

## Female surgical sterilization at University of Ilorin Teaching Hospital, Ilorin: 10-year review

### Original Article

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### ABSTRACT

**Background:** Given technological advances over the past few decades, female surgical sterilization has become a safe, convenient, easy, and highly effective birth control method for the long term.

**Objective:** This study aims at determining the uptake, indications, timing, surgical technique and complications of voluntary surgical sterilization in Ilorin.

**Methodology:** A retrospective study involving all clients who have undergone female sterilization by mini-laparotomy at the University of Ilorin Teaching Hospital Family Planning Clinic between January 2002 and December 2011. Clinical data were retrieved from the case notes and the information obtained was analyzed with SPSS version 16 of the computer. All the case notes had adequate information for the study, and none was missing.

**Results:** There were 25,418 deliveries with 205 cases of female surgical sterilizations out of which 95 were through mini-laparotomy, giving an incidence of 8% and 3.7 per 1000 deliveries, respectively. The mean age at sterilization was 38.9 years. Grand-multiparity and completed family size were the main indications. Seventy-nine percent of the clients had interval procedure and Pomeroy's method was used among 70.5% of the clients. Local infiltration was used for most (60%) of the clients. Complication attributable to the procedures occurred in 5.3% of the clients. These include, wound sepsis (2.1%), urinary tract infection (1.05%) and one failed sterilization (1.1%).

**Conclusion:** Concerted efforts at female reproductive health education and counseling will help to dispel some of the rumours and misconceptions associated with the procedure.

**Keywords:** Birth control, grand-multiparity, completed family, mini-laparotomy,

## INTRODUCTION

Female sterilization, which is also called tubal ligation or tubal occlusion, is a surgical procedure, which aims at permanent contraception.<sup>1,2</sup> Female sterilization procedures were first performed in the later 1800s but did not become widely available until the 1930s, when Pomeroy technique for ligating the tubes was introduced. For several decades, most of the procedures were performed for medical indications.

The increasing trend towards smaller families in developed countries coupled with the availability of new technology and simpler, safer, and more effective surgical techniques during the 1970's has led to an increased demand for voluntary sterilization.<sup>2,3</sup>

The United Nations estimates that 180 million couples have relied on surgical contraception to limit their families.<sup>4</sup> An estimated 700,000 female sterilization procedures and 500,000 male sterilization procedures are performed each year.<sup>5</sup> Sterilization is practised to a limited extent in African countries because of aversion to the procedure.<sup>3,6,7,9</sup> In Nigeria, the percentage of contraceptors who rely on female sterilization was found to be 0.3%.<sup>2,8</sup> Among the reasons advanced for this low acceptance rate of sterilization are rumours, misconceptions, and fears of a variety of health risk thought to be associated with the procedure. Other limitations include cultural and religious factors, great desire for a large family size, inadequate facilities, shortage of trained personnel and high infant and childhood mortality.

Sterilization as a method of contraception may be requested for personal or social reasons when a couple has completed their desired family size, especially when other methods are unsuitable. Tubal sterilization is also indicated for women in whom a pregnancy would pose a serious risk to the mother following multiple previous caesarean

sections, repeat abruptions or serious cardiac, renal or hepatic conditions, or for reasons of grand-multiparity.<sup>10,11</sup>

Surgical approaches for female sterilization include laparoscopy, micro-laparoscopy, laparotomy (concurrent with caesarean section), mini-laparotomy, and vaginal procedures. Laparoscopy is the preferred route for interval procedures, whereas a mini-laparotomy is used for post-partum patients. Vaginal colpotomy approaches are used rarely because they are associated with a higher incidence of infection. Local anaesthesia is used for more than 75% of sterilization worldwide.<sup>10</sup>

One third of pregnancy related deaths in the world could be prevented by the use of safe and effective family planning methods. The health benefits of surgical contraception are especially evident in developing countries where temporary methods may be periodically in short supply or used less effectively, and where unwanted pregnancies carry a high risk of maternal deaths.<sup>12</sup>

The aim of this study, therefore, was to determine the uptake of voluntary surgical sterilization, describe the socio-demographic characteristics of acceptors and determine the indications, timing, surgical technique and complications of the procedure.

