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ORIGINAL ARTICLE
Reconstructive

Sensitivity after Clitoral Reconstruction in Patients with Female Genital Mutilation

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Background: In the past decades, reconstructive choices after female genital mutilation extended beyond de-infibulation and scar release. The current trend to expand techniques addressing sexual and aesthetic aspects by reconstructing the clitoris and prepuce, and dissecting the clitoral nerves raises concern, as there is a paucity of evidence on the functional outcomes and suspected iatrogenic lacerations.

Methods: A total of 128 female genital mutilation patients were included in the study. To evaluate clitoral sensitivity after elevation, the Semmes-Weinstein-monofilament test was performed before and after genital reconstruction.

Results: Preoperatively, patients with a visually intact clitoris showed significantly better sensitivity compared with patients with a mutilated clitoris or infibulation ($P < 0.0001$). Surgery was performed in 84 patients. After clitoral reconstruction (CR), 70 of 73 patients were able to perceive 2.83 monofilaments (95.9%), whereas three perceived 3.61. Patients with a visually intact clitoris served as control, and 95.0% perceived 2.83 monofilaments. We showed a significant improvement of clitoral sensitivity ($P = 0.0020$) in the subgroup consisting of patients with a mutilated clitoris in whom the test was performed before and after reconstruction.

Conclusions: Clitoral sensitivity improves significantly after CR. Seventy of 73 patients attained the same sensitivity as unharmed women. No patient showed a decreased sensitivity compared with their preoperative findings. Therefore, our study supports the argument that CR offers sufficient improvement of objective clitoral sensitivity without additionally addressing clitoral nerves. *(Plast Reconstr Surg Glob Open 2024; 12:e5851; doi: 10.1097/GOX.0000000000005851; Published online 14 June 2024.)*

INTRODUCTION

Worldwide, more than 200 million girls and women are estimated to have undergone female genital mutilation (FGM).[1] It has been shown that women with FGM show a higher prevalence of severe depression,[2,3] dyspareunia, and impaired sexual function,[4,5] compared with women without FGM. Therefore, emphasis has been placed on the value of health education, counseling, and psychosexual care of FGM victims.[4,6,7] However, depending on the patients' functional and aesthetic complaints, they should also be informed about the possibility of surgical reconstruction.[8] Although there are obvious benefits of de-infibulation for infibulated women,[9] there are no clear guidelines regarding further reconstruction techniques. Specifically, it has been discussed that potentially unharmed structures such as clitoral nerves and vessels could be harmed, compromising clitoral sensitivity. To date, various surgical techniques, based on the elevation of the clitoral body to address sexual function, as described by Foldès[10] and Thabet,[5] have been proposed. In this context, neurotizing and molding of the clitoral stump,[11,12] the transplantation of split thickness skin grafts to the vulva,[13] and various local flaps have been described.[13–18]

However, Sharif et al criticize the fact that reconstruction of the female genitalia, and specifically the clitoris,

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is promoted as a form of "sexual healing" by some institutions.[19] The authors highlight that the causal relationship between orgasm capacity and resection of parts of the clitoris is not well established.[20] Additionally, because it has been proven that the major part of the clitoris (the clitoral body and the crura) remains intact after FGM,[4] the authors state that FGM victims can experience sexual desire, arousal, orgasm, and overall sexual satisfaction within a normal range,[20] arguing that the WHO does not recommend clitoral reconstruction (CR).[20,21] The Royal College of Obstetricians and Gynecologists even states that "clitoral reconstruction should not be performed since current evidence suggests unacceptable complication rates without conclusive evidence of benefit."[22] On the other hand, Foldès et al report an improvement or at least no change in pain and clitoral pleasure in 98% of patients undergoing CR.[23] Various reports mention an overall positive impact of reconstruction.[24–26]

To showcase the low complication rate and potential improvement of sensitivity after CR, we present a study of women with FGM who underwent CR and an evaluation of the pre- and postoperative clitoral sensitivity using the Semmes-Weinstein monofilament (SWM) test.

Takeaways

Question: Does clitoral reconstruction improve clitoral sensitivity?

Findings: Clitoral elevation was performed without any procedure specifically addressing the clitoral nerves. Sensitivity was measured using Semmes-Weinstein-monofilaments. Postoperatively, 95% of female genital mutilation patients were able to perceive the same clitoral sensitivity as unharmed women. No patient showed a decreased sensitivity compared with their preoperative findings.

Meaning: Clitoral elevation is safe and effective in restoring sensitivity to the threshold of unharmed women, without additionally addressing clitoral nerves.

MATERIALS AND METHODS

Classification

The current WHO classification[27] does not allow discrimination between patients with or without clitoral involvement in type III mutilations. Therefore, we used a modified classification scheme.[28] (**See table, Supplemental Digital Content 1**, which displays FGM classification of the World Health Organization, modified to allow for adequately staging clitoral involvement in type III mutilation and clinical presentation. Women with resected clitoral glans were highlighted by adding a "c" to the present classification.[28] In all remaining type III patients without this supplement, an unharmed clitoris was detected intraoperatively. "X" corresponds to preoperative findings where the extent of clitoral involvement could not be verified due to the overlying scar preoperatively. The gray rows represent the types of FGM mutilations, that were used as the control group. **http://links.lww.com/PRSGO/D235**.)

