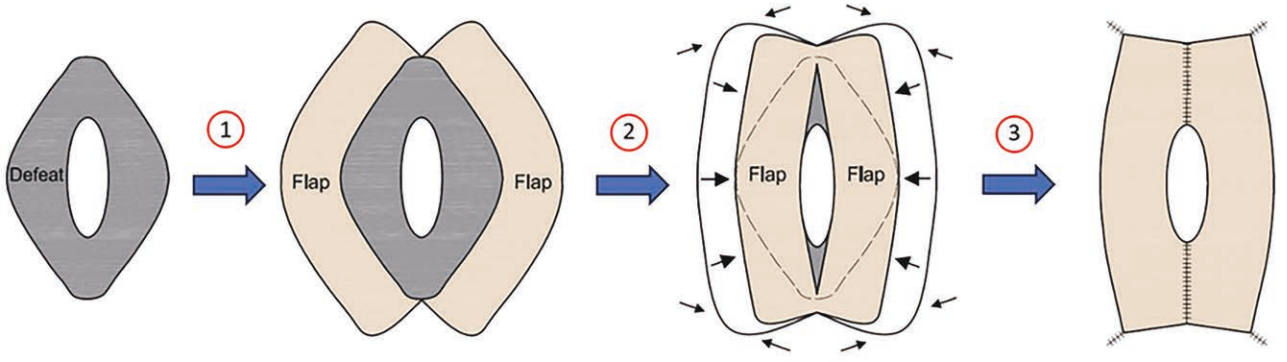

Fig. 1. Sequence of diagrams illustrating the surgical technique used for the keystone flap.

Fig. 2. Vulvar defect and preoperative markings.

Fig. 3. Dissection of keystone flaps.

Once the flap has been raised, it is advanced and fixed medially at the vulvovaginal junction, representing the area of greatest tension, with large-caliber, nonresorbable sutures such as Prolene 2-0. Laterally, where the tissue is looser, it is preferable to use resorbable stitches such as Monocryl 3-0 for the subcutaneous tissue and 4-0 for the skin. Hemostasis must be performed meticulously, as this surgical technique does not involve the placement of drains. In the end, a urinary catheter is positioned and kept in place until the wounds heal, approximately 14 days postoperatively.

The catheter promotes a less humid and cleaner environment and helps prevent scar stenosis of the urethra, as shown in Figure 4. The removal of the catheter occurs when there are signs of stable wound healing and a relatively robust scar has formed, or when the patient expresses extreme discomfort with the catheter, whichever occurs first.

Surgical Technique for Keystone Flap Readvancement

The keystone flap can be redissected along previous incisions, mobilized, and readvanced in the case of further surgery. In our institutional case history, this occurred once. This was a case of a patient who had undergone radical vulvectomy and bilateral KPIF reconstruction in April 2023. The patient later developed a recurrent vulvar Paget disease.

Consequently, the patient underwent a new surgical procedure for the excision of the neoplasm with wide resection margins, including a medial portion of the previous flap (Figs. 5, 6). However, we hypothesized that the previously sculpted KPIF had preserved adequate vascularization, as most of the flap remained in place. Thus, even after excising the recurrent lesion, further advancement of the same flap remained a feasible option and was carried out. The new reconstruction occurred by simply re-incising the previous scar lines, dissecting through the fascia of the underlying muscles, and medially readvancing the flap (Figs. 7, 8).

Intraoperative assessment of vascularity was performed by careful and meticulous dissection, with no undermining of the skin paddle. Instead, a beveled incision was made circumferentially to include subcutaneous tissue supporting the skin. A mild degree of scarring or adhesions was found, which made the readvancement slightly more challenging to determine local anatomy than in the initial stage. The dissection plane was the same as the first time, down to fascial layers, which are included in flap thickness. Fascial scoring around the flap was again used to reduce tension.

No complications were recorded. The flap was viable, kept its shape, and, most importantly, no additional scarring was caused to the area (Fig. 9).

The patient underwent follow-up visits every 3 months. After the first trimester, the scars were well consolidated, the vaginal introitus was patent and free of adhesions, the flap was well-structured, and the patient reported no discomfort (Fig. 10). At the 1-year follow-up, no recurrence was detected.