## MATERIALS AND METHODS

All cases of female sterilizations by mini-laparotomy performed at University of Ilorin Teaching Hospital, Maternity Wing, Ilorin, from January 2002 to December 2011 were reviewed. The case notes of the clients were obtained from the family planning clinic covering 10-year period under review. All the case notes contained adequate information for the study and none was missing. There were 25,418 deliveries with 205 cases of female surgical sterilizations out of which 95 were through mini-laparotomy.

All the sterilization procedures were performed by mini-laparotomy, which is defined as a laparotomy with an incision less than 5cm. The tubal sterilization methods used were Pomeroy's technique (which consisted of excision of a loop from the mid portion of the fallopian tube after tying the portion with catgut suture), modified Pomeroy's technique (which is similar to Pomeroy's technique except for the choice of sutures, placement of more than one suture ties around the tube and burning or cauterization of tubal ends), and Parkland technique (which involves identification of avascular region of mid-portion of the tube, creation of window through meso-salpinx below the tube, placement of rapidly absorbable sutures proximal and distal to the mid-portion of the tube and excision of ligated portion of the tube). Local anaesthesia with 1% lignocaine (10-20ml) was used in 57 [60%] of cases. Local anaesthesia with sedation was used in 32 [33.7%] and general anaesthesia in 6 [6.3%] of cases.

Socio-demographic characteristics of clients such as age, educational status, occupation and parity were obtained. Other factors considered were indications for sterilization and last method of contraceptive used. The timing, surgical methods and type of anaesthesia and complications were also reviewed from the case notes.

The limitation of this study was that being a hospital based study the incidence of tubal sterilization may not reflect the general population deduction.

## RESULTS

During the period, January 2002 to December 2011, two hundred and five (205) clients were sterilized. Of the number, 95 were sterilized through the mini-laparotomy and 110 through conventional laparotomy or caesarean section. The ratio of sterilization procedure to total births was 0.8 per 1000

births. Out of these tubal ligation through laparotomy or caesarean section was 0.43 per 1000 deliveries, while mini-laparotomy accounted for 0.37 per 1000 deliveries.

**Table 1.** Age, parity and educational status distribution of the clients

Age	No.	%
25-29	1	1.0
30-34	19	20.0
35-39	60	63.2
>45	15	15.8
<b>Total</b>	<b>95</b>	<b>100</b>
<b>Parity</b>		
3	7	7.4
4	22	23.2
5	25	26.3
≥ 6	41	43.2
<b>Total</b>	<b>95</b>	<b>100</b>
<b>Educational level</b>		
None	28	29.5
Primary	18	18.9
Secondary	48	50.5
Not stated	1	1.1
<b>Total</b>	<b>95</b>	<b>100</b>

The age of the patients ranged from 27 to 47 years with a mean of 38.9 years. Most of the clients, 60 (63.2%) were aged 35 to 39 years. Only 1 client was less than 30 years of age. Those above 45 years accounted for 15 (15.8%). Their parity prior to sterilization procedure ranged from 3 to 10 with a means of 5.4 births. There were 29 (30.6%) multiparous clients and 66 (69.5%) grand-multiparous clients. Forty eight (50.5%) had secondary education as depicted in Table 1.

Most of the clients, 42 (44.2%), were traders while civil servant, teachers and nurses accounted for 14.7%, 10.5% and 6.5% respectively. Less than one-quarter (23.2%) had not used any method of contraception prior to sterilization while thirty two clients

(33.7%) had used intrauterine contraceptive device before the procedure.

