

## Urinary incontinence following obstetric fistula repair

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**Author contributions:** All the authors contributed to this manuscript.

**Conflict-of-interest statement:** No financial disclosures or conflict of interest.

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**Received:** June 28, 2015

**Peer-review started:** July 5, 2015

**First decision:** September 17, 2015

**Revised:** January 26, 2016

**Accepted:** February 14, 2016

**Article in press:** February 16, 2016

**Published online:** May 10, 2016

### Abstract

Prolonged and/or obstructed labour is the most common cause of genital tract fistula world-wide, in particular, sub-Saharan Africa and parts of Asia where emergency obstetric services are unavailable or suboptimal to afford timely delivery of the baby. This results in pressure

necrosis by the fetal presenting part at the level of the obstruction in the maternal pelvis. Other reasons for obstetric fistula include trauma from vaginal deliveries (spontaneous or instrumental) and iatrogenic from cesarean section/hysterectomy. The majority of women develop the fistula during their first labour and most babies are stillborn. Women with a fistula suffer from leakage of urine and/or faeces from the vagina and surgery is the treatment for an established fistula. Long-term complications of fistulas include recurrent fistula, urinary incontinence, reproductive dysfunction, sexual dysfunction, mental health dysfunction, social isolation and orthopaedic complications such as footdrop. Ongoing urinary symptoms are not uncommon after successful fistula closure. There are various reasons for residual urinary incontinence following obstetric fistula repair including urinary stress incontinence, overactive bladder, mixed urinary incontinence and voiding dysfunction. Urinary incontinence after fistula repair requires careful evaluation prior to further surgery, as in some diagnoses, continence surgery is unlikely to treat and may worsen the condition. Initial results from educational and physiotherapy programs demonstrated a positive impact on post-fistula incontinence.

**Key words:** Urinary incontinence; Obstetric fistula

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**Core tip:** About one quarter of women suffer from residual urinary incontinence after surgical closure of genito-urinary fistula. Women with ongoing urinary incontinence usually complain of continuous urinary leakage and recurrent fistula requires exclusion. Women with fistulas involving the urethra are more likely to have ongoing urinary symptoms. Causes of ongoing urinary incontinence after fistula closure include urodynamic stress incontinence, detrusor overactivity (DO) and voiding dysfunction. Synthetic slings have a high rate of complications in these cases. Suboptimal success from surgery may be due to undiagnosed or untreated DO and marked reduction in urethral function.

Goh JTW, Krause H. Urinary incontinence following obstetric fistula repair. *World J Obstet Gynecol* 2016; 5(2): 182-186  
Available from: URL: <http://www.wjgnet.com/2218-6220/full/v5/i2/182.htm> DOI: <http://dx.doi.org/10.5317/wjog.v5.i2.182>

## INTRODUCTION

Obstetric fistula is the most common cause of female genito-urinary fistula world-wide. Prolonged or obstructed labour results in pressure necrosis of the genital tract and surrounding tissues and this creates abnormal communications between the vagina and lower urinary tract and/or vagina and rectum/anus. Uncontrolled leakage of urine and/or faeces from the vagina ensues.

Iatrogenic injuries at time of cesarean section/hysterectomy may also result in fistulas, including uretero-vaginal fistulas. Other causes include vaginal injury from spontaneous or instrumental vaginal deliveries.

The management of an established fistula is surgical. However, in spite of anatomical closure of the genito-urinary fistula, ongoing urinary incontinence may persist. Other complications of obstetric fistula include vaginal stenosis, sexual dysfunction, anal incontinence, infertility, ameorrhoea, chronic pain, calculi (vaginal/renal tract), social isolation and mental health dysfunction.

The aim of this paper is to review post-fistula urinary incontinence, its risk factors, possible causes and treatment.

## OBSTETRIC FISTULA - DEMOGRAPHICS

Obstetric fistula from pressure necrosis occurs as a result of the lack of effective emergency obstetric services. It is a common condition in low-income countries, in particular sub-Saharan Africa. The true rate of obstetric fistula is unknown. Women, especially in remote areas, may have limited access to health care due to the lack of infrastructure and poverty or may not have permission from their family/husband to seek assistance<sup>[1]</sup>. Under-reporting may also occur because women are too embarrassed and socially isolated by their condition, do not realize that treatment is available or do not know where to go for treatment<sup>[2,3]</sup>. In 2011, the Ugandan Bureau of Statistics Demographic and Health Survey demonstrated that 2% of Ugandan women complained of symptoms of genital tract fistula<sup>[3]</sup>. Other reported risks of obstetric fistula include early age of marriage/childbearing and poor nutritional status.

The average length of labour for the woman with an obstetric fistula is 3-4 d and the majority developed the fistula during the first delivery<sup>[4,5]</sup>. During the delivery that was associated with the development of the fistula, over 90% of babies delivered were stillborn<sup>[4]</sup>. It is often difficult to ascertain the true age of the women. Many do not know their date of birth and age due to illiteracy and the tendency to relate time to significant events in

their lives rather than the calendar.