Patient-reported Outcome Measures Questionnaire (BODY-Q)

All patients completed the BODY-Q, a questionnaire assessing several items relating to body image and satisfaction with plastic surgical results. Figure 11 displays a summary of the questionnaire.[24] A formal licensing for use of the BODY-Q was obtained by the Q-Portfolio Team. Patients were interviewed preoperatively and postoperatively at a minimum of 6 months after surgery.

Fig. 4. Advancement of flaps and donor-site closure in a V-Y fashion.

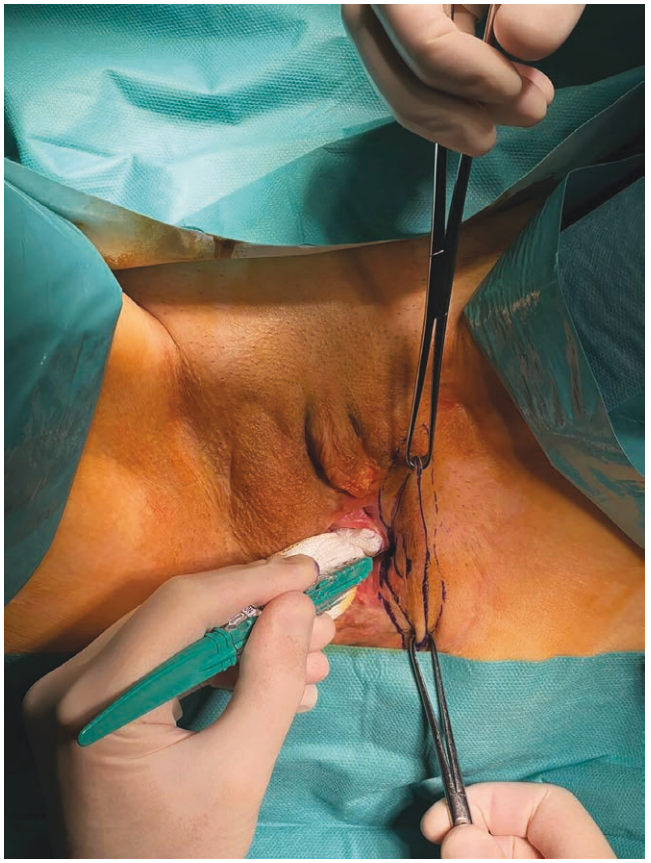

Fig. 5. Preoperative markings for excision of Paget disease and unilateral readvancement of the left flap.

Fig. 6. Surgical defect after re-excision on the left side/left keystone flap.

Fig. 7. Design of a new keystone flap over surgical scars from the previous keystone flap.

Due to the limited sample size, no formal subgroup analysis based on the timing of questionnaire administration (6–12 mo) was performed. However, no clinically appreciable differences were observed between patients who completed the questionnaire earlier versus later.

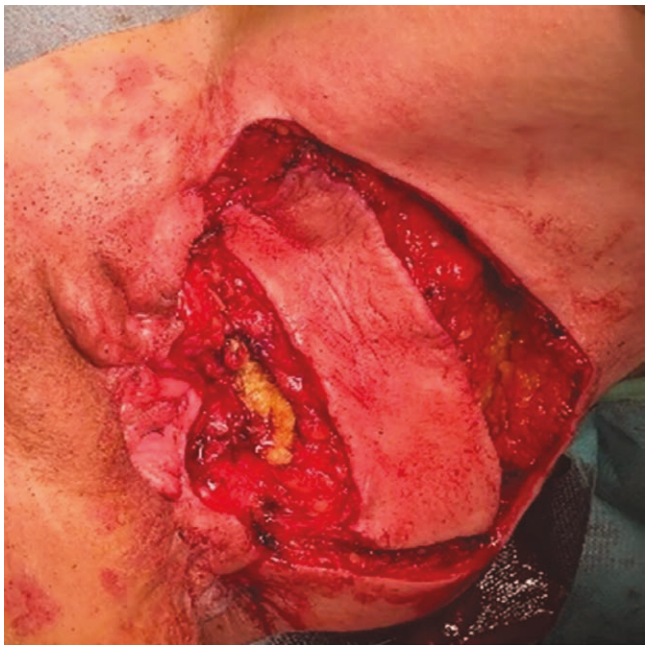

Fig. 8. Sculpturing and tension-free mobilization of the keystone flap overlying the previous keystone flap.