**Table 2.** Indications for sterilization

<b>Indications</b>	<b>No.</b>	<b>%</b>
Desired family size (Completed/Grand-multiparity)	67	70.5
Medical complications	17	17.9
Multiple caesarean section	6	6.3
Economic reason	5	5.3
<b>Total</b>	<b>95</b>	<b>100</b>

Grand-multiparity and completed family size was the commonest indication 67 (70.5%). Seventeen cases were for medical complications which include, hypertension, sickle cell disease, diabetes mellitus and asthma, while 6 (6.3%) of sterilization was among women who had multiple caesarean section (Table 2).

**Table 3.** Timing of sterilization and surgical techniques

<b>Timing</b>	<b>No</b>	<b>%</b>
Interval	75	79
Postpartum	19	20
Post abortal	1	1
<b>Total</b>	<b>95</b>	<b>100</b>
<b>Surgical techniques</b>		
Pomeroy	67	70.5
Modified Pomeroy	26	27.4
Falope ring	-	-
Others	2	2.1
<b>Total</b>	<b>95</b>	<b>100</b>

Table 3 shows the timing of surgery and surgical techniques. Majority (79%) were not pregnancy related (interval), 19 (20%) were postpartum and one (1%) was post-abortal. Pomeroy's technique was employed in 67 patients (70.5%), while the modified Pomeroy's technique was used for 26 clients

(27.4%), and Parkland technique was used for one client, respectively.

**Table 4.** Complications (n= 95)

<b>Complications</b>	<b>No.</b>	<b>%</b>
Wound infection	2	2.1
Urinary tract infection	1	1.1
Laceration of mesosalpinx	1	1.1
Failed sterilization	1	1.1
<b>Total</b>	<b>5</b>	<b>5.4</b>

The post-operative morbidities are shown in Table 4; wound infection was seen in 2 clients (2.1%). There was one failure in a 40-year old para-6 who had an intra-uterine pregnancy four years after tubal ligation done by Pomeroy's method.

There was a decrease in the incidence of voluntary surgical sterilization by mini-laparotomy from 6.7 per 1000 births in 2003 to 1.2 per 1000 births in 2011

**Table 5.** Trends in incidence of voluntary sterilization by mini-laparotomy

<b>Year</b>	<b>No. of Cases</b>	<b>Total Births</b>	<b>Ratio of No. of Cases to total births</b>
2002	19	5,318	0.36
2003	15	2,221	0.67
2004	10	2,039	0.49
2005	12	2,299	0.52
2006	9	2,199	0.41
2007	8	2,482	0.35
2008	8	2,254	0.35
2009	3	1,975	0.15
2010	8	2,049	0.39
2011	3	2,577	0.12
<b>Total</b>	<b>95</b>	<b>25,418</b>	<b>0.37</b>

## DISCUSSION

In this study, the overall incidence of tubal sterilization by all methods was 8 per 1000 births. This is, however, higher than 5.8 per 1000 births reported from Ile-Ife.<sup>7</sup> This may be attributable to the fact that University of Ilorin Teaching Hospital is the only referral hospital in the State that provides both secondary and tertiary health care services unlike Osun State with more than one functioning tertiary institution.

The incidence of tubal sterilization by mini-laparotomy was 3.7 per 1000 births. This was, however, in keeping with the variously reported low acceptance of this method in Nigeria.<sup>7,15</sup> Although this study did not elucidate the reasons for low uptake of mini-laparotomy, previous studies from this centre and others in Nigeria reported reluctance in the use of surgery in female contraception, poor understanding of the overall health benefits and certain misconceptions about the procedure also contributed to this low incidence.<sup>1,13,14</sup> Weight gain, chronic abdominal pain and secondary amenorrhoea were the major health risks wrongly associated with the procedure by most women in addition to the fear of regret in the future.<sup>9,14</sup> The gradual increase in the cost of voluntary sterilization over the years may have also contributed to the decreasing demand for the procedure compared to other modern contraceptive methods.