Patients

To improve the evaluation of our results, SWM was used in all patients who consented to sensitivity assessments as a routine procedure, from November 2018 to June 2023. However, some of the patients did not consent to the sensitivity assessment at every examination.

In total, 128 patients were included in the study. The most frequent countries of origin were Somalia, Gambia, and Sudan. Mean age was 28.5 years (demographic information is available in Supplemental Table 2). (**See table, Supplemental Digital Content 2**, which displays the mean age and origin of the patients. **http://links.lww.com/PRSGO/D236**.) They presented on their own initiative or were referred by nongovernmental organizations or health-care providers. All pre- and postoperative care was carried out in a single center. Surgery was performed on 84 patients by the same surgeon. The control group included assessments of patients with a visibly unharmed clitoris (type Ia/IIa, n = 20; **Supplemental Table 1, http://links.lww.com/PRSGO/D235**), representing the normal range of clitoral sensitivity. Five of the eight patients with FGM type IIa were operated on despite their clitoris not being lacerated or addressed during surgery, mainly for inclusion cysts. Patients with previously resected clitoral glans were reconstructed according to Foldès et al[23] (n = 49), whereas in patients with an unharmed clitoris detected during surgery underneath the overlying scar (type IIIa/b/c, n = 28), surgery was limited to a de-infibulation procedure (Table 1). Final classification in type III was adapted according to the intraoperative findings, using a modified classification described previously by the authors.[28]

All data were analyzed retrospectively, evaluating medical records. The investigation was performed in accordance with the Declaration of Helsinki. The Berlin Medical Association ethics committee approved the study (Eth-59/20).

Reconstruction Techniques

Clitoral re-elevation was performed, as described by Foldès[23] and Thabet[5], in all patients with previously resected clitoral glans. The dissection was extended above the palpable clitoris; the clitoral stump was identified and dissected superiorly to the upper edge of the elbow of the clitoris. The retaining ligament was dissected close to the retro-crural fascia. The thin fibers of the ligament, extending laterally to the presymphysis fibrous coating were bluntly mobilized to enable a tension-free elevation toward its new position (Fig. 1A-B). According to Blayney et al, this maneuver allows an anteroposterior mobilization of up to 3 cm without compromising the neurovascular bundle[29,30] (Fig. 1C). The overlying scar tissue was resected. The clitoral nerves were visualized without neurolysis. The clitoris was maintained in the new position by merging the lateral soft tissue behind it (Fig. 1D). No further fixation was used to avoid painful tension or compromising the clitoral nerves. The tip of the clitoris was left to epithelialize by secondary intention.

Table 1. Distribution of Included Patients

Type	n	Surgery Total	Surgery with Clitoral Elevation	Sensitivity Tested		
				Preoperative	Postoperative	Preoperative + Postoperative
1a	16	0	NA	**16**	NA	NA
1b	4	0	0	4	NA	NA
2a	8	5	NA	**4**	4	NA
2b	47	37	36	37	29	19
3a	19	19	NA	10	18	9
3b	5	5	NA	4	5	4
3c	4	4	NA	4	4	4
3ac	4	4	3	2	4	2
3bc	5	5	5	3	5	3
3cc	5	5	5	1	4	0
3x	11	0	NA	11	NA	NA
Total	128	84	49	96	73	41

Because not all patients accepted the measurements at every time point, the count in the preoperative and postoperative row does not necessarily refer to the same patients. The control group is depicted in bold font.

Evaluation of Clitoral Sensitivity

Clitoral sensitivity was evaluated by SWM of the following sizes: 2.83, 3.61, 4.31, 4.56, and 6.65. The filaments have been widely used for pressure and touch perception, and have been found to be a valid tool in the examination of the genital region.[31,32]

The evaluation started with the 2.83 monofilaments and continued until the patient was able to perceive the monofilament. In the case of a type IIb/III mutilation, sensitivity was tested in the midline scar over the palpable clitoris. The test was performed the day before surgery and at follow-up (87%; mean 79.7 d). On average, SWM tests were performed two times per patient (one to four times), using the value of the last follow-up for analysis.

Statistics

Wilcoxon tests were used for the comparison of pre- and postoperative values, whereas Mann-Whitney tests were used for all other statistical analysis. Multiple testing corrections were not performed because an exploratory data analysis had been conducted. *P* values were rounded off to four significant digits; *P* values below 0.05 were considered statistically significant. All data were analyzed with GraphPad Prism 9.0 (GraphPad Software, San Diego, Calif.).

RESULTS

All patients were tested at least once. The test was performed on 96 patients at initial presentation. Seventy-three of the 84 patients (87%) who received surgery allowed a postoperative assessment. Thirty-two patients were assessed postoperatively only, whereas in 41 patients, pre- and postoperative sensitivity assessments were performed (Table 1).

Of the 47 patients with either an intact, visible clitoris preoperatively (type Ia/IIa) or an intact clitoris underneath the infibulating scar who were assessed postoperatively (type IIIa/b/c), 44 patients were able to perceive the 2.83 monofilament. Therefore, the perception of a 2.83 monofilament was classified as very good sensitivity.

Preoperatively, the sensitivity of the area directly above the palpable clitoris was assessed among patients without a visible clitoris (type Ib, IIb, and III, n = 76). Among them, 23 patients (30.3%) were able to perceive the 2.83 monofilament in the overlying scar, 44 patients (57.9 %) were able to perceive the 3.61 monofilament, and 9 (11.8%) patients were able to perceive only the 4.31 monofilament.

