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CLINICAL ARTICLE

Characteristics and surgical success of patients presenting for repair of obstetric fistula in western Kenya

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ABSTRACT

Objective: To carry out a large-scale retrospective review of patients who had undergone surgical repair of obstetric fistula in Kenya to determine patient characteristics and determinants of successful surgical repair. *Methods:* The patient records of 483 surgical repairs of obstetric fistula treated by a single surgeon (H.M.) between January 2005 and July 2010 at 3 medical centers in western Kenya were retrospectively reviewed. Descriptive and bivariate statistical analyses were performed. *Results:* Young women with some primary or no education and prolonged labor at the time of first delivery were most highly correlated with obstetric fistula formation. Success of fistula closure was 86% for first-time vesicovaginal fistula (VVF) repairs and 67% for first-time VVF combined with rectovaginal fistula (RVF) repairs. Among women who had previously attempted VVF or combined VVF/RVF repairs, 73% and 50% of fistulas, respectively, were repaired successfully. First-time repair was significantly associated with surgical success compared with patients with a history of previous repair attempts ($P=0.027$). *Conclusion:* Among Kenyan women presenting for fistula repair, fistula most was most highly correlated with a low level of education and prolonged labor. The findings are consistent with results reported from other countries in Sub-Saharan Africa.

1. Introduction

Fistulas involving the female genital tract are associated with significant morbidity among women who lack access to timely obstetric care. Estimates suggest that there are 30 000–130 000 new cases of vesicovaginal fistula (VVF) in Africa each year [1]. Furthermore, at least 3 million women are predicted to be living with unrepaired VVF and/or rectovaginal fistula (RVF) in resource-poor countries worldwide owing to an immense backlog of surgical repair, which is performed by too few physicians [1].

The circumstances that most frequently precipitate genitourinary fistula in resource-poor countries are a combination of prolonged obstructed labor and lack of access to emergency obstetric care (EmOC) [2,3]. Obstructed labor is characterized by the arrest of fetal passage through the pelvic brim and wedging of the fetal parts between the bones of the pelvis by the force of uterine contractions. Compression of the pelvic soft tissues causes widespread vascular injury, tissue necrosis, and sloughing, leading to the formation of an obstetric fistula [3]. This abnormal opening allows communication between the vagina and bladder (VVF), vagina and rectum (RVF), or both (or less commonly between the vagina and urethra, ureters, or multiple pelvic structures), resulting in continuous urinary and/or fecal incontinence [3]. Cephalopelvic disproportion is a common finding in obstructed labor events in countries such as Kenya, where a high prevalence of sociodemographic and health status factors including malnutrition, disease, and early marriage contribute to small physical stature in women [4].

In addition to fistula formation, women who experience obstructed labor are at risk for numerous other physical consequences, including peroneal nerve injury leading to foot drop, amenorrhea, and vaginal stenosis. Women living with obstetric fistula also face extensive social struggles. Divorce, malnutrition, stigmatization, isolation, depression, and deepening poverty are common among women with fistulas [5,6]. These devastating physical and social consequences define the "obstructed labor injury complex" [5].

Obstetric fistula is a preventable and treatable condition if timely and universal access to obstetric care and surgical repair are available. In 2004, the United Nations Population Fund (UNFPA) conducted an assessment of obstetric fistula needs in Kenya as part of their campaign to end fistula in 50 resource-poor countries across Africa and Asia [7]. Poverty, long distances to maternity facilities, inaccurate obstetric knowledge, and Kenya's rugged landscape were identified as major barriers to prevention of obstetric fistula. A cultural preference to deliver with unskilled birth attendants (>50% of women receive unskilled attendance at delivery), a lack of adequate EmOC in medical centers and hospitals, minimal partograph use, and weak referral

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systems were also identified as significant obstacles to appropriate care [7]. The UNFPA identified that fistula occurs as a result of 3 delays in receiving appropriate EmOC: delay in deciding to seek medical attention, delay in reaching a healthcare facility, and delay in receiving EmOC at the facility [7].

There is a trend in characteristics described for the fistula patient population in low-income countries. The patient with obstetric fistula typically is of short stature and young age; is extremely poor, divorced, and a primigravida; and has an index labor lasting more than 2 days [2,6,8–11]. The first attempt at repair is most successful, with rates of closure approaching 90%; early surgical repair after injury also improves success [2,6,8–11].

A recent study examining the surgical repair of women with obstetric fistula in Kenya provided insight into the characteristics of patients within this context [12]. In particular, McFadden et al. [12] identified an association between patients with large fistulas and previous failed surgeries with unsuccessful surgical repair. Nevertheless, many issues have not been addressed among the Kenyan population, including an investigation of factors such as age, parity, and type of attendant at index delivery; geographic determinants; and fistula type and its impact on surgical outcome.

The aim of the present study was to understand better both the characteristics of patients presenting with obstetric fistula and the determinants of successful repair among a large, multicenter study population in order to improve approaches to the primary prevention and treatment of women with obstetric fistula in a national and regional context.