Fig. 9. Immediate postoperative result: keystone flap readvancement and layered suturing.

The scales that were taken into consideration were body image; social, psychological, sexual, and physical functions; physical symptoms; and satisfaction with the body, inner thighs, scars, information received, the doctor/surgeon, the medical team, and office staff.

Fig. 10. Three-month follow-up after keystone readvancement.

Each scale consisted of multiple items rated from 1 to 4, where 1 indicated the worst and 4, the best outcome. The item scores were added to produce a total score, which was then converted to a 0–100 scale (equivalent Rasch-transformed score), with higher values reflecting better outcomes. Statistical analysis was descriptive only, due to the small size of the study group, and consisted of mean values and ranges for continuous values, or frequencies for discrete variables.

RESULTS

The study involved a total of 14 patients, with a mean age of 74 years (range 61–82 y) and a mean BMI of 29.3 kg/m^2 (range 22.1–38.5 kg/m^2). Among the most common comorbidities, 10 patients had hypertension and 4 had type 2 diabetes mellitus. Twelve patients had SCC of the vulva, whereas 1 case had Paget disease and another had basal cell carcinoma. Tumor stage, classified according to the Fédération Internationale de Gynécologie et d'Obstétrique system, showed 2 patients with stage IA disease, 7 with stage IB, and 5 with stage III disease with lymph node involvement.

The surgical results showed a mean operative time of 278 minutes, ranging from 95 to 470 minutes. The average hospital stay was 11.5 days, ranging from a minimum of 7 to a maximum of 20 days.

Defect and flap dimensions are summarized in Table 1. The mean defect width was 8.9 cm (range 7.5–10.5 cm), and the mean defect length was 10.9 cm (range 9.5–12.5 cm). The mean follow-up was 11 months (6–12 mo).

Postoperative complications were few and minor. In 1 case, a patient with diabetes developed partial wound dehiscence, which required surgical revision. Another patient had partial dehiscence, which was treated with

APPEARANCE	when naked	wide	skin	WORK LIFE	EXPERIENCE
ABDOMEN	CHEST	dress to hide	look undressed	accepted at work	DOCTOR
clothes fit	loose t-shirt	the length	PHYSICAL FUNCTION	people listen	professional
size	lie on back	the location	get up from bed	treated the same	easy to understand
from side	stand up	how old	bend side to side	stand up for self	answered questions
shape	masculine	how noticeable	walk or move around	same opportunities	respectful
in swimsuit	when active	the amount	bend over	feel confident	feel comfortable
toned	snug t-shirt	people seeing	moderate exercise	eat around others	involved decisions
when naked	shape	look up close	up down stairs	confident at events	understood
ARMS	bend over	HRQOL	stand a long time	comfortable weight	what's best
size	profile	APPEARANCE DISTRS	PHYSICAL SYMPTOMS	great about weight	available concerns
smooth	mirror	feel unhappy	tired during day	EATING CONCERNS	spent enough time
shape	HIPS/THIGHS	feel stressed	back pain	EATING BEHAVIOUR	INFORMATION
skin looks	size	feel down	Joint pain	feel satisfied	questions answered
toned	shape	feel anxious	leg pain discomfort	eat healthy food	written information
lifted up	skin looks	worry look normal	feeling off balance	show self-control	activities to avoid
not covered	smooth	worry I am ugly	feeling weak	feel in control	how surgery done
BACK	from behind	avoid people	short of breath	chew thoroughly	recovery time
smooth	INNER THIGHS	interest doing things	swollen feet	eat right amount	surgery options
different angles	smooth	BODY IMAGE	skin rash infection	eat at right speed	complications
toned	skin looks	positive toward body	perspiration	unhealthy foods	others experience
when naked	toned	not perfect but like it	PSYCHOLOGICAL	stop before full	feel yourself
BODY	when naked	happy with body	believe in myself	EATING DISTRESS	recovery pain
dressed	NIPPLES	proud of body	proud of myself	embarrassed	MEDICAL TEAM
clothes fit	shape	think body attractive	happy	out of control	protected privacy
size	size	feel good naked	like myself	unhappy	friendly
shape	flat	have body I want	emotionally strong	ashamed	respectful
photos	snug t-shirt	EXPECT: COSMETIC	in control of my life	failure	answered questions
behind	without shirt	look fantastic	confident	discouraged	easy to talk to
from side	SCARS	tell me I look great	accept myself	disappointed	attentive
summer clothes	dress to hide	people will be proud	comfortable	guilty	thorough
swimsuit	wide	will be transformed	feel great	frustrated	worked as team
unclothed	location	good things happen	SEXUAL FUNCTION	willpower	knowledgeable
BUTTOCKS	length	will feel like I fit in	fulfilling	EATING SYMPTOMS	available
size	noticeable	close relationships	undress	vomiting	OFFICE STAFF
from side	color	new people	satisfied sex life	rapid heart rate	respectful
shape	thick	EXPECT: WLOSS	lights on	regurgitation	comfortable
smooth	crooked	feel better	attractive naked	dizziness	knowledgeable
skin looks	people seeing	energy	SOCIAL	low blood sugar	attentive
CELLULITE	not covered	looks	with people I know	food getting stuck	thorough
deep	SKIN	exercise	people listen	heartburn upright	worked as team
dress to hide	look bigger	happier	accepted by people	food taste	welcomed
certain clothes	dress to hide	confident	included	heartburn laying	caring
lumpy	certain clothes	goal weight	first impression	pain	answered questions
noticeable	hangs	control of life	take part in life	perspiration	available concerns
dimpling	amount	new person	make new friends	nausea	
amount	people seeing	self-control	group situations	diarrhea	
skin	when naked	meeting people	people I don't know	constipation	
people seeing	STRETCH MARKS	sex life	walk into a room	bloating	
up close	certain clothes	social life			