Postoperatively, the SWM test was performed on 73 patients; of these, 70 patients (95.9%) were able to perceive the 2.83 monofilament, and three patients (4.1%) were able to perceive the 3.61 monofilament. Of the three patients who perceived 3.61 filaments postoperatively, two patients had a type IIIcc mutilation; the third patient (IIIb mutilation) had already perceived 3.61 filaments preoperatively. The postoperative sensitivity did not worsen in any patient compared with the preoperative findings.

As expected, the preoperative clitoral sensitivity in FGM patients with an intact, visible clitoris (n = 20) was significantly better ($P < 0.0001$) compared with that of patients with a mutilated clitoris (type Ib and IIb; n = 41). The same was found when comparing controls preoperatively with both groups of infibulated patients, with and without resection of the clitoral glans (type III, n = 35; $P < 0.0001$; Fig. 2).

A subgroup analysis was performed for patients in whom the SWM-test was performed before and after CR (mean follow-up 39.5 d). Patients with a mutilated clitoris (type IIb, n = 19) showed a significant improvement in clitoral sensitivity after elevation ($P = 0.0020$), reaching sensitivity levels not significantly different from those of patients with an intact clitoris (Fig. 3).

Not surprisingly, we found a significant improvement in clitoral sensitivity after de-infibulation in the group of patients with type III mutilation (n = 22; $P = 0.0001$; **Fig. 4**). Postoperative results of all patients with type III mutilation did not show a significant difference compared with our control group. Both the patients with an intact clitoris underneath the infibulating scar (n = 17) and the patients with a mutilated and reconstructed clitoris (n = 5) showed a postoperative improvement of clitoral sensitivity. The comparison of pre- versus postoperative assessments of patients with an intact clitoris underneath the infibulating

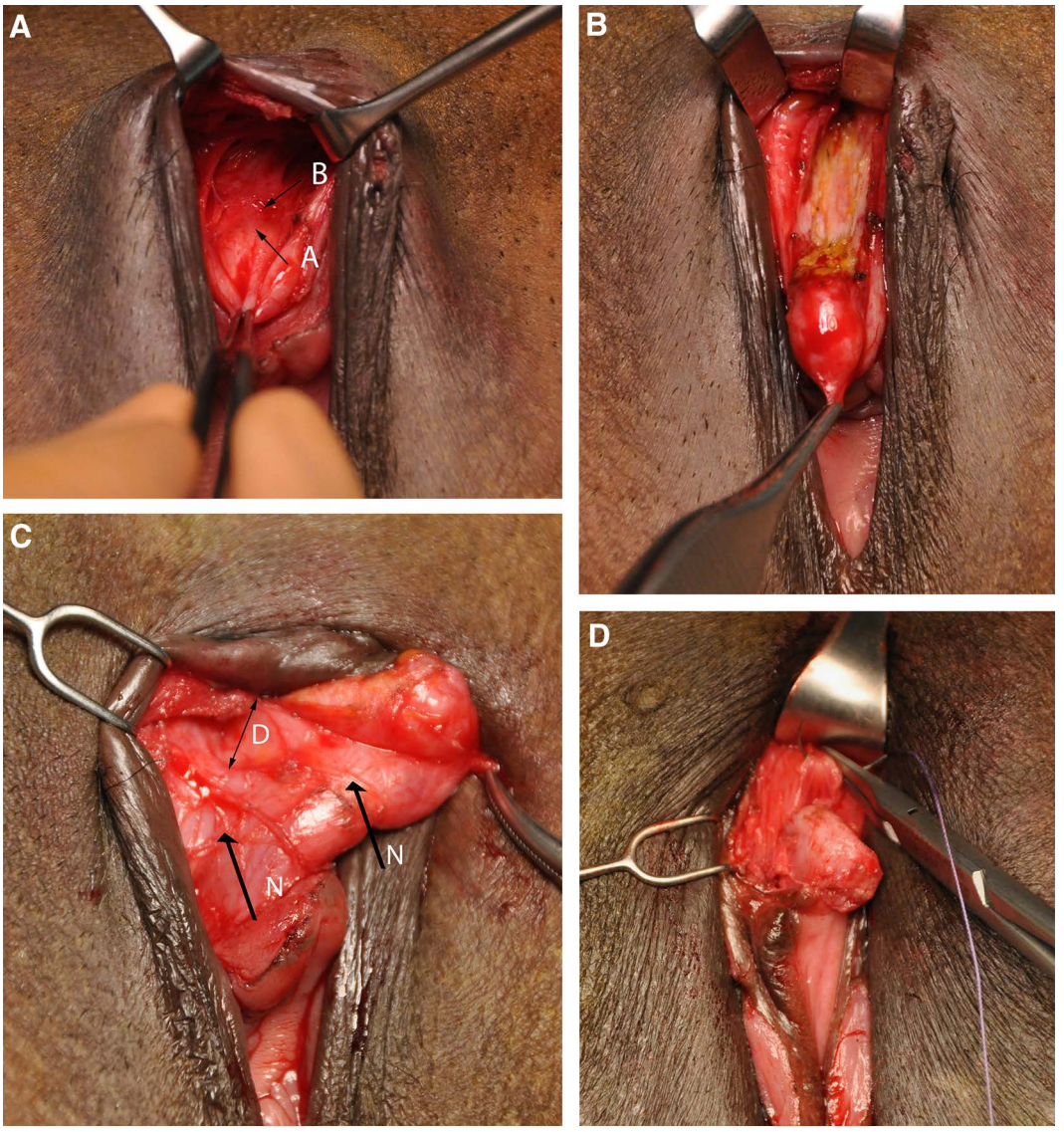

Fig. 1. Reconstructive technique. A, Arrow A indicating the (Köbelt angle) "elbow" of clitoral body with attachment to the major portion of the suspensory ligament (arrow B). B, Dissection of the ligament down to the retro-crural fascia, liberating the body below the fascia while leaving the lateral tissue, containing the neuro-vascular bundle, intact. C, After liberation of the body the distance (D) to the entry point of the clitoral nerves (N) is usually still more than 1 cm. D, Uniting the lateral soft tissue gives enough stability to maintain the achieved projection.

