Asian Journal of Medicine and Health

10(3): 1-7, 2018; Article no.AJMAH.39244
ISSN: 2456-8414

Pattern and Outcome of Iatrogenic Genitourinary Fistula from Obstetric and Gynaecological Surgeries in a Tertiary Institution, North-Western Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author SN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SN and AME managed the analyses of the study. Authors MH and AAP managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJMAH/2018/39244
Editor(s):
(1) Triveni Krishnan, Division of Virology, National Institute of Cholera and Enteric Diseases, Kolkata, India.
Reviewers:
(1) Yong Du, University of Houston, USA.
(2) Athanase G. Lilungulu, Dodoma University, College of Health Sciences, Tanzania.
Complete Peer review History: http://www.sciencedomain.org/review-history/23321

Original Research Article

Received 26th November 2017
Accepted 14th February 2018
Published 24th February 2018

ABSTRACT

Introduction: Genitourinary fistula is commonly caused by prolonged obstructed labour; however, not all genitourinary fistulas are obstetric in origin. Inadvertent injuries to the urinary tract leading to fistulae do occur during obstetric and gynaecological procedures because of the close anatomical relationship between the urinary tract and the genital tract.
Objectives: This study aims to determine the prevalence, aetiology and outcome of iatrogenic genitourinary fistula repair at the National Obstetric Fistula Centre, Katsina (NOFIC).
Methodology: This was a two-year retrospective review of all patients who had surgery for iatrogenic fistula between 1st January 2015 and 31st December 2016 at NOFIC, Katsina. All patient case notes on this procedure during the stated period were retrieved and analysed.
Results: A total of 728 genitourinary fistula surgeries were carried out in the Centre, out of which 117 (16.1%) were repairs for iatrogenic fistulae, giving a prevalence rate of 16.1%. Only 110 case notes were eligible for analysis, giving a retrieval rate of 94%. The mean age of the patients was

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30.40 ± 8.39 years, and the modal parity was 1. All presented with a history of continuous urine leakage, and 71 (64.5%) had a history of a previous caesarean section. The procedures that lead to the development of the fistula were conducted at secondary healthcare centres in 84 (87.5%) of the patients. The fistulae were a result of emergency caesarean sections in 73.6% of the cases, yankan gishiri in 9.1%, caesarean hysterectomies for ruptured uterus in 6.4%, elective caesarean sections in 4.5% and gynaecologic hysterectomies in 5.4%. A diagnosis of vesicocervicovaginal fistula (VCVF) was made in 62.7% of the cases, vesicouterine fistula (VUF) in 12.7% and ureteric fistula in various combinations in 10%. The abdominal route was used for the repair in 20.9% of the patients. Intraoperative bleeding was the commonest (21%) complication associated with vaginal repair of VCVF. At discharge, 73.6% were successfully closed and continent, while 19.1% had residual fistula.

Conclusion: The prevalence of 16.1% found in this study was high, and the most common cause of iatrogenic fistula was emergency caesarean sections. The majority of the causal procedures were done at secondary healthcare centres; therefore, this study recommends adequate training, mentoring and ongoing supervision of doctors conducting caesarean sections and other gynaecological procedures in secondary health centres as well as increased community education and involvement in preventing harmful traditional practices like yankan gishiri.

Keywords: Iatrogenic; genitourinary; fistula; obstetric; gynaecology.

1. INTRODUCTION

A genitourinary fistula is an abnormal communication between the bladder and/or the urethra and the vagina, which may develop after prolonged obstructed labour, and leads to continuous urinary incontinence. These women, apart from surviving the ordeal of obstructed labour with a genitourinary fistula, face the physical and psychosocial challenges of living with obstetric fistula [1].