The age and parity distribution of cases presented are related to the indications for the procedure. Fifty-five women (54.7%) were above 35 years with a mean parity of 5.4 births per woman, showing that majority of them were grand-multiparas and have completed their family size. This is in agreement with similar findings elsewhere in Nigeria.<sup>7, 15</sup>

This study showed that half of the women (50.5%) had secondary or above secondary education. This availed them the opportunity

for better exposure to print and electronic media, and therefore, were able to read and understand information from various sources which had a positive impact on health seeking behavior and uptake of tubal sterilization.

Apart from completed family size and grand-multiparity, economic and health problems were some of the reasons for not wanting to have more children. The health problems include hypertension, diabetes mellitus, sickle cell disease and asthma. Similar findings were reported previously.<sup>12,16</sup>

A considerable proportion of women, 73 (76.8%) in this study had used one form of family planning method before the sterilization procedure, most had used the intrauterine contraceptive device. This is not surprising, as majority of the women had completed their family sizes.

Pomeroy's technique was the method of choice in about 70% of clients, and is the simplest and most commonly performed technique in our centre. This and the modified Pomeroy's method, employed in the majority of cases, have been associated with a 12-month failure rate of 1 in 300-500 patients.<sup>10</sup> Most of the clients had the sterilization done as an interval procedure. This is similar to findings by other workers.<sup>12,15</sup> Long-term complications such as risk of pregnancy and menstrual disturbances are less likely in this period than in the post-partum period.<sup>17</sup>

The use of local anaesthesia and mild sedation has been recommended for sterilization by mini-laparotomy and laparoscopy in order to minimize anaesthetic risks. This type of anaesthesia was cheap, safe, affordable and readily available. Gentle tissue handling, proper use of correct instruments to reduce painful stimuli have

been recommended for successful voluntary surgical sterilization techniques.<sup>18</sup>

Complications attributable to the procedure occurred in 5.4% of clients. The most common complication was wound infection which accounted for 2.1%. This is similar to findings from other studies.<sup>12,15</sup> General anaesthesia was used in 6 (6.3%) of patients that had previous multiple caesarean sections. This was to allow for optimal relaxation of the patients and better access to the pelvic cavity considering the challenges of adhesion. In addition, these patients were handled by the most experienced gynaecologist in the team.

There was one case of failed procedure in this report. The failure was due to spontaneous recanalization following a Pomeroy's procedure, resulting in intrauterine pregnancy. It is important to adequately counsel patients that though bilateral tubal ligation is considered a permanent procedure, pregnancy could occur in a very small percentage after the procedure. This may assist the gynaecologist in the event of any litigation for failure of sterilization.<sup>19</sup>

Regrets after sterilization were not recorded in this report. The reason may be that most of our clients had a stable marriage and a large family size. They were also adequately counseled before the procedure.

Voluntary surgical sterilization by mini-laparotomy under local anaesthesia is a safe procedure and is associated with complications in very few women. Grand-multiparity and completed desired family size were the main indications in the majority of cases. Grand-multiparity contributes significantly to high mortality rate in Nigeria.<sup>20</sup> According to recent data, maternal death could be reduced by one third each year if all women used contraception once they did not want any more children.<sup>21</sup> Therefore, efforts should be directed at free

and qualitative female education up to secondary school level, and promotion of reproductive health education/information and effective counseling for voluntary surgical contraception. Such information should be community oriented, easily understandable and must aim at dispelling some of the rumours and misconceptions associated with the procedure.

Technical and financial support from various organizations such as the United Nation Population Fund Activities, Planned Parenthood Federation of Nigeria and the Association for Voluntary Surgical Contraception will help to reduce the cost of the procedure and encourage more women to accept the procedure.

#### CONCLUSION

The findings in this study showed that the incidence of voluntary surgical contraception is low. Adequate education and counseling will lead to an increase in acceptance of the procedure and consequently, a reduction in high maternal mortality from unwanted pregnancies. Patients who had multiple abdominal surgeries are better handled by the most experienced hands.

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