Fig. 11. Items explored by the patient-reported outcome measures Body-Q. Distrs, distress; HRQOL, health-related quality of life; WLOSS: weight loss.

outpatient dressings for approximately 1 month, resulting in complete healing. Only 1 case of long-term urinary incontinence was observed, and no episodes of flap necrosis occurred.

Regarding the single case of long-term urinary incontinence, the condition was considered most likely related to patient-specific predisposing factors, including a history of multiple pregnancies and vaginal deliveries, as well as overweight status. The incontinence was primarily attributed to urethral hypermobility rather than to distortion of peri-urethral tissues caused by flap inset. The condition was subsequently managed and resolved by the gynecology team. The 2 cases of partial wound dehiscence and the single case of urinary incontinence might be related to higher BMI in combination with patient comorbidities.

During follow-up, 1 patient experienced urethral recurrence; however, given her frail clinical condition and history of radical surgery performed at another institution for SCC of the uterine cervix, further demolitive surgery was considered inappropriate. Therefore, the patient was

Table 1. Defect Dimensions and Planned Keystone Flap Width for All Patients

Patient	Defect Width, cm	Defect Length, cm	Planned Width of Each Hemi-keystone Flap, cm*
1	7.5	9.5	3.8
2	10.0	11.0	5.0
3	9.5	10.5	4.8
4	8.5	10.0	4.2
5	10.5	12.5	5.2
6	10.0	12.0	5.0
7	9.5	11.5	4.8
8	9.0	12.0	4.5
9	10.0	12.5	5.0
10	7.5	9.5	3.8
11	8.0	10.0	4.0
12	7.5	9.5	3.8
13	9.0	10.5	4.5
14	8.5	11.0	4.2

*The base of each hemi-keystone flap was planned to correspond to approximately half of the maximal defect width on each side.

referred for exclusive radiotherapy, without additional surgical reconstruction.

Figure 12 summarizes the reported outcomes of this study. Figure 13 summarizes the results of the BODY-Q. Deceased patients are those shown with the yellow lines. Patients who responded to the BODY-Q showed a high degree of satisfaction with the various items. All 11 patients interviewed reported not having sexual intercourse after surgery and therefore did not respond to the dedicated section.

As shown in Figure 13, the 3 yellow-highlighted rows indicate patients 3, 7, and 11, who did not complete the BODY-Q questionnaire. All 3 had an uncomplicated postoperative course but were deceased at the time of survey administration due to causes unrelated to vulvar cancer or the reconstructive procedure. The remaining 11 patients completed the questionnaire.