scar (n = 17) was statistically significant ($P = 0.0078$), and the comparison of pre- versus postoperative assessments of patients with a mutilated clitoris underneath the infibulating scar showed a P value of 0.0625 (Fig. 5).

DISCUSSION

During the past years, the benefits and limitations of CR have been subject of debate, with different institutions having diverging views[21,22,26,33] due to its potential risks such as bleeding, postoperative pain, or loss of sensation due to damage caused to the clitoral nerves and vessels.

Although some studies have evaluated the long-term outcomes such as sexual function,[9,25,34–37] an objective and standardized analysis of clitoral sensitivity in FGM victims after CR is currently lacking.

Because sexual function is influenced by many factors, our analysis did not aim to describe the merits of CR in improving sexual function. Instead, we focused on evaluating the clitoral sensitivity after clitoral elevation using the standard technique currently used by most surgeons, to analyze the potential risk of harming the residual sensory function.[23]

Various techniques to assess clitoral function have been used, including vibration, pressure, and stretch sensation. However, the SWM test has been proved to be a valid tool in the assessment of the postoperative integrity of the nerve structures in the genital region.[31,32]

We evaluated the clitoral sensitivity in women with an intact clitoris compared with patients with a mutilated clitoris and infibulated patients, showing significantly better

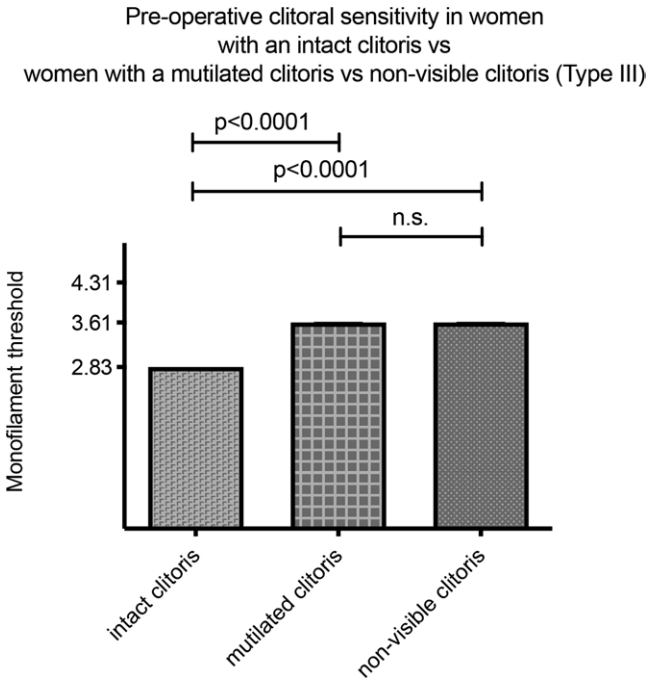

Fig. 2. Preoperative clitoral sensitivity in women with an intact clitoris (type Ia/IIa mutilation) compared with patients with a mutilated clitoris (type Ib/IIb mutilation) and infibulated patients with a nonvisible clitoris (type III mutilation) using the Semmes-Weinstein-monofilament test. Data presented as median with interquartile range.

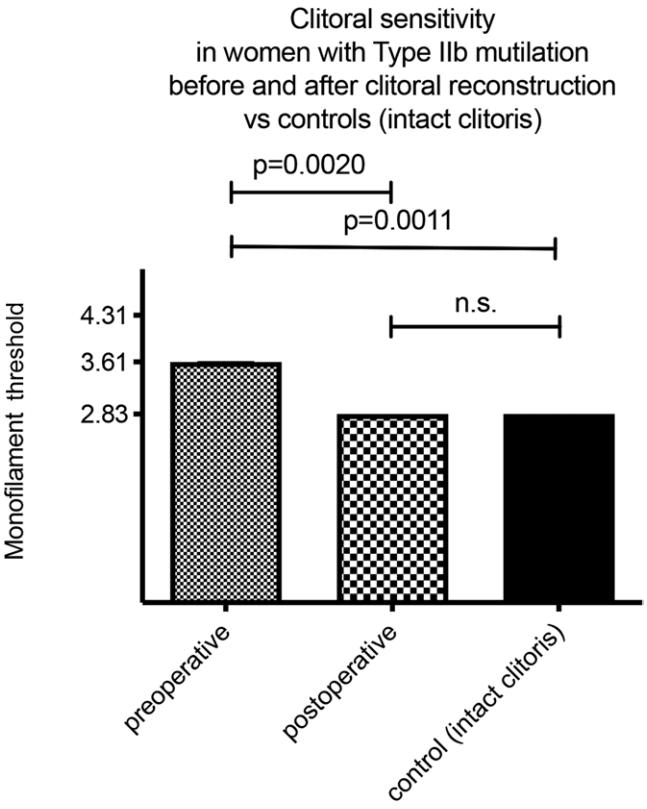

Fig. 3. Clitoral sensitivity in women with a mutilated clitoris (type IIb mutilation) before and after CR compared with patients with an intact clitoris (controls/patients with type Ia and IIa mutilation). Data presented as median with interquartile range.

sensitivity in women with an intact clitoris compared with women with a mutilated clitoris or infibulation before reconstruction.