Obstetric fistulae occurs in all developing countries but are mostly seen in the “fistula belt,” an area covering the northern half of sub-Saharan Africa from Mauritania to Eritrea, and in the developing countries of the Middle East and Asia [2,3]. The exact prevalence is hard to determine, but it is thought that patterns follow maternal mortality ratios, with higher prevalence seen in regions with high maternal mortality. This is in contrast to developed countries where the causes of fistulae are mainly iatrogenic, secondary to radiation therapy and surgery [2,4]. In 2006, WHO estimated that more than 2 million young women throughout the world live with an untreated fistula, and between 50,000 and 100,000 new women are affected each year [5]. In Nigeria, it is estimated that between 400,000 to 800,000 women are living with obstetric fistulae with about 20,000 cases annually [6].

Iatrogenic fistulae are also commonly seen in developing countries. While providing emergency obstetric care for obstructed labour through caesarean section is essential in preventing the obstructed labour complex, including fistula, poor surgical skill has been shown to lead to iatrogenic fistula [7].

An iatrogenic genitourinary fistula (IF) is an abnormal communication between the bladder or ureter and the uterus/cervix/ vagina, resulting from a surgical procedure. Iatrogenic fistulae are typically caused during caesarean section (CS), ruptured uterus repair, hysterectomy for ruptured uterus, and gynaecological hysterectomy. Raassen considered iatrogenic fistulae to cover spectrums ranging from “definitely iatrogenic” to “likely iatrogenic” [7]. Three groups of fistulae are definitely iatrogenic: all ureteric injuries, whether following CS, CS/hysterectomy, or planned gynaecological hysterectomy; vesico-vaginal vault fistulae appearing after a hysterectomy for gynaecological reasons, such as fibroids; finally, VCVF following delivery of a live baby by CS. A VCVF located between the lower segment of the uterus/cervix and the bladder strongly suggests an accidental bladder injury (suture or cut) during CS. Vault fistulae following emergency hysterectomy for a ruptured uterus or CS/hysterectomy are probably iatrogenic. Vesicouterine/vesicocervicovaginal fistulae following CS for a stillborn baby are likely to be iatrogenic [7].

Iatrogenic causes appear to contribute significantly to the burden of genital fistulae in low-income countries. A review of 5,959 fistula cases from 11 Sub-Saharan African and South Asian countries classified 13.2% as caused by errors during medical procedures [7]. Eighty

percent of these iatrogenic fistula cases occurred after procedures to address obstetric complications—often from a caesarean section, hysterectomy or repair of a ruptured uterus. An overall incidence of 0.33% urinary tract injury has been reported in all pelvic surgeries [8].

Reviews of fistula case records at repair sites supported by Fistula Care Plus in three countries in 2015 showed that 27% of cases in Bangladesh, 8% of cases in the Democratic Republic of Congo (DRC) and 10% of cases in Niger were iatrogenic. Procedures associated with iatrogenic fistula also varied among the countries. Notably, in Bangladesh, 75% of iatrogenic fistula cases resulted from hysterectomy, whereas caesarean section was the more frequent cause in the DRC and Niger [9].

The objectives of this study were to determine the prevalence, aetiology and outcome after repair of iatrogenic genitourinary fistula at the National Obstetric Fistula Centre, Babbar–Ruga, Katsina.

2. METHODOLOGY

This was a two-year retrospective review of all cases that underwent repair for iatrogenic genitourinary fistula at the National Obstetric Fistula Centre, Babbar Ruga, Katsina, Katsina State, North West Nigeria from 1 Jan 2015 to 31 December 2016. NOFIC is the second national fistula centre in Nigeria. The tertiary health centre provides services to the obstetric fistula population in North West Nigeria and neighbouring countries such as the Niger Republic.

Ethical approval was obtained from the ethics and research committee of the institution.

Data was obtained from the patient admission form designed by the Centre, which is filled out for all patients upon admission, intra-operatively, post operatively and at discharge.

