

Original Article

Role of Laparoscopy in the Management of Infertility Related to Tubo-Pelvic Pathologies in a Low-Resource Country in the Gynecology Department at Chupoint G Bamako / Mali

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Abstract

Objective: The management of tubal infertility and related totubo-pelvic pathologies.

Methodology: Our study was carried out in the Gynecology department at CHU POINT G. It was a cross-sectional study during 09 years. Patients with infertilities due to tubo-pelvic pathology and who needed laparoscopy were included. The statistical tests used were Chi2; P ≤ 0.05 was significant.

Results: During our study, we recorded 14,200 internal consultations, of which 4,779 (33.7%) wanted to have children; 11,169 needed surgery, of which 628 (5.6%) laparoscopic surgery and 354 (3.1%) laparoscopic surgery for infertility.

STIs :52.3% (185/354) of our patients; those with a surgical history: 16.1% (57/354) were risk factors and there was a link between the occurrence of pregnancy after management and surgical history with Khi2: 5.97; P: 0.01. The causes were:tubal obstructions in 69.2% (245/354), hydrosalpinx: 25.4% (90/354) and pelvic adhesions 70.1% (248/354) and there was a relationship between membership and fertility prognosis, adhesiolysis, tubal plasties, laparoscopic fimbrioplasty and the occurrence of pregnancy with respectively Khi2: 10.24 and P: 0.00 and Khi2: 28.95 and P: 0.00. This management enabled us to obtain 207 pregnancies, or 58.5%.

Conclusion: The frequency of tubo-pelvic infertility is very high in our series related to sexually transmitted infection; laparoscopy has an important role to play.

Keywords:infertility, STI, hydrosalpinx, adhesions, laparoscopy, tubal plastic, pregnancy.

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Introduction

Infertility is a global public health problem and affects 8 to 12% of couples. It poses a serious problem in Africa because of the stigma attached to childless couples. Tubal causes are the main etiologies of infertility in Africa. In Africa, 65 to 85% of tubal infertilities are of infectious origin. Their management is complex due to the accessibility difficulty to diagnostic methods and

treatments. The HSG is the most common diagnostic. The management of tubal infertility is mostly based on medical treatment, insufflation and salpingoplasty by laparotomy.¹ Adhesions are abnormal fibrous connections between Tissue surfaces that are usually independent of each other, adhesions appear or are recurrent after a previous adhesiolysis procedure and

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other conventional surgeries.¹ Adherences appear to be more common in women of African origin compared to Caucasians, which may be related to their particular susceptibility to developing fibroids and keloids. A natural immunity challenge has been suggested, but no biological marker is known today. The American Fertility Society (AFS) score takes into account the type of adhesion (velamentous or dense), its extent (proportion of the organ covered) and location (ovary, tube with a score for each appendix).² Intra-peritoneal adhesions, the most frequent complications of abdomino-pelvic surgery, cause serious long-term sequela: Mechanical infertility: 10% to 15% of cases, extra-uterine pregnancy, pelvic pain, dyspareunia, intestinal obstruction, reoperations, difficulties in any new surgery, alternation of life quality, economic consequences, medico-legal consequences.² Tubo-peritoneal pathologies represent 26% of the causes of hypofertility in couples and hydrosalpinxes are found in 10 to 15% of patients undergoing medically assisted procreation (MAP) for tubal infertility.³ They are consequences in 80% of cases of pelvic infections of gynecological or extra-gynecological origin. Several explorations, in particular radiological, have been proposed in order to assess the importance of tubal lesions with the development of different scores.^{4,5} allowing the subsequent prognosis of fertility to be more accurately defined. Infertility of tubo-peritoneal origin is still an issue, its frequency is increasing. Laparoscopy makes it possible both to confirm the tubal damage and to propose an appropriate therapeutic procedure. This new technique has been in full expansion in northern countries for the last twenty years, and is now being transferred to developing countries. In Mali, the technique was introduced in March 2001. Laparoscopy and In Vitro Fertilization (IVF), which are still not widespread, are real challenges: challenge in training gynecologists in the practice of laparoscopy, challenge in making in vitro fertilization available and accessible to all sections of the population and above all the challenge of preventing tubal damage. The aim of our work is to evaluate the results of laparoscopic surgery of tubal pathologies in terms of pregnancies obtained in the gynecology department at CHU POINT G. It is important to see today how much its introduction has modified the conduct adopted in the management of female infertility.

