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## CLINICAL ARTICLE

## Impact of a program of physiotherapy and health education on the outcome of obstetric fistula surgery

Yves-Jacques Castille<sup>a,\*</sup>, Chiara Avocetien<sup>b</sup>, Dieudonné Zaongo<sup>c</sup>, Jean-Marie Colas<sup>d</sup>, James O. Peabody<sup>e</sup>, Charles-Henry Rochat<sup>f,g</sup><sup>a</sup> Rehabilitation Department, Cliniques Universitaires St Luc, Brussels, Belgium<sup>b</sup> Rehabilitation Department, Hôpital St Jean de Dieu, Tanguiéta, Bénin<sup>c</sup> Gynecology Department, Hôpital St Jean de Dieu, Tanguiéta, Bénin<sup>d</sup> Urology Department, Polyclinique du Parc, Dole, France<sup>e</sup> Vattikui Urology Institute, Henry Ford Hospital, Detroit, USA<sup>f</sup> Urology Department, Clinique Générale Beaulieu, Geneva, Switzerland<sup>g</sup> Albert Einstein College of Medicine, New York, USA

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## ABSTRACT

**Objective:** Surgery is the only successful treatment for most obstetric fistulae. The present study measured the impact of a structured program of pre- and postoperative physiotherapy and health education on the outcome of surgery for obstetric fistula. **Methods:** We compared the postoperative outcomes of 2 consecutive groups of women with obstetric fistulae who were recruited and followed-up by 2 local nongovernmental organizations at a hospital in Tanguiéta, Benin. The first group of women (n = 99) had fistula repair using standardized techniques. The second group (n = 112) had a standardized surgical approach plus a structured program of pre- and postoperative health education and physiotherapy. **Results:** The program had a significant positive impact on recovery in general and on urinary incontinence in particular. After physiotherapy, the odds of recovery were 2.72 times greater for women in the physiotherapy group than for control patients, and the probability of post-operative stress incontinence was considerably higher for patients in the control group than for those in the physiotherapy group ( $P < 0.001$ ). **Conclusion:** A structured program of health education and physiotherapy by experienced nurses and physiotherapists improves the likelihood of a successful outcome after surgical repair of obstetric fistula.

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## 1. Introduction

An obstetric fistula is usually the result of an injury that occurs during a birth complicated by prolonged or obstructed labor. Tissue ischemia resulting from compression of the head of the child results in a hole between the woman's genital tract and her urinary tract and/or rectum [1]. The location, size, and complexity of these fistulae can vary widely. They can be vesicovaginal, rectovaginal, ureterovaginal, or uterovaginal. Within the bladder, fistulae can be juxta-urethral, midvaginal, or juxtacervical, and they frequently involve the continence mechanism. They can be classified as simple or complex and single or multiple [2]. There is no real consensus about the classification of obstetric fistulae. Capes et al. [3] compare the 2 most commonly used systems, the Waaldijk [4] and Goh [5] classifications.

Whereas the prevalence of this problem is almost zero in industrialized countries because of good access to perinatal care, in low-income

countries it is still very common, especially in Sub-Saharan Africa and South East Asia [4,5]. The annual incidence is estimated to be between 50 000 and 100 000 women worldwide. The prevalence may be over 2 000 000 women [6]. These estimates are felt to be low by some authors because of difficulties in obtaining accurate data from remote areas where the problem is more likely to occur, but it shows the importance of this disease in terms of public health.

The consequences of living with an obstetric fistula are multiple and often severely disabling for the woman, not only for her physical integrity but also her emotional, psychological, familial, and social well-being. The experience of living with a fistula has a negative impact on a woman's identity. Sometimes a woman with a fistula is accused of being "negligent" and is told that this has led to the death of her child and the development of her "disease." Often she is repudiated by her husband, rejected by her village, and doomed to try to survive on her own. This can lead to social isolation and even mortality; "I am nothing" [7] is the feeling that women living with an obstetric fistula have.

The ultimate solution to obstetric fistulae is prevention through better prenatal care and better access to emergency obstetric care, especially timely cesarean delivery. Over the long term, it will be universal access to emergency obstetric services, along with better family planning,

\* Corresponding author at: Rehabilitation Department, Cliniques Universitaires St Luc, Avenue Hippocrate, 10 at 1200 Brussels, Belgium. Tel.: +32 1 0474503; fax: +32 1 0473106.

E-mail address: yves.castille@uclouvain.be (Y.-J. Castille).

education of girls and women, economic development, and gender equality that will decrease the rate of obstetric fistulae in resource-poor regions to that in the industrial world [8,9].