2. Materials and methods

In a retrospective study, medical records were reviewed from all women who underwent surgical repair of obstetric fistula by a single surgeon (H.M.) between January 1, 2005, and July 31, 2010, at 3 medical centers in western Kenya (Ortum Mission Hospital, Rift Valley Province; New Nyanza Provincial General Hospital, Nyanza Province; and Moi Teaching and Referral Hospital, Rift Valley Province). Clinical management of the patients was conducted according to the practice of the surgeon (H.M.); local institutions completed postoperative care according to established protocols. The Moi University Institutional Research and Ethics Committee, Eldoret, Kenya, and the University of Toronto Research Ethics Board, Toronto, Canada, granted approval for the study (approval #000187 and #24419, respectively).

Patient records of fistulas involving the female genital tract were identified, and physicians, nurses, medical students, and clinical officers trained in data collection by the study surgeon (H.M.) conducted chart abstractions by using a standard data collection tool. Data tools were stored in locked cabinets in a secured office. Patient sociodemographic characteristics, medical and surgical history, concurrent lesions, classification of fistula, method of repair, and postoperative outcomes were recorded. Surgical success was defined by a negative methylene blue dye test at 2 weeks after surgery. Each surgical repair was entered as a de-identified, numbered, electronic record in an Access 2007 database (Microsoft, Redmond, WA, USA). Associated identifying data were entered into a password-protected database. A single investigator (L.H.) performed electronic data entry. For quality assurance, another investigator (H.M.) reviewed 5% of entries.

The criteria for inclusion in the study were all surgical repairs of VVF, RVF, or combined VVF/RVF of obstetric cause undertaken by a single surgeon (H.M.). Fistulas of non-obstetric cause were excluded.

Categoric data were presented as proportions; continuous data were presented as the mean and standard deviation (SD) by using Excel 2007 (Microsoft). To assess the relationship between successful closure of repair and type of fistula present or patient history of repair attempts, Fisher exact test was used because of the expected small cell count. A *t* test was performed to examine the characteristics associated with successful closure of repair. Both Fisher exact tests and *t* tests were performed with Stata 2009 version 11 (StataCorp, College Station, TX, USA). Many medical records were incomplete; known values were used for computations. Statistical significance was defined at a *P* value of less than 0.05.

3. Results

Among 556 medical records reviewed, 483 met the inclusion criteria and were used in data analysis. Sociodemographic, delivery, and fistula characteristics are described in Table 1. The median age of women with fistula development was 20 years (interquartile range [IQR], 7 years). Fifty-six percent of patients had developed fistula at the time of their first delivery, and the same proportion of patients had no formal education. The median distance of a patient's home to a maternity facility was 16 km (IQR, 24.5 km). Forty-two percent of patients delivered in the presence of a traditional birth attendant (TBA). All multiparous women in the study sample were delivered by unskilled personnel. The perinatal outcome of the fetus was documented for 303 patients, among whom 76% of deliveries resulted in stillbirth or immediate neonatal death, and 24% in liveborn neonates. The fistulas among this group of patients were classified by the Waaldijk system [11] (Table 2).

Among the 483 surgeries reviewed, 445 procedures were for VVF repair, 19 for RVF repair, and 19 for combined VVF/RVF repair. Of those repairs for which the number of previous repairs was recorded (305 of 483 repairs), 75% were first-time repair. Among patients who underwent VVF repair only, 86% of first-time repair attempts were successful. Seventy-three percent of fistulas were successfully closed among patients who had a history of previous surgical repair attempts. A significant difference in surgical success was found between these 2 groups of patients ($P=0.027$; Table 3). For 67% of women with combined VVF/RVF undergoing first-time repair and 50% of those with a history of unsuccessful repair surgery, the fistula was closed successfully (Table 3).

Successful and unsuccessful first-time VVF repairs are compared in Table 4. By *t* test, these 2 groups showed no significant difference in age at onset, age at repair, height, weight, parity at onset, duration of labor, or age at first pregnancy. A comparison of distance to maternity facility showed a longer mean distance for the unsuccessful group, although the difference did not reach significance ($P=0.054$). Fisher exact test for mode of delivery, birth attendant, perinatal outcome, education, marital status, and Waaldijk fistula classification showed no significant difference between the 2 groups. Province of residence produced a marginally significant result ($P=0.051$).

4. Discussion

Women living with obstetric fistula carry significant burdens in the absence of care. In Kenya, the African Medical and Research Foundation has reported an obstetric fistula incidence of 3000 new cases per year (1–2 cases per 1000 deliveries) with only 7.5% of patients receiving treatment [7]. The backlog of women yet to receive surgical management is difficult to measure in Kenya, but undeniably immense [13]. Patients in the present study experienced a delay as long as 39 years from the time of obstetric fistula development to reparative surgery. Furthermore, the burden of fistula cases far exceeds the number that can be repaired. This deficiency is a consequence of inadequate resources, skills, and time available to appropriately address the problem [7]. FIGO, in collaboration with UNFPA and other partners, recently published the Global Competency-based Fistula Surgery Training Manual [14]. This standardized training program aims to enable physicians to prevent and treat obstetric fistulas, and therefore addresses the long-recognized need for more fistula surgeons [14].

In the present study, 483 cases of surgical VVF, RVF, and combined VVF/RVF were assessed. Women with obstetric fistula were young