Furthermore, in a subgroup analysis of patients with a mutilated clitoris in whom the SWM test was performed before and after CR, we have shown a significant improvement in clitoral sensitivity.

Interestingly, Cordeau et al[32] showed a mean light-touch clitoral detection threshold of 2.38 when measuring the clitoral sensitivity in 30 healthy women aged between 18 and 35 years using SWM. In our study, 70 of 73 patients (95.9%) showed the same postoperative sensitivity as patients with an intact clitoris. Notably, no patient was found to experience diminished sensitivity compared with her preoperative finding.

The present WHO classification of type III mutilations does not allow for discrimination between cases with or without clitoral involvement, hampering comparability of studies.[27] We, therefore, used a modified staging by considering the intraoperative finding.[15,28] (**See table, Supplemental Digital Content 1**, **http://links.lww.com/PRSGO/D235**.) (**See table, Supplemental Digital Content 2**, **http://links.lww.com/PRSGO/D236**.)

Regardless of a mutilated or intact clitoris underneath the infibulating scar, preoperative sensitivity was found to be significantly lower compared with our control group. A slightly, though not significantly, better clitoral sensitivity was preoperatively found in patients with type III mutilation having an intact clitoris compared

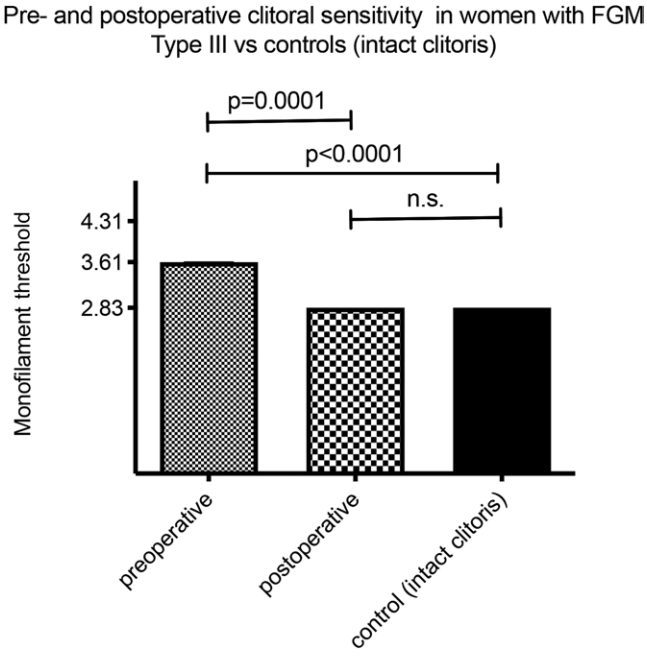

Fig. 4. Clitoral sensitivity in all patients with type III mutilation (patients with intact and mutilated clitoris underneath the infibulation scar) after de-infibulation compared with patients with an intact clitoris (controls/patients with type Ia and IIa mutilation). Data presented as median with interquartile range.

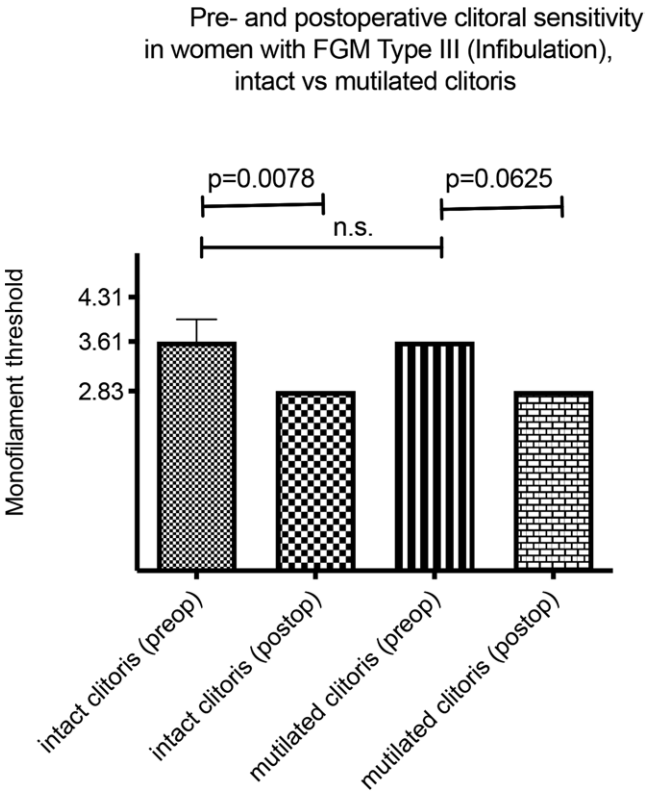

Fig. 5. Pre- and postoperative clitoral sensitivity in patients with type III mutilation with an intact and mutilated clitoris after de-infibulation. Both groups show improvement of sensitivity. Data presented as median with interquartile range.

with patients with a mutilated clitoris underneath the infibulating scar (Fig. 5).