For women with an established fistula that has not resolved with a trial of urinary catheterization, the only solution is surgery that attempts to close the fistula and, if necessary, to repair and reinforce the continence mechanism. Healing (closure of the fistula and return of continence) is not always obtained after a first attempt especially for more complex fistulae, and reoperations may have lower success rates than initial repairs. The success of the operation depends on many factors such as the degree of scarring and tissue loss, the size and location of the fistula, and the surgeon's experience. The final procedure for some women when all else fails is a diversion using either the Mainz II or the ureterosigmoidostomy technique.

We believe that the failure of some repairs is attributable to a lack of knowledge by women about their situation, resulting in particular in mismanagement of abdominal pressure especially in the early postoperative days.

Handicap International, a nongovernmental organization (NGO) headquartered in Brussels, Belgium, aims to support the rehabilitation and return to society of disadvantaged populations. During field visits, Handicap International experts often encounter women with an obstetric fistula. The organization is eager to improve the care of these women and therefore commissioned our group to undertake the present study.

## 2. Materials and methods

At the Hospital of St Jean de Dieu in Tanguiéta, Benin, surgical missions to repair obstetric fistulae are held 4 times per year. The patients are recruited by 2 NGOs: Sentinelles, a Swiss NGO that works in south-eastern Burkina Faso; and Essor, a Beninese NGO that works mainly in the northern part of Benin, northwest Niger, and east Togo. These NGOs receive considerable financial support from the United Nations Population Fund and the Geneva Foundation for Medical Education and Research to enable the women to benefit from the program. During the preoperative phase, the women live in a camp located 3 km from the hospital. Facilitators from the NGOs organize the women's visits to the hospital, where they receive health education and physiotherapy instructions.

Because of the situation in Tanguiéta, a randomized study of this intervention would have been difficult to conduct. We therefore performed a prospective study to compare 2 consecutive groups of patients (Table 1). The study was approved by the ethics committee of St Jean de Dieu Hospital and the leaders of both NGOs. The participants, most of whom were illiterate, provided verbal informed consent.

The first cohort of women was seen between November 1, 2009, and January 31, 2011. This group received usual care with details of the surgery dictated by the extent of the fistula (control group). The second

group was seen between March 1, 2011, and March 31, 2012. These women received the same usual care augmented by a program of health education and physiotherapy (study group).

During the first mission, nurses from the 2 NGOs were trained in quality of life assessment using the Ditrovie scale [10]. This is a validated scale in French to assess the quality of life of patients with urinary symptoms. It consists of a questionnaire with 10 items scored from 1 to 5 exploring 5 dimensions: activity (4 items), emotional impact (2 items), self-image (2 items), sleep (1 item), and general welfare (1 item). A score of 1 indicates that the situation is slightly embarrassing and a score of 5 indicates extreme embarrassment.

The quantity of urine loss was measured in both groups by a 1-hour pad test, following the recommendations of the International Continence Society (1983) [11].

Our hypothesis was that surgical success is determined not only by technical factors and the anatomy and complexity of the fistula, but also by factors that women can control: activities of daily living, such as coughing or defecation, that increase abdominal pressure. A program of health education and management of abdominal pressure through physiotherapy was tested to try to reduce to a minimum the harmful effects of these pressures on postoperative recovery. The nursing staff received theoretical and practical training on how to manage patients, especially in the early phase after surgery (Table 1).

Before surgery, the women in the study group participated in several group sessions at camp and individual sessions at the physiotherapy ward to learn various techniques to reduce abdominal pressure during everyday activities.

These didactic sessions were held in collaboration with the nurses from the NGOs who provided screening, hospital accompaniment, and follow-up of the women. In addition to assisting in the training aspect of these sessions, the nurses also helped by translating instructions and corrections into the languages and dialects spoken by the women. All instructions were also shown on posters (Fig. 1), which were displayed in all places where the women stayed. Copies were given to each NGO to be used for postoperative follow-up visits.

Specific physiotherapy support was provided by a physiotherapist who was trained in abdominopelvic care/perineology. The women attended 2 preoperative sessions. During the first session, they received basic information on perineal functionality, followed by an initial bio-feedback session with a vaginal probe (Myomed 932; Enraf-Nonius, Rotterdam, The Netherlands). The women were taught to perform perineal contractions for 5 seconds followed by a rest period of 10 seconds. Finally, a basic hypopressive exercise was taught and we insisted on compliance with preventive behaviors represented on the poster. The women were instructed to repeat the exercises for 10 minutes twice per day. The second physiotherapy session was a review of how the women performed the exercises. An optional third session was organized for women who needed an additional review and training.