None of the 11 patients who completed the BODY-Q reported resuming sexual intercourse after surgery. Follow-up interviews revealed that this was not due to pain, functional restriction, or complications related to the reconstruction. The reasons reported were absence of a sexual partner (n = 6), psychological inhibition or fear of damaging the reconstructed area (n = 3), and preexisting sexual inactivity (n = 2). Based on these findings, we acknowledge that a longer term assessment specifically evaluating eventual resumption of sexual activity would provide further meaningful functional information. Results of the BODY-Q (patient satisfaction, scores 0–100) are displayed in Figure 14 as mean values and SD.

DISCUSSION

This study shows that vulva reconstruction with the KPIF is a safe and relatively easy technique and also yields a good outcome from an aesthetic perspective, based on surgeon and patient evaluations. Currently available techniques for major vulvar reconstruction are fasciocutaneous and myocutaneous flaps, which often cause relevant functional and aesthetic sequelae at the donor sites, that is, abdominal flaps, such as vertical rectus abdominis myocutaneous or DIEP flap, gracilis flap, or other large fasciocutaneous options.[6–12] The KPIF appears to be more concealed in the perineal aesthetic subunit, unlike the other techniques, which cause unsightly donor-site scars. It addresses all 3 anterior–posterior areas of the vulvar region, as divided per sagittal direction: upper, middle, and lower thirds. Due to its versatility, we consider this flap a first-choice option for the reconstruction of superficial defects of all thirds of the vulva. The algorithm shown in Figure 15 illustrates this, within all reconstructive options for vulvar reconstruction.

With regard to the V–Y flap, the most similar "antagonist" to the KPIF, this type of reconstruction is very advantageous, and the complication rate is very low, as is the risk of flap loss. However, the V–Y flap is based on a random circulation and requires a large length and width, which causes very long and visible scars extending beyond the perineal aesthetic subunit. These scars often inappropriately encroach on adjacent aesthetic subunits, such as the medial region of the thigh or the gluteal region. These limitations seem to be overcome by the KPIF flap.

The lotus flap requires the identification of the pudendal artery on which the transposition will then be based. For this reason, this flap is more prone to complications such as partial necrosis[9] and additionally leaves very visible scars. In terms of outcome measures such as complication rates and hospital rates, the proposed technique is comparable to those for surgical indication (V–Y flap, gluteal lotus flap).

Hand et al[6] in their study on 42 V–Y fasciocutaneous advancement flaps for vulvar reconstruction, report a mean operative time of 179 minutes and a hospital stay of 3 days. The hospitalization is far shorter than in our case histories, but there is a clear geographic bias in this, since the European National Health Systems tend to keep patients hospitalized for longer periods than American settings. These authors reported complication rates slightly higher than in our series, that is, a 33% incidence of wound dehiscence, 7% incidence of postoperative fever and urinary tract infection, 4% incidence of sepsis, and a fatal event. Another study by Lazzaro et al[8] on 8 V–Y fasciocutaneous gluteal flaps reported the same duration of hospital stay (14 days) and similar incidence of complications (wound dehiscence 13% and partial necrosis 13%). Argenta et al[9] described a series of 80 lotus petal flaps, with a higher incidence of wound dehiscence (20%) compared with our series, and a 12% of partial flap loss, in some cases requiring reintervention (43% of flap losses). The utility of the KPIF flap warrants the introduction of this option in the algorithm of vulvar reconstruction as a first-line option for superficial defects (Fig. 15).

This series also describes, for the first time, the adoption of the BODY-Q for the evaluation of patient satisfaction in this type of reconstruction. We also demonstrate that KPIF can be reused and advanced in cases of oncological recurrence, thereby reducing the need for more invasive secondary procedures. This study supports KPIF as a