Not surprisingly, we have shown that, after de-infibulation, the sensitivity of patients with type III mutilation with an unharmed clitoris underneath the infibulating scar was as good as the clitoral sensitivity of our control group. Patients with an intact clitoris underneath the infibulating scar and patients with a mutilated and reconstructed clitoris both showed postoperative improvement in clitoral sensitivity. In the case of an overlying scar (type Ib/IIb/III), a direct evaluation of the clitoral threshold was not possible, showing a limitation of the assessment method. Even though the sensitivity was tested above the palpable clitoral body, the result might be flawed due to potentially testing the sensitivity of the scar rather than of the clitoris. This could explain the very good sensitivity in 23 patients who were able to perceive the 2.83 monofilament preoperatively. However, it can be assumed that these results tend to underestimate the resulting pressure reaching the clitoris below, suggesting that the difference after elevation would be even more obvious.

To improve sensitivity, it has been suggested to transpose the dorsal clitoral nerves into the clitoral tip.[12] However, cadaveric studies have shown that the dorsal clitoral nerve divides into two or more on average 0.5-3-cm-long cords at a mean distance of 1.0–2.5 cm to the

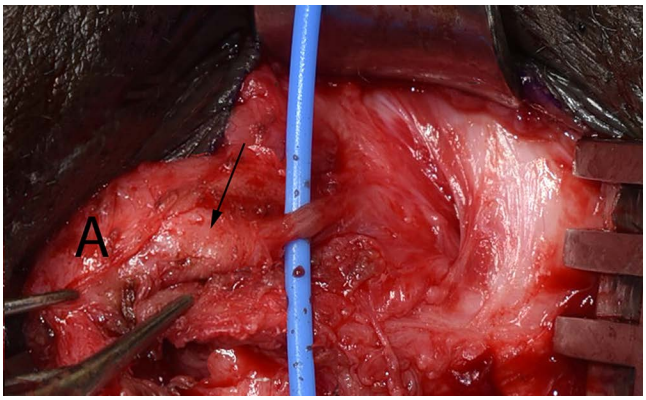

Fig. 6. Histologically confirmed neuroma (arrow) with positive Tinel sign and neuropathic pain after clitoral nerve dissection and transposition under the tunica albuginea at the time of CR. This patient was not part of the presented study group. A = clitoral body.

tip of the clitoral glans, thus dividing and fanning out before reaching its distal end.[38–40] These observations support our findings, which show that, even though the clitoral glans is resected, there are sufficient nerve branches to maintain a normal sensitivity of the clitoral body. Because a transposition of the dorsal clitoral nerves does not conform to the anatomy of the clitoris, we decided against it. Dividing the otherwise functional nerve also bears the potential risk of neuroma formation and is not in keeping with contemporary concepts of physiological mechanisms of peripheral nerve regeneration and neurotisation.[41–43] Our results suggest that almost all patients could reach the sensitivity thresholds of healthy women with an unaffected clitoris. Therefore, extending the surgical procedure beyond clitoral elevation does not seem to be beneficial and bears the risk of further damaging the delicate structures (Fig. 6).

With respect to long-term outcomes, Foldès et al[23] found that most patients report an improvement or no change in pain (98%) and clitoral pleasure (98%). After 1 year, they reported that 51% of the patients had experienced orgasms. However, Ouedraogo et al[35] did not find a significant change in the ability to achieve orgasm before and after surgery, which might be explained by the fact that the etiology of female orgasmic disorder is multifactorial, depending also to a large extent on psychological factors. Because most of the clitoris is still intact after FGM,[4] it is argued that FGM victims can experience a satisfying sexual life.[20] Nevertheless, Foldès et al[23] showed that orgasm rates almost tripled. However, in a subgroup analysis of 53 FGM patients, who reported regular orgasms before CR, 12 reported a reduction in orgasms after CR, which might lead to the conclusion that CR in patients who do not experience orgasmic dysfunction should be indicated with care.

In this context, in a meta-analysis, Berg et al[9] also reported a deterioration of sexual function in 22% of the women with FGM who underwent genital reconstruction. Furthermore, they showed that de-infibulation had low social acceptance and that approximately one-third of the women were dissatisfied with the new

appearance of their genitalia, thus possibly causing distress.[44] Jordal et al[25] demonstrated in a series of structured interviews that, even though patients expressed satisfaction and disappointments following surgery, they experienced physical, sexual, and psychosocial benefits of the surgery.

The high rate of women not satisfied with their postoperative results detected in the meta-analysis of Berg et al could, however, be reduced by a thorough preoperative multidisciplinary history and clinical examination as well as frankness about the achievable results. Most authors suggest that ideally, women with FGM should be seen by a multidisciplinary team consisting of a surgeon, a psychologist-psychotherapist, a sexologist, and a social worker, if required, to evaluate the benefit of surgery versus psychological and sexual counseling.[3,6,20,25]

This is of importance because impaired sexual function in FGM victims[4,5] is not always a consequence of FGM, and is often related to psychological comorbidities caused or triggered by rape, war, or forced marriage.[3,20]

A limitation of the study is the limited number of patients in some of the subgroups. However, although CR has often been criticized due to its potential complications such as bleeding or loss of sensation,[45] we were able to prove that almost all our patients showed clitoral sensitivity equal to unharmed women, even without specifically addressing the clitoral nerves. Clitoral sensitivity is an important aspect but not the only parameter assessing sexual function, although being an essential part of female sexuality. Nevertheless, in our opinion, the remaining nerve functions maintain the clitoral sensitivity.