After surgery, the women were hospitalized for approximately 1 week and were then discharged to the fistula camp with a urinary catheter for 10–14 days. They received further physiotherapy sessions and then returned for a clinical examination to determine whether the fistula was healed and their continence restored.

Further follow-up was carried out at 3, 6, and 12 months by the nurses from the NGOs. In addition, most socially isolated women were offered vocational training and/or microcredit to ensure their income allowed them to have an acceptable economic and social life.

Significant differences between groups were evaluated with the *t* test or the nonparametric Wilcoxon rank test as appropriate. Logistic regression analysis was performed to assess the probability of recovery (fistula cured or incontinence) versus non-recovery (failed repair or urinary diversion). Variables included in the model were group assignment and number of previous fistula surgeries, given that successful repair is dependent on the number of previous surgeries a woman has undergone. Odds ratios were calculated to compare the probability of recovery between the groups. All results were computed

**Table 1**  
Timeline of the study.

Date	Study-related activity
November 2009	First surgical mission for the control cohort Training of nurses in applying the Ditrovie scale Quantification of urine loss by a physiotherapist
March 2010	Evaluation of early results together with local partners Encouragement of local teams to provide postoperative follow-up
March 2011	First surgical mission for the study cohort Training of a physiotherapist specializing in perineology Training of nurses in techniques to assess the strength of the surrounding abdominal wall Implementation of the program of health education and physical therapy
March 2012	Collection and evaluation of all data collected during the preceding year
March 2013	Collection and evaluation of all data collected during the preceding year Final analysis



Fig. 1. Poster about prevention of abdominal hyperpressure and protection of the perineum.

using JMP 9 (SAS Institute, Cary, NC, USA).  $P < 0.05$  was considered statistically significant.

### 3. Results

From November 2009 to January 2011, 143 women came to the hospital for the fistula missions. Of these, 24 had urinary stress incontinence, 1 had enuresis, 1 required revision of ureterosigmoidostomy, 3 had previous urinary incontinence surgery, and 1 had urinary bladder prolapse. Fourteen medical folders were incomplete. A total of 99 patients met the criteria to be in the control group.

From March 2011 to March 2012, 135 women came to the hospital for the fistula missions and received perioperative education and physiotherapy. Of these women, 14 had urinary stress incontinence, 1 had enuresis, 1 had undergone previous urinary surgery, 1 had a cervical tumor, and 1 had a urinary bladder prolapse. Five medical folders

were incomplete. Overall, 112 patients met the criteria to be in the study group.

The countries of residence of the women are detailed in Table 2. The 2 groups were comparable before treatment in terms of age, number of deliveries, number of living children, total number of previous fistula surgeries, entry pad test results, and Ditrovie score (Table 3).

The mean Ditrovie score for the overall study population was 37.3 of 50 (Table 4). The tenth item—“Given your urinary problems, how would you rate your quality of life?”—was the item that received the highest score (mean score 4.6 of 5), indicating that the fistulae had a severe impact on the women’s quality of life. The minimum score for this item was 3. No woman considered her situation as excellent or good. By contrast, items 3 and 4 received the lowest scores (2.8 and 2.9,

**Table 2**  
Country of residence of the study population.<sup>a</sup>

Country	Control group (n = 99)	Study group (n = 112)	Total (n = 211)
Benin	65 (65.7)	83 (74.1)	148 (70.1)
Burkina Faso	25 (25.3)	25 (22.3)	50 (23.8)
Togo	5 (5.1)	1 (0.9)	6 (2.8)
Nigeria	3 (3.0)	3 (2.7)	6 (2.8)
Ghana	1 (1.0)	0 (0.0)	1 (0.5)

<sup>a</sup> Values are given as number (percentage).

**Table 3**  
Details of the study population.

Parameter	Control group (n = 99)	Study group (n = 112)
Age, y	37.0 (14–70)	35.5 (14–70)
Number of deliveries	4.3 (1–13)	4.0 (1–15)
Number of living children	1.9 (0–10)	1.6 (0–10)
Number of previous surgeries	1.6 (1–5)	1.9 (1–5)
Entry pad test results		
Loss, g	119.7 (0–698)	98.6 (1–517)
Urinated volume, mL	46.2 (0–363)	26.8 (0–445)
Ditrovie scale score	39.2 (25–50)	39.4 (26–49)

<sup>a</sup>Values are given as mean (range).

**Table 4**  
Quality of life as rated on the Ditrovie scale.<sup>a</sup>

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total score
Minimum score	1	1	1	1	1	1	1	1	1	3	25
Maximum score	5	5	5	5	5	5	5	5	5	5	50
Mean score	3.5	3.5	2.8	2.9	4.3	4.5	3.7	4.0	3.7	4.6	37.3

<sup>a</sup> Regarding your urinary problems during the past 4 weeks:

- Q1: Did they obstruct you when you were outside your home?
- Q2: Did they trouble you when going to the market?
- Q3: Did they trouble you when wearing something heavy?
- Q4: Did you have to frequently interrupt your work or daily activities because of them?

