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The Relationship Between Female Genital Cutting and Obstetric Fistulas

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Abstract

Objective—To evaluate any association between female genital cutting and vesicovaginal fistula formation during obstructed labor.

Methods—A comparison was made between 255 fistula patients who had undergone Type I or Type II female genital cutting and 237 patients who had not undergone such cutting. Women were operated on at the Barhirdar Hamlin Fistula Centre in Ethiopia. Data points used in the analysis included age, parity, length of labor, labor outcome (stillbirth or not), type of fistula, site, size and scarring of fistula, outcomes of surgery (fistula closed, persistent incontinence with closed fistula, urinary retention with overflow, site, size, and scarring of any rectovaginal fistula and operation outcomes, as well as specific methods employed during the operation (utilization of a graft or not, application of a pubococcygeal or similar autologous sling, vaginoplasty, catheterization of ureters, and flap reconstruction of vagina). Primary outcomes were site of genitourinary fistula and persistent incontinence despite successful fistula closure.

Results—The only statistically significant differences between the two groups ($p = 0.05$) was a slightly greater need to place ureteral catheters at the time of surgery in women who had not undergone a genital cutting operation, and slightly higher use of a pubococcygeal sling at the time of fistula repair and a slightly longer length of labor (by 0.3 of a day) in women who had undergone genital cutting.

Conclusion—Type I and Type II female genital cutting are not independent causative factors in the development of obstetric fistulas from obstructed labor.

Obstetric fistula is a catastrophic childbirth injury that currently afflicts as many as 3.5 million women in Africa and Asia, with up to 130,000 new cases occurring each year (1). In the vast majority of cases, obstetric fistulas are caused by ischemic necrosis of the tissues of the vesico-vaginal septum which are trapped between the mother's boney pelvis and the presenting fetal part (usually the head). In parts of the world without prompt access to emergency obstetric care, women may remain in obstructed labor for three or four days (or longer) without delivery (2, 3). After delivery (usually of a stillborn child) the necrotic tissue sloughs away to reveal the fistula.

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Female genital cutting (also commonly referred to as either “female circumcision” or “female genital mutilation”) refers to “all procedures involving partial or total removal of the external female genitalia or other injury to the female genital organs for non-medical reasons” (4). Such practices are common in traditional cultures throughout much of sub-Saharan Africa. The World Health Organization classifies these cutting procedures into four main groups (4). Type I genital cutting consists of partial or total removal of the clitoris and/or the prepuce (clitoridectomy). Type II procedures involve partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora (excision). The most extensive mutilation (Type III or “infibulations”) narrows of the vaginal orifice and creates a covering seal by cutting and appositioning the labia minora and/or the labia majora, often involving excision of the clitoris as well. Type IV (miscellaneous operations) include all other harmful genital procedures carried out for non-medical purposes, such as pricking, piercing, incising, scraping and cauterization.

Over the past 20 years female genital cutting has undergone increasingly critical scrutiny because of the adverse health consequences suffered by the affected women and the human rights implications entailed by the continuance of such practices (5, 6). As a result of this increasing attention, the belief has arisen in some quarters that the eradication of female genital mutilation would also eliminate obstetric fistula (5, 7). Only a small number of studies have looked at potential linkages between female genital cutting and women’s reproductive health (8–17). Our study directly addresses the presumed association between female genital cutting and obstetric fistula formation. Our objective was to evaluate any association between female genital cutting and vesicovaginal fistula formation during obstructed labor.

It has long been taught that the level at which obstruction occurs during labor determines the site at which the fistula will subsequently develop (1, 18). Thus, if labor becomes obstructed at the pelvic brim, the resulting ischemic necrosis will occur in this area and the vesico-vaginal fistula that results should be high in the pelvis, perhaps in a juxtacervical location. In similar fashion, if labor becomes obstructed at the pelvic outlet, necrosis would occur lower down in the reproductive tract and the fistula should appear closer to the urethra. Because female genital cutting Types I–III involve the external genitalia, if scarring from these procedures is the cause of obstructed labor, passage of the fetus through the pelvis should be normal until it reaches the level of the pelvic outlet. Fistulas that result from external genital scarring should therefore be found extremely low in the pelvis and a high proportion of these fistulas should involve the urethra. One would also expect to find more urethral damage in fistula patients who had been subjected to previous female genital cutting. The main predictor of persistent urinary incontinence following fistula closure has also been shown to be the presence of urethral injury (19–23). Thus, if female genital mutilation is a major cause of obstetric fistula formation there should also be a higher proportion of women with persistent urinary incontinence among those who have been subjected to such cutting procedures. If the obstruction was caused by scarring of the outlet and introitus rather than by obstruction against the bones higher in the pelvis, examination of a large series of cases might show differences in the initial presentation of the fistulas as well as differences in subsequent surgical outcome when comparing cases who have and who have not undergone genital cutting procedures. This paper examines numerous variables in patients with obstetric fistulas who presented for care at the Barhirdar Hamlin Fistula Centre in northern Ethiopia with respect to the presence or absence of a history of genital cutting.