Another limitation of the preoperative sensory assessment in the subgroup of type III mutilations is the perceptible threshold measured on the scar directly above the palpable clitoris, instead of the clitoris itself. But, even though a potential flaw, the result will rather underestimate the required pressure to trigger the clitoris. However, we present the first objective assessment of clitoral sensitivity after reconstruction in a large cohort, including a control group.

Thus, although it is obvious that our study will not refute all objections, our results show overall positive results after CR. To reach a final conclusion regarding the benefits and harms of CR, further studies focusing on women's satisfaction with genital appearance and sexual function after different reconstruction techniques are required.

CONCLUSIONS

Clitoral sensitivity improves significantly after CR in patients with type IIb mutilation and after deinfibulation in patients with type III mutilation. Postoperatively, 95.9% of the patients showed the same sensitivity as patients with an intact clitoris. No patient reported a reduced sensitivity after the procedure compared with the preoperative finding. Therefore, our study supports the argument that CR without additionally addressing clitoral nerves offers sufficient improvement of objective clitoral sensitivity.

Careful patient selection by a multidisciplinary team is advisable. Even though clitoral re-elevation was found to be a safe procedure with marked improvement in the perceived sensitivity, some women with FGM might benefit more from psychosexual counseling than from surgery.

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DISCLOSURES

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REFERENCES

1. UNICEF. 2020 Global annual report: eliminating female genital mutilation during COVID-19. Available at https://www.unicef.org/reports/2020-annual-report-female-genital-mutilation-covid19. Published 2020. Accessed February 22, 2024.
2. Piroozi B, Alinia C, Safari H, et al. Effect of female genital mutilation on mental health: a case-control study. *Eur J Contracept Reprod Health Care.* 2020;25:33–36.
3. Wulfes N, von Fritschen U, Strunz C, et al. Cognitive-emotional aspects of post-traumatic stress disorder in the context of female genital mutilation. *Int J Environ Res Public Health.* 2022;19:4993.
4. Abdulcadir J, Botsikas D, Bolmont M, et al. Sexual anatomy and function in women with and without genital mutilation: a cross-sectional study. *J Sex Med.* 2016;13:226–237.
5. Thabet SM, Thabet AS. Defective sexuality and female circumcision: the cause and the possible management. *J Obstet Gynaecol Res.* 2003;29:12–19.
6. De Schrijver L, Leye E, Merckx M. A multidisciplinary approach to clitoral reconstruction after female genital mutilation: the crucial role of counselling. *Eur J Contracept Reprod Health Care.* 2016;21:269–275.
7. Catania L, Abdulcadir O, Puppo V, et al. Pleasure and orgasm in women with female genital mutilation/cutting (FGM/C). *J Sex Med.* 2007;4:1666–1678.
8. Akinbiyi T, Langston E, Percec I. Female genital mutilation reconstruction for plastic surgeons—a call to arms. *Plast Reconstr Surg Glob Open.* 2018;6:e1945.
9. Berg RC, Taraldsen S, Said MA, et al. The effectiveness of surgical interventions for women with FGM/C: a systematic review. *BJOG.* 2018;125:278–287.
10. Foldes P, Louis-Sylvestre C. [Results of surgical clitoral repair after ritual excision: 453 cases]. *Gynecol Obstet Fertil.* 2006;34:1137–1141.
11. O'Dey DM. [Complex vulvar reconstruction following female genital mutilation/cutting]. *Urologe A.* 2017;56:1298–1301.
12. O'Dey DM, Kameh Khosh M, Boersch N. Anatomical reconstruction following female genital mutilation/cutting (FGM/C). *Plast Reconstr Surg.* 2023 [E-pub ahead of print].
13. Mañero I, Labanca T. Clitoral reconstruction using a vaginal graft after female genital mutilation. *Obstet Gynecol.* 2018;131:701–706.
14. Niranjan N. Perforator flaps for perineal reconstructions. *Semin Plast Surg.* 2006;20:133–144.
15. Fritschen, UV. Reconstructive options. In: von Fritschen U, Strunz C, Scherer R, eds., *Female Genital Mutilation: Medizinische*