## COMPLICATIONS FOLLOWING OBSTETRIC FISTULA

Anatomical closure of the genital tract fistula should no longer be considered a "cure" as many other functional, social and mental health issues require consideration. McConnachie *et al*<sup>[6]</sup> in 1958 suggested that cure should only be considered when there is complete urinary continence. Complications of obstetric fistula include ongoing incontinence (urinary/faecal), mental health dysfunction, sexual dysfunction, reproductive dysfunction, social isolation and orthopaedic considerations (such as footdrop).

Over 95% of women with obstetric fistula screened positive for mental health dysfunction in a validated mental health screening test<sup>[7]</sup>. Factors such as the constant leakage of urine and/or faeces with limited access to continence pads or water together with the delivery of a stillborn baby and social isolation contribute to mental health dysfunction. Following fistula repair, if the woman is continent, the results from mental health screening improved significantly and returned to general population rates<sup>[8]</sup>.

It is not uncommon for women with obstetric fistulas to suffer from vaginal stenosis due to loss of tissue from pressure necrosis and scarring<sup>[9]</sup>. This will in turn affect sexual and reproductive function and may further contribute to the woman's social isolation and affect her re-integration into the community after fistula surgery. The prolonged obstructed labour may also increase the risk of significant blood loss and intrauterine infections, further complicating reproductive function by intrauterine/pelvic adhesions and/or pituitary dysfunction.

## URINARY INCONTINENCE FOLLOWING SUCCESSFUL CLOSURE OF OBSTETRIC GENITO-URINARY FISTULA

In a prospective follow-up of over 900 women with obstetric fistulas, ongoing urinary incontinence occurred in 23.9% of women after successful fistula closure<sup>[4]</sup>. Fistulas associated with significant scarring and the circumferential fistulas were less likely to achieve anatomical closure. A circumferential fistula usually involves the urethra and at times the bladder neck. It is thought to be due to a highly significant obstructed labour as the whole circumference of the urethra is lost to pressure necrosis. Commonly, a genito-urinary fistula involves the anterior vaginal wall and posterior aspect of the urethra/bladder. In the circumferential fistula, however, the anterior vaginal wall, posterior aspect of the urethra plus the anterior portion of the urethra is lost. In other words, the urethra is completely transected, with the distal portion of the urethra

**Table 1 Summary of Classification according to Goh<sup>10</sup> with the 3 parameters**

Type: distance from fixed reference point (external urinary meatus)
Type 1 - distal edge of fistula > 3.5 cm from external urinary meatus
Type 2 - distal edge 2.5-3.5 cm
Type 3 - distal edge 1.5-2.5 cm
Type 4 - distal edge < 1.5 cm
Size: Largest diameter in centimetres
Size a < 1.5 cm
Size b 1.5-3 cm
Size c > 3 cm
Special considerations
Special considerations i - none or mild fibrosis and/or vaginal length > 6 cm, normal capacity
Special considerations ii - moderate or severe fibrosis and/or marked reduction in vaginal length and/or capacity
Special circumstances iii - e.g., post-irradiation, ureteric involvement, circumferential fistula, previous repair

completely separated from the proximal part.

Several classification systems have been proposed for genital tract fistulas. A comparison of 2 classification systems demonstrated the Goh system<sup>[10]</sup> had a significantly better ability to predict fistula closure<sup>[11]</sup>. Using the Goh system in a prospective follow up of over 900 women, it was demonstrated that those with the Type 1 fistula (Table 1) were most likely to be continent and those with the Type 4 fistula were least likely to be continent after successful fistula closure. Those with significant vaginal scarring, the circumferential fistula and larger fistulas were also less likely to be continent<sup>[4]</sup>. There is no association between length of time with obstetric fistula prior to closure and risk of urinary incontinence<sup>[12]</sup>.

There is a paucity of data on urodynamic studies in women following obstetric fistula closure<sup>[5,13]</sup>. In 2002, Murray *et al*<sup>[13]</sup> published the first known paper on urodynamic studies following obstetric fistula in a low-income country. Thirty women with persisting urinary incontinence underwent urodynamic studies with subtracted cystometry. This demonstrated 57% with pure urodynamic stress incontinence (USI), 37% with mixed incontinence and 7% with detrusor overactivity (DO). Thirteen percent of women had voiding dysfunction and on physical examination, 85% had a fixed bladder neck. Continence surgery on a subset of the women with severe stress incontinence demonstrated significant retropubic adhesions with a "drain-pipe" urethra<sup>[14]</sup>.