Materials and Methods

The hospital notes of 1,000 consecutive patients who had been operated on for an obstetric fistula at the Barhirdar Hamlin Fistula Centre in Ethiopia between July 2005 and July 2008

were reviewed. Barhirdar, the capital of Amhara Region, is located 540 kilometers north of Addis Ababa. The Barhirdar Hamlin Fistula Centre is a satellite of the Addis Ababa Fistula Hospital. There is no formal research ethics committee at this hospital; therefore, permission to conduct the case review was obtained from the Barhirdar medical director. Cases were included in the analysis only if there was a definite notation in the chart as to the presence or absence of a prior female genital cutting procedure and only if the fistula was due to prolonged obstructed labor. These procedures were classified clinically according to the WHO system (Box 1). The charts of 492 patients had a definite notation as to whether or not they had undergone female genital cutting: in 255 cases some type of female genital mutilation was present and in 237 cases it was specifically noted that these women had not undergone such a procedure. The prevalence of female genital cutting varies greatly throughout Ethiopia, from an absence of this practice in Gambella to 94% in Afar. In Barhirdar approximately 81% of women have been “circumcised” [24]. In this region of Ethiopia most forms of genital cutting present as intermediate between Types I and II in the WHO classification system; that is, affected women commonly have had the labia minora removed but the clitoris is left intact. At other times the visible mutilation was “typical” for either a Type I or Type II procedure. Because the extent of the scarring was similar in these cases, we compared fistula patients either with or without genital mutilation.

Data-points used in the analysis included age, parity, length of labor, labor outcome (stillbirth or not), type of fistula, site, size and scarring of fistula as described by Goh’s validated fistula classification system (22, 25, 26), outcomes of surgery (fistula closed, persistent incontinence with closed fistula, urinary retention with overflow incontinence, site, size, and scarring of any rectovaginal fistula and operation outcomes, as well as specific methods employed during the operation (utilization of a graft or not, application of a pubococcygeal or similar autologous sling, vaginoplasty, catheterization of ureters, and flap reconstruction of vagina). Four of the patients were excluded from this latter group as they had no bladder remaining to be able to operate upon; one from the non FGC group and three from the FGC group.

We have used sling utilization as a surrogate marker for urethral involvement as slings were employed only for Goh type 3 and type 4 fistulas. Similarly, vaginoplasty is used in this analysis as a surrogate marker for vaginal scarring, as this was only necessary in patients with moderate to severe vaginal scarring. Flap reconstruction of the vagina was used only when there was extensive vaginal loss and is also a surrogate marker for extensive vaginal loss. Ureteral catheterization (or not) reflects the position of the fistula in relation to the trigone/ureteric orifices. Catheterization was necessary only if the ureters were close to the edge of the fistula.

Our primary outcomes of interest, site of genitourinary fistula and persistent incontinence despite successful fistula closure, were used to determine the power for this analysis. For site of genitourinary fistula we had 80% power and for persistent incontinence our power was 86% to detect a difference of 5%, assuming alpha of 0.05. Power was estimated using nQuery Advisor v.7.0 (Statistical Solutions, Saugus, MA). Statistical analyses were conducted using SAS v. 9.1 (SAS Corporation, Cary, NC). Continuous measures were compared using Student’s t-test. Categorical variables were initially compared using either a chi-square or Fisher’s exact test. Relative risks associated with site of genitourinary fistula and persistent incontinence were estimated using Poisson regression with robust error variance. This analytic approach is appropriate in a cross-sectional study when a binary outcome is common (27).

Results

Detailed statistical comparisons are presented in Tables 1–4. In all measured parameters the only significant differences between fistula patients with and without exposure to genital cutting was a slightly greater need to catheterize the ureters at the time of surgery in women who had not undergone genital cutting and slightly higher use of a pubococcygeal sling at the time of fistula repair and a slightly longer (0.3 days) length of labor in patients who had undergone genital cutting. We also estimated relative risks for our primary outcomes, site of genitourinary fistula (RR = 0.93, 95% CI 0.85, 1.02) and persistent incontinence (RR 0.92, 95% CI 0.82, 1.03). These results were essentially unchanged after adjustment for the potential confounding effects of age, parity, and days in labor.