During the past 4 weeks, because of your urinary problems, how often:

- Q5: Have you felt a sense of shame, of degradation?
- Q6: Were you afraid you might smell bad?
- Q7: Did you lose patience?
- Q8: Were you afraid to leave your home?
- Q9: Have you been forced to get up several times during the night?

Global evaluation:

- Q10: Given your urinary problems, how would you rate your quality of life?

respectively), indicating that carrying heavy weights and work interruptions because of urinary problems were not so much of a problem.

In the control group, 57 (57.6%) operations were successful, 35 (35.4%) procedures failed, and 7 (7.1%) women went on to have a urinary diversion. In the physiotherapy group, 77 (68.8%) operations were successful, 29 (25.9%) procedures failed, 2 (1.8%) women went on to have a urinary diversion, and 4 (3.6%) dropped out for psychological and/or emotional reasons.

The likelihood of recovery was 1.2 times higher (relative risk 1.19; 95% CI 0.96–1.47; Wald test  $P = 0.047$ ) for women who received physiotherapy than for those in the control group. The odds ratio of recovery was 2.72 (95% CI, 1.30–5.93;  $P = 0.008$ ) for women in the physiotherapy group, compared with control patients.

The parameter estimate for the group effect was negative, meaning that the probability of recovery was lower for women in the control group than for women in the physiotherapy group ( $P < 0.05$ ).

The number of previous surgeries also had an impact on outcome. Moreover, the probability of recovery decreased with an increasing number of previous surgeries, but the decrease was not statistically significant ( $P = 0.068$ ).

Finally, for women whose fistula was closed after surgery, the health education and physiotherapy program significantly reduced the risk of urinary stress incontinence after surgery; 30 (52.6%) women with successful surgery in the control group and 17 (22.1%) women in the physiotherapy group continued to have urinary stress incontinence (Fisher exact test  $P < 0.001$ ).

#### 4. Discussion

Obstetric fistulae can vary in duration, age, location, severity, size, involvement of the continence mechanism, and scarring and quality of the involved tissues. One of the main causes of surgery failure is operative dehiscence, but severe residual stress incontinence has a similar negative impact on patient satisfaction.

The present study addressed the question of whether a program of health education and simple intervention by a physiotherapist can reduce the number of surgery failures and improve the outcome after surgical repair. It demonstrated a beneficial effect of these 2 interventions on the results of vesicovaginal fistula surgery. The improvement was statistically significant both in terms of fistula healing and in terms of urinary incontinence frequency.

Physiotherapy (management of abdominal pressure and pelvic floor training) and health education sessions had a positive influence on the outcome of surgery with no adverse effects. However, many other parameters on which physiotherapy has no effect also influence the outcome after surgery.

The physiotherapy and health education program had an important effect on continence recovery as shown by comparison with the control group. For women whose fistula is closed but who remain incontinent, the situation remains unsatisfactory and these women often do not see the benefit of a closed fistula. In the great majority of cases, the continued leakage is attributable to stress incontinence that had previously been masked by the presence of the fistula. The most common reason for stress incontinence in such circumstances is damage to the continence mechanism during birth and involvement of the urethra in the fistula. However, stress incontinence is also common after a normal vaginal delivery.

The effectiveness of physiotherapy in this situation is well established. Pelvic floor training and abdominal wall management are therefore essential measures before surgery for women who initially present with incontinence. Other solutions such as palliative measures can also be effective. Brook and Tessema [12] recommend the use of a urethral plug if the bladder is large enough and the urethra is not too broad. However, this might not be feasible for women who live in remote areas.

Obstetric fistulae represent a major public health challenge and should be a global healthcare priority during the next decade. Surgery is the only option for the many women who are affected by obstetric fistulae. The operation is often difficult because of the anatomical location, the quality of the tissues encountered, involvement of the closure mechanism, and—in some women—previous repair attempts. Most authors agree that the risk of failure increases with an increasing number of previous surgical attempts [13].

The training of surgeons in this field and the establishment of specialized referral centers [14] equipped for obstetric fistula surgery are necessary and remain a priority. Other simple steps should also be taken to reduce the risk of surgical failure. The overall care of these women will undoubtedly be improved by adequate nursing and support by a physiotherapist who is trained in techniques that address this type of pathology.

#### Conflict of interest

The authors have no conflicts of interest.

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