The following criteria is used in the Centre to classify a fistula as iatrogenic:

I. Ureteric fistula following obstetric or gynaecological surgery
II. Vesicocervicovaginal fistula/vesico uterine fistula following elective caesarean section
III. Vault fistula following hysterectomy for gynaecological conditions, hysterectomy for postpartum haemorrhage and hysterectomy for ruptured uterus
IV. Vesicouterine fistula following emergency caesarean section
V. Vesicocervicovaginal fistula located within the cervical canal following emergency caesarean section with a live baby
VI. Fistula following assisted vaginal delivery with a live baby for reasons other than obstructed labour
VII. Fistula following yankan gishiri
VIII. Fistula following other gynaecological surgeries like anterior colporrhaphy for cystocoele

All the case notes of patients who had repair for iatrogenic genitourinary fistula during the stated period were retrieved entered and analysed using SPSS version 22 for frequencies and means.

3. RESULTS

A total of 728 genitourinary fistula surgeries were carried out in the Centre during the period of study, out of which 117 (16.1%) were repairs for iatrogenic fistula, giving a prevalence rate of 16.1%. Only 110 case notes were eligible for analysis. The mean age of the patients at presentation was 30.40 ± 8.39 years with a minimum age of 14 years and maximum age of 50 years. The mean age at fistula development was 29.18 ±8.34, with most (39.1%) of the patients within the 30–39 year age group. The modal parity was 1, with 75.4% being multiparous, 17.3% primiparous and 7.3% nulligravida. The majority, 106 (96.4%), had no formal education and 88.2% were Hausa by tribe.

All the patients presented with a history of continuous urine leakage, and 71 (64.5%) had a history of previous CS. Of the procedures that lead to the development of fistulae, 84 (76.4%) were conducted at secondary healthcare centres, 13 (11.8%) at private hospitals, 10 (9.1%) at traditional barbers place and 3 (2.7%) at tertiary hospitals. The fistulae were a result of emergency caesarean sections for prolonged obstructed labour in 73.6% of the cases, yankan gishiri in 9.1%, caesarean hysterectomies for ruptured uterus in 6.4%, elective caesarean sections in 4.5% and gynaecologic hysterectomies in 5.4%.

Table 1. Sociodemographic characteristics

Variable	Frequency	Percentage
Age (yrs)		
10-19	17	15.4
20-29	29	26.4
30-39	43	39.1
40-49	20	18.2
50-59	1	0.9
Parity		
0	8	7.3
1	19	17.3
2-5	27	24.4
>5	56	51.0
Educational status		
Koranic	106	96.4
Primary	2	1.8
Secondary	1	0.9
Tertiary	1	0.9
Ethnicity		
Hausa	97	88.2
Fulani	10	9.1
0thers	3	2.7
Occupation		
None	77	70
Petty trading	23	20.9
Food vendor	5	4.5
Cattle rearing	3	2.7
Begging	2	1.8
Previous caesarean section		
Yes	71	64.5
No	39	3.5

Table 2. Aetiological procedure that lead to the fistula and place of performance

Procedure	Frequency	Percentage
Emergency CS	81	73.6
Yankan gishiri	10	9.1
Caesarean hysterectomy	7	6.4
Elective CS	5	4.5
Abdominal hysterectomy	4	3.6
Vaginal hysterectomy	2	1.8
Forceps delivery	1	0.9
Total	110	100
Place of procedure		
Secondary health centre	84	76.4
Private health centre	13	11.8
Home by traditional barber	10	9.1
Tertiary health centre	3	2.7
Total	110	100