Discussion

There is a widespread popular belief that female genital cutting predisposes women to the development of obstetric fistulas (5–7), but little direct evidence substantiates this belief. Several authors have looked at obstetric outcomes among immigrant women in European countries who had undergone genital cutting procedures (8, 14, 16). Some of these studies have not found any differences in prolonged labor, need for forceps or cesarean delivery, fetal distress, or perinatal deaths when African immigrants are compared to non-cut European women delivering at the same institutions (8, 16). Although infibulated women (Type III cutting) require anterior episiotomy/defibulation at the time of delivery, in one Swedish study such women actually had shorter labors than did the non-cut Swedish controls (16).

Several studies from Africa show increases in obstetric complications—mainly perineal lacerations and/or stillbirths---among women who have undergone genital cutting operations (11, 13). The World Health Organization recently completed at prospective study of delivery outcomes among 28,393 women with singleton pregnancies attending for delivery at 28 obstetric centers in Burkina Faso, Ghana, Kenya, Nigeria, Senegal and Sudan according to the presence of absence and type of genital cutting present (17). This study concluded that adverse outcomes increased according to the severity of the genital cutting with significant increases in the risk for cesarean section, postpartum hemorrhage, episiotomy, extended maternal hospital stay, and the need for infant resuscitation at delivery. Female genital cutting appeared to lead to one or two additional perinatal deaths per 100 deliveries in these countries. Unfortunately, this study contained no data on obstetric fistulas.

Our study specifically examines the possible relationship between female genital cutting and obstetric fistula formation. We do not find any clear differences in the presentation, site, size and degree of scarring in obstetric fistulas occurring in women who have undergone Type I or Type II genital cutting procedures compared to women with obstetric fistulas who have not been cut in this way. Although we found *statistical* significance (each with a p value of 0.05) in the need for ureteral catheterization in women who had a fistula but who had not been cut and the need for a a pubococcygeal sling at the time of fistula repair in women who had undergone a genital cutting procedure, we do not believe that either of these findings are of practical *clinical* significance. Geographic review of patient origins suggests that the slightly longer length of labor found in patients who had undergone genital cutting was due to their living in more remote locations, further away from medical help.

Surgical outcomes do not differ according to whether or not the woman has previously undergone female genital cutting, and physical examination gives the clear clinical impression that the amount of scarring left by Type I and Type II cutting procedures would not cause a prolonged obstructed labor. Both of these observations suggest that Type I and

Type II genital cutting do not contribute to obstetric fistula formation during obstructed labor. Furthermore, statistical modeling using data from demographic and health surveys carried out in Malawi, Rwanda, Uganda, and Ethiopia have not found evidence that genital cutting contributes to fistula formation from obstructed labor (28).

Our data are insufficient to show whether or not Type III genital cutting (infibulation) contributes to obstructed labor and fistula formation, and further research on this topic is warranted. The common assumption is that increased scarring at the introitus produced by more radical forms of genital cutting could cause a delay in the second stage of labor which, in turn, might lead to an increased risk of fistula formation. Women who have undergone Type III procedures usually require defibulation at the time of delivery (9, 29) and data from Saudi Arabia on infibulated women suggest that they have a longer second stage during labor and an increased risk of post-partum hemorrhage; however, they do not appear to require cesarean section more often than non-infibulated women (9, 29). Delivery data on infibulated immigrant Somali women now living in industrialized countries show higher rates of cesarean and operative vaginal delivery, as well as increased risks of perineal laceration and post-partum hemorrhage than do non-immigrant women of the receiving countries (31–33). The reasons for these differences are unclear. Some authors suggest that poor communication and a lack of familiarity with special issues raised during the delivery of these women explains much of the increased perineal trauma and higher rates of cesarean section in these studies (33, 34). In some case defibulation itself may create a fistula: at Barhirdar two to three patients are seen each year who have undergone Type III genital cutting and who present after labor with a fistula that has obviously been caused by a traditional birth attendant cutting open both the infibulated genitalia and the urinary tract at the time of delivery.

Although there is no clear mechanical association between Type I and Type II female genital cutting and obstetric fistula formation from obstructed labor, it is very clear that obstetric fistulas are prevalent in culture-areas where genital cutting practices are also common. Rather than being a cause of obstructed labor, we believe that female genital cutting is a marker for the presence of other important risk factors that combine to promote obstetric fistulas (1). Fistulas are found where the socio-economic status of women is low, where early marriage is common and pregnancy occurs before pelvic growth is complete, where women's personal autonomy is highly restricted, where contraceptive choice is limited or non-existent and fertility is high, where women are largely uneducated and have little political power, where transportation is difficult and the medical infrastructure is inadequately developed so that timely access to emergency obstetric services is poor and those services are often of marginal quality. Together these factors combine to produce high levels of maternal mortality and obstetric morbidity, of which the obstetric fistula is a common and tragic component. It should not be surprising that female genital cutting is commonly found within this same social milieu. Although the eradication of female genital cutting is desirable from the standpoints of both women's health and human rights, the elimination of these traditional genital operations will not eliminate the obstetric fistula as a complication of childbirth. Accomplishing this will require the presence of a trained attendant during every labor and timely, universal access to competent emergency obstetric services worldwide.