In 2013, Goh *et al*<sup>[5]</sup> published urodynamic studies on a series of 149 women with residual urinary incontinence after closure of obstetric genito-urinary fistula. Most of the women (77%) complained of continuous urinary incontinence. A fistula was excluded on examination and dye test. Fifteen percent complained of stress urinary incontinence only, 4% complained of overactive bladder only, 3% complained of mixed incontinence and 1% complained of incomplete bladder emptying. Urodynamic testing demonstrated that 49% of these women had USI only, 3% had DO only, 43%

had mixed incontinence and 5% had neither USI nor DO. Seven percent of women had post-void residual urine volumes of 150 mL or more. Uroflowmetry was unable to be performed as the women could not use the commode but preferred to squat on the floor to void. One third (50 women) required digital para-urethral compression to fill the bladder. In other words, 1 in 3 women leaked per urethra in the early stages of filling cystometry without detrusor pressure rise or provocation. Forty-two of these 50 women (84%) complained of continuous urinary incontinence. Another interesting finding was that urethral closure pressures often did not reflect the severity of urinary incontinence. The authors postulated that the pressures may be generated by scarring of a functionless urethra.

## MANAGEMENT OF POST-FISTULA URINARY INCONTINENCE

Unfortunately, many women with post-fistula urinary incontinence have been treated with surgery only, with little consideration given to non-surgical options or diagnoses that are not treated surgically. In other words, the women may be subjected to surgeries that are unlikely to treat and may worsen their urinary symptoms.

As with the management of female urinary incontinence around the world, conservative approaches must be considered. Castille *et al*<sup>[15]</sup> demonstrated a positive impact on post-obstetric fistula incontinence with pre- and post-surgery pelvic floor rehabilitation and educational programs.

DO and voiding dysfunction may also be neglected or misdiagnosed<sup>[5]</sup>. The management of the overactive bladder is primarily with pelvic floor rehabilitation including bladder training/behavior modification and pharmacological agents such as anticholinergic medication. Continence surgery is unlikely to treat and may worsen these conditions.

Goh *et al*<sup>[16]</sup> described the use of urethral plugs for post-fistula urinary incontinence. This has been a useful adjunct in the management of post-fistula urinary incontinence. Women are taught how to use and self-manage the plugs.

Ideally, a multidisciplinary team is required to optimize the management of women with residual urinary incontinence following obstetric genito-urinary fistula repair. Unfortunately, continence nurses and pelvic floor physiotherapists are not readily available even in established fistula units. Pharmacological agents to assist women with overactive bladder symptoms are also limited or unavailable in many instances.

Numerous operations have been described to treat women with residual urinary incontinence following obstetric fistula. Women with Goh Type 4 fistulas (involving the urethra) have been shown to be least likely to be continent<sup>[4]</sup>. Unfortunately, surgeries to treat urinary incontinence following these fistulas have

frustrated fistula surgeons for many years. Mahfouz<sup>[17]</sup> and Moir<sup>[18]</sup> were in agreement that when the fistula involves the whole urethra, functional outcomes were extremely poor. Hamlin *et al*<sup>[19]</sup> employed the gracilis muscle to reinforce the urethra in an attempt to achieve continence.

McConnachie<sup>[6]</sup> first described using bulbocavernosus and levator ani cross-strut muscular slings to treat post-fistula urinary incontinence. This was re-popularised by Browning<sup>[20]</sup> in more recent times.

Carey *et al*<sup>[14]</sup> described the use of rectus fascia pubovaginal sling with retropubic urethrolisis and omental graft to treat women with proven USI. Follow up of a small group of women demonstrated continence in 67% at 14-mo. These women were found to have a fixed bladder neck and open "drain-pipe" urethras and hence the rationale for retropubic urethralysis and omental graft to reduce the risk of retropubic re-adherence of the urethra.

In a larger group of women treated with slings for residual stress incontinence after obstetric fistula, it was concluded that synthetic slings have a 20% risk of erosion and are not indicated in this group of women and the overall risk of iatrogenic fistula is high at 17%<sup>[21]</sup>.

Krause *et al*<sup>[22]</sup> described the use of periurethral polyacrylamide hydrogel for a small group of women with post-fistula stress urinary incontinence. The immediate post-operative results were promising but longer term follow-up is required. It is often difficult to obtain follow up due to a number of reasons including the cost of returning for follow-up and in many places in Africa, violence against women is common and hence follow-up is challenging for fear of personal safety.

Various techniques for urinary diversion have also been described in the literature to treat women with ongoing urinary incontinence. These women however, require ongoing long-term follow up due to the risk of long-term complications such as infections, metabolic abnormalities, ureteral strictures, and stones<sup>[23]</sup>. Therefore, there is much debate about the practicalities and safety aspects of urinary diversion in the low resource setting.

## CONCLUSION

Residual urinary incontinence continues to be a major health issue following the repair of obstetric genitourinary fistula. There are various reasons other than USI for ongoing urinary incontinence such as DO and voiding difficulty, where continence surgery is unlikely to treat and may worsen the problem. Fistula surgeons should be aware of these other conditions and should carefully select women for further surgery in the treatment of ongoing urinary incontinence.

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**P- Reviewer:** Cosmi E, Partsinevelos G

**S- Editor:** Kong JX **L- Editor:** A **E- Editor:** Jiao XK





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