Demographic and Clinical Data	DETAILS
Number of patients	14
Mean Age	74 years
Mean BMI	29.3 kg/ m² (range 22.1-38.5)
COMORBIDITIES	
Hypertension	10 patients
Diabetes Mellitus type 2	4 patients
ONCOLOGICAL FEATURES	
Squamous cell carcinoma (SCC)	12 patients
Paget's disease	1 patient
Basal cell carcinoma (BCC)	1 patient
FIGO STAGE	
IA	2 patients
IB	7 patients
III (lymph node involvement)	5 patients
SURGICAL RESULTS	
Average operating time	278 min (range 95-470 min)
Average hospital stay	11.5 days (range 7-20 days)
TYPE OF OPERATION	
Radical vulvectomy + bilateral inguinal lymphadenectomy + 2 bilateral keystone flaps	9 patients (64,3%)
Simple vulvectomy + 2 bilateral keystone flaps	1 patient (7,1%)
Radical vulvectomy + sentinel lymph node biopsy + 2 bilateral keystone flaps	4 patient (28,6%)
COMPLICATIONS	
Partial wound dehiscence (1 requiring surgical revision, and 1 ambulatory dressings)	2 patients (14,3%)
Long-term urinary incontinence	1 patient (7,1%)
Flap necrosis	None observed (0%)
FOLLOW UP	
Vaginal recurrence (6 months, treated with brachytherapy)	1 patient (7,1%)
Urethral recurrence (16 months, treated with reoperation)	1 patient (7,1%)
Local vulvar recurrence (surgical enlargement + keystone flap re-advancement)	1 patient (7,1%)
Disease-free patients	All patients
Aesthetic and functional satisfaction	High (according to Body-Q prom)

Fig. 12. Summary of demographic and clinical results. PROM, patient-reported outcome measures.

valid option for vulvar reconstruction, offering an effective alternative to local and myocutaneous flaps already described in the literature.

The KPIF has several advantages when used for vulvar reconstruction:

- Reliable vascularization, as it preserves musculocutaneous perforators, thereby reducing the risk of necrosis compared with random flaps (eg, V–Y flap).
- Lesser donor-site morbidity, unlike myocutaneous flaps (eg, gracilis, transverse rectus abdominis myocutaneous, DIEP), since it does not require removal of muscle, thereby avoiding functional deficits and complications such as incisional hernias.
- Better aesthetic results, as scars are less noticeable than with local flaps such as V–Y, gluteal, abdominal, and thigh flaps, which may leave more visible marks on the thighs or buttocks because they extend beyond the vulvar aesthetic subunit.
- Ease of execution and reproducibility.
- Low incidence of complications.
- Possibility of readvancement in cases of incomplete excision or oncological recurrence.

However, this study has other limitations. The patient sample is relatively small (14 cases) due to the low incidence of the disease and the small catchment area of the study setting.

Therefore, a study on a larger cohort of patients will be required. Furthermore, a direct comparison with other more established reconstructive techniques would have allowed a better quantification of the benefits of KPIF

patient	BI ERTS	SF ERTS	PF ERST	PHF ERST	PS ERST	SF ERST	SB ERST	SIT ERST	BCS ERST	IN ERST	DS ERST	MT ERST	OS ERST
I	85	81	77	82	81	/	82	92	78	100	100	100	92
II	79	78	81	76	76	/	72	77	71	90	100	100	92
III													
IV	85	86	86	90	86	/	87	92	83	90	92	92	92
V	79	86	81	82	81		82	92	83	90	100	100	100
VI	85	81	86	90	81	/	82	84	83	90	92	100	92
VII													
VIII	79	78	81	82	81	/	87	84	83	90	92	100	92
IX	79	81	81	82	86	/	82	84	83	100	92	100	92
X	92	86	86	82	86	/	82	77	78	100	92	100	92
XI													
XII	79	86	81	82	81		82	92	83	90	100	100	100
XIII	79	78	81	76	86		72	77	71	90	100	100	92
XIV	85	81	77	82	86		82	92	78	100	100	100	92

Fig. 13. Summary from the administration of the patient-reported outcome measures Body-Q. BCS, appraisal of body contouring scars; BI, body image; ERTS, Equivalent Rasch Transformed Score (0–100); DS, satisfaction with doctor/surgeon; IN, satisfaction with information; MT, satisfaction with medical team; OS, satisfaction with office staff PF, psychological function; PHF, physical function; PS, physical symptoms; SB, satisfaction with body; SF, sexual function; SIT, satisfaction with inner thighs. Yellow-highlighted rows indicate patients who were deceased at the time of questionnaire administration and therefore did not complete the BODY-Q.