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Table 1

Characteristics of patients with obstetric fistula with and without FGC

Patient variables	No FGC 237	FGC present 255	P- value
Age in years, mean (SD)	28.2 (9.4)	28.7 (9.9)	0.57
Parity, mean (SD)	3.1 (2.8)	2.7 (2.3)	0.08
Days in labour, mean (SD)	2.8 (1.5)	3.1 (1.7)	0.04
Time since delivery (months), mean (SD)	38.5 (75.4)	46.3 (82.6)	0.28
Stillbirth			0.84
No	15	15	
Yes	221	238	
Blanks	1	2	
Type of fistula			0.33*
VVF only	219	228	
RVF only	3	8	
Both present	15	19	

*Calculated using Fisher's exact

Table 2

Characteristics of patients with VVF (VVF alone and VVF and RVF)

Characteristics	No FGC 234	FGC present 247	P-value
Site of genitourinary fistula			0.19
Not involving urethra (Goh type 1)	93 (39.7%)	84 (34%)	
Involving the urethra (Goh types 2–4)	141 (60.3%)	163 (66%)	
Size of genitourinary fistula			0.34
<1.5cm (Goh a)	110 (47%)	105 (42.5%)	
1.5–3cm (Goh b)	57 (24.4%)	56 (22.7%)	
>3cm (Goh c)	67 (28.6%)	86 (34.8%)	
Scarring			0.13
None or mild, vaginal length >6cm (Goh i)	131 (56%)	127 (51.4%)	
Mod to severe, vaginal length <6cm (Goh ii)	24 (10.3%)	17 (7.9%)	
Circumferential or repeat case (Goh iii)	79 (33.7%)	103 (41.7%)	
Result of operation			0.51*
Closed fistula	228 (97.5%)	236 (95.5%)	
Fistula not closed	5 (2.1%)	8 (3.3%)	
Bladder not operated (no bladder remaining)	1 (0.4%)	3 (1.2%)	
Persistent incontinence with closed fistula hospital	n=228	n=236	0.15
No	182 (79.8%)	175 (74.2%)	
Yes	46 (20.2%)	61 (25.8%)	
Urinary retention	n=228	n=236	0.64
No	211 (92.5%)	221 (93.6%)	
Yes	17 (7.5%)	15 (6.4%)	

*Calculated using Fisher's exact

Table 3

Characteristics of patients with RVF (isolated RVF and combined)

Characteristics	No FGC 18	FGC present 27	P-value
Site of RVF (%)			1.0 *
>3.5cm from hymen (Goh Type 1)	4 (22.2%)	7 (26%)	
<3.5cm from hymen (Goh types 2–4)	14 (77.8%)	20 (74%)	
Size of RVF			0.26 *
<1.5cm (Goh a)	3 (16.7%)	11 (40.7%)	
1.5–3cm (Goh b)	7 (38.9%)	7 (26%)	
>3cm (Goh c)	8 (44.4%)	9 (33.3%)	
Scarring of RVF			0.24 *
None or mild, vaginal length >6cm (Goh i)	5 (27.8%)	3 (11.1%)	
Mod to severe, vaginal length<6cm, circumferential or repeat (Goh ii and iii)	13 (72.2%)	24 (88.9%)	
Result of RVF operation			N/A
Closed fistula	18	27	
Fistula not closed	0	0	

* Calculated using Fisher's exact

Table 4

Comparison of surgical methods

VVF operated n=477 Surgical methods	No FGC 233	FGC present 244	P- value
Graft			1.0 *
No	230	241	
Yes	3	3	
Muscle sling			0.05
No	165	152	
Yes	68	92	
Ureters catheterized			0.05
No	186	176	
Yes	47	68	
For all operations, RVF. VVF and both n=488	**n=236**	**n=252**	
Vaginoplasty			0.58
No	183 (77.5%)	190 (75.4%)	
Yes	53 (22.5%)	62 (24.6%)	
Flap vaginal reconstruction			0.55
No	229 (97%)	242 (96%)	
Yes	7 (3%)	10 (4%)	

* Calculated using Fisher's exact