Beratung und Therapie Genitalverstümmelter Mädchen und Frauen. Berlin/Boston, Ma.: De Gruyter; 2020.
16. O´Dey, D. *Vulvar Reconstruction following Female Genital Mutilation/Cutting (FGM/C) and other Acquired Deformities*. Berlin: Springer; 2019.
17. Chang CS, Low DW, Percec I. Female genital mutilation reconstruction: a preliminary report. *Aesthet Surg J*. 2017;37:942–946.
18. Calvert C AT, Nathan S, Percec I. Buccal mucosa grafts for reconstruction in patients with female genital mutilation. *Plast Reconstr Surg Glob Open*. 2019;7:139.
19. Clitoraid. Restoring a sense of dignity and pleasure. Available at https://www.clitoraid.org/why-clitoraid. Accessed February 22, 2024.
20. Sharif Mohamed F, Wild V, Earp BD, et al. Clitoral reconstruction after female genital mutilation/cutting: a review of surgical techniques and ethical debate. *J Sex Med*. 2020;17:531–542.
21. NHS. Clinical commissioning policy statement: genital surgery to improve clitoral sensation for women who have undergone female genital mutilation. Available at https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/01/e10-surgcl-trt-fgm.pdf. Published 2015. Accessed February 22, 2024.
22. RCOG. Female genital mutilation and its management, RCOG green-top guideline no.53. Available at https://www.rcog.org.uk/media/au0jn5of/gtg-53-fgm.pdf. Published July 2015. Accessed February 22, 2024.
23. Foldes P, Cuzin B, Andro A. Reconstructive surgery after female genital mutilation: a prospective cohort study. *Lancet*. 2012;380:134–141.
24. Paslakis G, Farre JM, Tolosa-Sola I, et al. Clinical features associated with female genital mutilation/cutting: a pilot longitudinal study. *J Clin Med*. 2020;9:2340.
25. Jordal M, Sigurjonsson H, Griffin G, et al. The benefits and disappointments following clitoral reconstruction after female genital cutting: a qualitative interview study from Sweden. *PLoS One*. 2021;16:e0254855.
26. Jordal M, Akhavan S, Wahlberg A. Surgical healthcare interventions after female genital mutilation/cutting—a review of the evidence. *Clin Exp Obstet Gynecol*. 2022;49:136.
27. WHO. Types of female genital mutilation. Available at https://www.who.int/teams/sexual-and-reproductive-health-and-research-(srh)/areas-of-work/female-genital-mutilation/types-of-female-genital-mutilation. Accessed February 22, 2024.
28. von Fritschen U, Strunz C, Scherer R, et al. Postoperative course of reconstructive procedures in FGM type III-proposal for a modified classification of type III female genital mutilation. *Int J Environ Res Public Health*. 2023;20:4439.
29. Blayney F, Camuzard O, Klein A, et al. Anatomical study of the clitoris and its implications on female genital mutilation and surgical repair. *J Plast Reconstr Aesthet Surg*. 2021;74:3394–3403.
30. Di Marino, V., Lepidi, H. Innervation of the bulbo-clitoral organ. In Di Marino V, Lepidi H, eds. *Anatomic Study of the Clitoris and the Bulbo-clitoral Organ*. Cham: Springer International Publishing; 2014:71–80.
31. Romanzi LJ, Groutz A, Feroz F, et al. Evaluation of female external genitalia sensitivity to pressure/touch: a preliminary prospective study using Semmes-Weinstein monofilaments. *Urology*. 2001;57:1145–1150.
32. Cordeau D, Bélanger M, Beaulieu-Prévost D, et al. The assessment of sensory detection thresholds on the perineum and breast compared with control body sites. *J Sex Med*. 2014;11:1741–1748.
33. WHO. Guidelines on the management of health complications from female genital mutilation. Available at https://www.who.int/publications/i/item/9789241549646. Published June 2016. Accessed February 22, 2024.
34. Mestre-Bach G, Tolosa-Sola I, Barri-Soldevila P, et al. Clinical, sexual and psychopathological changes after clitoral reconstruction in a type II female genital mutilation/cutting: a case report. *Afr J Reprod Health*. 2019;23:154–162.
35. Ouedraogo CM, Madzou S, Toure B, et al. [Practice of reconstructive plastic surgery of the clitoris after genital mutilation in Burkina Faso. Report of 94 cases]. *Ann Chir Plast Esthet*. 2013;58:208–215.
36. Vital M, de Visme S, Hanf M, et al. Using the Female Sexual Function Index (FSFI) to evaluate sexual function in women with genital mutilation undergoing surgical reconstruction: a pilot prospective study. *Eur J Obstet Gynecol Reprod Biol*. 2016;202:71–74.
37. Christopher AN, Othman S, Morris MP, et al. Clinical and patient-reported outcomes of 19 patients undergoing clitoral and labial reconstruction after female genital mutilation/cutting. *Aesthetic Plast Surg*. 2022;46:468–477.
38. Vaze A, Goldman H, Jones JS, et al. Determining the course of the dorsal nerve of the clitoris. *Urology*. 2008;72:1040–1043.
39. Baskin LS, Erol A, Li YW, et al. Anatomical studies of the human clitoris. *J Urol*. 1999;162:1015–1020.
40. Gordon V, Rowe J, Grubb L, et al. Mapping a danger zone of the dorsal nerve of the clitoris: implications in female cosmetic genital surgery. *Plast Reconstr Surg*. 2021;148:1005–1010.
41. Abdulcadir J, Tille JC, Petignat P. Management of painful clitoral neuroma after female genital mutilation/cutting. *Reprod Health*. 2017;14:22.
42. Weng T, Wu P, Zhang W, et al. Regeneration of skin appendages and nerves: current status and further challenges. *J Transl Med*. 2020;18:53.
43. Adidharma W, Khouri AN, Lee JC, et al. Sensory nerve regeneration and reinnervation in muscle following peripheral nerve injury. *Muscle Nerve*. 2022;66:384–396.
44. Berg RC, Taraldsen S, Said MA, et al. Reasons for and experiences with surgical interventions for female genital mutilation/cutting (FGM/C): a systematic review. *J Sex Med*. 2017;14:977–990.
45. Sigurjonsson H, Jordal M. Addressing female genital mutilation/cutting (FGM/C) in the era of clitoral reconstruction: plastic surgery. *Curr Sex Health Rep*. 2018;10:50–56.