BODY-Q PARAMETER	MEAN SCORE (0–100)	STANDARD DEVIATION (±)
BODY IMAGE	82.3	2.1
SOCIAL FUNCTIONS	82.0	2.8
PSYCHOLOGICAL FUNCTIONS	81.6	3.2
PHYSICAL FUNCTIONS	82.3	2.5
PHYSICAL SYMPTOMS	82.8	2.9
SATISFACTION WITH THE BODY	81.0	3.0
SATISFACTION WITH INNER THIGHS	85.7	2.4
SATISFACTION WITH SCARS	79.4	3.1
SATISFACTION WITH INFORMATION	93.6	1.8
SATISFACTION WITH DOCTOR/SURGEON	96.3	1.5
SATISFACTION WITH MEDICAL TEAM	99.2	0.8
SATISFACTION WITH OFFICE STAFF	93.4	2.2
SEXUAL FUNCTION	No patients reported resumption of sexual activity	

Fig. 14. Mean value and SD across the patient population with regard to each item of the Body-Q.

compared with existing options. Another weakness is the relatively short follow-up.

An important possible source of bias for this study pertains to the relatively advanced age of the patients, which reduces patients' interest in the cosmetic appearance of the vulvar region, compared with younger generations, in whom self-perception of the area is higher. Finally, a little-explored but highly relevant aspect is the impact on sexual function: as none of the patients in the study resumed sexual intercourse after surgery, a specific analysis on this

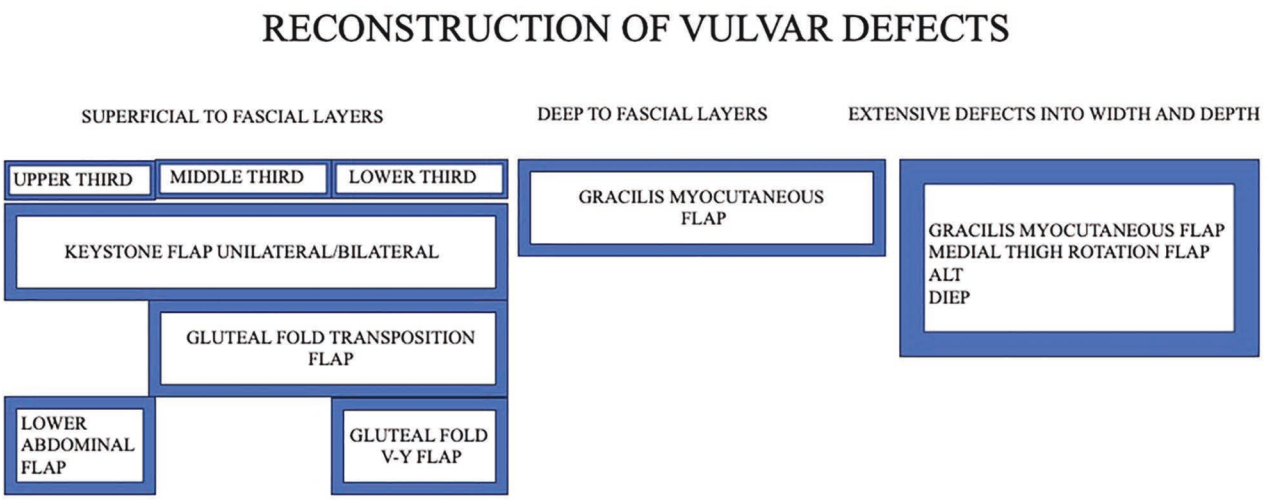

Fig. 15. Newly proposed algorithm for vulvar reconstruction, mentioning the KPIF flap as a first-line option in superficial defects. ALT, anterolateral thigh flap.

issue would be useful to further improve the quality of postoperative life.

The absence of postoperative sexual activity in our cohort was not related to pain, dyspareunia, or anatomical restriction, but rather to psychosocial and relational factors. Given the importance of sexual function in vulvar reconstruction, longer-term follow-up, including specific reassessment of whether patients eventually resume sexual intercourse, would be particularly valuable and is planned for future evaluations. Overall, the KPIF can be added to the surgical armamentarium as a valid option for vulvar reconstruction.

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DISCLOSURE

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