A diagnosis of vesicocervicovaginal fistula (VCVF) was made in 62.7% of the patients, vesicouterine fistula (VUF) in 12.7%, urethrovesicovaginal fistula (UVVF) in 10.9% and left and right ureteric fistula in various combinations in 10%. Using the Kees classification, the majority (79.1%) of the cases were Type I, 10.9% were Type II, 6.3% were Type III and 3.6% were combinations of type I and type III. The major comorbidities found at

presentation were depression in 77.3% (85/110) of the patients, urine dermatitis in 39.1% and foot drop in 33.6%. The majority 70%(77) of patients had no previous attempt at repair in the Centre or elsewhere, and of the 77 cases, 31.8% had early surgical repair, i.e. repair within three months from the time of injury. The abdominal route was used for the repair in 20.9% patients. Intraoperative bleeding was the commonest (21%) complication associated with vaginal repair of VCVF. At discharge, 73.6% were closed and dry, 7.3% were closed with residual incontinence, while 19.1% had residual fistula.

4. DISCUSSION

Genitourinary fistula is a distressing complication of obstetric and gynaecological procedures and leads to serious social and psychological problems [10]. During the study period, a total of 117 (16.1%) surgeries for iatrogenic genitourinary fistula were carried out in the Centre. The prevalence of 16.1% found in this study is lower than the 27% and 54% reported in Lahore and Bangladesh, respectively [8,11]. However, this is higher than the 8% in the DRC, 10% in Niger, 13% reported by Raassen et al. and 13.5% reported by Etim et al. in Calabar [12]. The high prevalence could also be a result of the Centre's role as a referral centre from within and outside Nigeria.

Upon reviewing iatrogenic genitourinary fistula surgeries in the Centre, we found that 84.5% were obstetrical surgical complications and 5.4% were complications of different gynaecological hysterectomies. Among the obstetrical complication cases, 76.3% resulted from complications of emergency cesarean sections, which is higher than the 66% reported in Saudi Arabia [13]. This is, however, contrary to reports citing hysterectomy as the most common cause of iatrogenic fistulae in Karachi and Lahore [14-16].

The mean age of 29.18 ±8.34 reported in this study shows that the majority of patients, 89 (80.9%), were below 40 years of age and at the peak of their reproductive life. Delay in the treatment of these women leads to social and psychological problems in addition to medical issues. Factors that are suspected to place a woman at risk of iatrogenic fistula are prior uterine surgeries, endometriosis, cervical myoma and prior pelvic radiation [16]. In this study, 64.5% of the women had a previous caesarean section, which is lower than the 98% reported by Raassen [7].

Table 3. Fistula type and Kees classification

Type of fistula	Frequency	Percentage
VCVF	69	62.7
VUF	14	12.7
UVVF	12	10.9
VAULT	4	3.6
LUF	4	3.6
RUF	3	2.7
VUF + LUF	3	2.7
VCVF + RUF	1	0.9
Kees classification		
Type I	87	79.1
Type II	12	10.9
Type III	7	6.3
Type I + III	4	3.6

Table 4. Co-morbidities at presentation

Morbidities	Frequency	Percentage
Depression	85	77.3
Urine dermatitis	43	39.1
Foot drop	37	33.6
Amenorrhoea	35	31.8
Anaemia	27	24.5
Hypertension	19	17.3
Type 1 diabetes mellitus	1	0.9

A difference in opinion exists regarding the route of repair. The choice of route depends on the characteristics of the fistula, the surgeon's preference and the surgeon's experience [17].

Most fistula experts agree that almost all vesicovaginal fistula can be repaired via the vaginal route [18,19]. Whatever approach is adopted, the same basic principles for successful repair are adequate exposure, tension free repair, good haemostasis, water-tight closure and adequate postoperative bladder drainage [20]. In this study, the abdominal route was used for the repair in 20.9% of the patients. All the ureteric fistulae except for one were repaired through the abdominal route.

5. CONCLUSION

The prevalence of 16.1% found in this study was high. The most common cause of iatrogenic fistula in the present study was emergency caesarean section. As most of the causal procedures were done at a peripheral hospital,

the need for adequate training, mentoring and ongoing supervision of doctors conducting caesarean sections and other gynaecological procedures is indicated.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was obtained from the ethics and research committee of the institution.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/23321