Methodology

Our study was carried out in the Gynecology department at CHU POINT G. All patients who came for external consultation were included; we collected the

observations of patients followed for infertility and operated for adnexal pathologies. Inclusion criteria were as follows: patients with primary or secondary infertility based on the Hysterosalpingography (HSG) result and who required laparoscopy with a normal or minimally altered spousal spermogram, a hormonal assessment of normal patients. Our study did not include all the patients admitted to the external department for infertility and whose couple's file was incomplete or for other reasons.

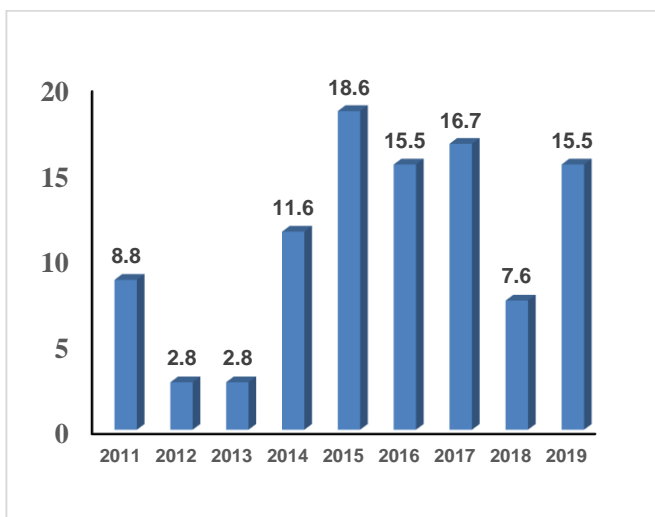
The variables studied were: socio-demographic variables; clinics; paraclinicals; supported; fertility prognosis, result of treatment. We have identified from the hospitalization records the following epidemiological characteristics: age, pregnancy, parity, type and duration of infertility and risk factors for the occurrence of tuboperitoneal infertility. We have supported the results by diagnostic means (ultrasound, hystero-graphy and diagnostic laparoscopy). From the operating reports, we have noted the preoperative findings as well as the therapeutic procedures performed. For the staging of tubal lesions we have adopted the classification of Data and al.³ Preoperatively, the appearance of the tube and its flexibility were assessed according to the Boer-Meisel² and Brossen classifications.⁴ These data were recorded on individual survey forms dedicated. Data collection and analysis were done on SPSS 12.0 software. The statistical test used was Chi2. The test was considered statistically significant for a "p-value less than 0.05. Patients were contacted by telephone to assess the results of laparoscopy in terms of pregnancies achieved with a minimum collection of 12 months and a maximum of 9 years. Before each operation, the consent of each patient was systematically obtained after she had been informed of the operative diagnosis, the endoscopic procedure to be performed, the expected benefit and possibly the possibility of conversion to conventional and preoperative surgery.

Results

During our study period, we recorded 14,200 external consultations, of which 4,779 consultations for child desire were recorded, i.e. a frequency of 33.7%. During our study period there were 11,169 surgical interventions of which 628 laparoscopic surgeries or a frequency of 5.6% and 354 cases of laparoscopic surgery for infertility, or a frequency of 3.1%. (Table I) The largest number of interventions was carried out during 2015, i.e. 18.6%. (Figure 1)

Table I: Frequency of consultations and surgical activity

Reasons	Frequency (number)
Total number of consultations	100% (14,200)
Number of consultations for other causes	66.3% (9,421/14,200)
Number of consultations for desire for a child	33.7% (4,779/14,200)
Number of laparoscopies	2.5% (354/14,200)
Total number of surgical intervention	11,169 (100%)
Total number of other surgical intervention	91.2% (10,187/11,169)
Total number of laparoscopic surgery in general	5.6% (628/11,169)
Total number of laparoscopic surgery for infertility	3.1% (354/11,169)


Figure 1. Distribution of patients by year.

The 18-35 age group was in the majority in our sample with 78.2% (277/354); the educated (schooling) rate was 61.3% (217/354) and there was a link between the educational level of our women and fertility prognosis with Chi2: 6.86, P: 0.03; over 50% (179/354) of our patients were housewives. Civil servants were in the majority among husbands in our study, i.e. 34.2% (121/354); Married women represented 98.6% (349/354) of our sample; the majority of our patients were from urban areas, i.e. 70.3% (249/354); Monogamy was 75.7% (268/354). In our study 75.1% (266/354) of our patients were referred. 52.3% (185/354) of our patients had had a genital infection. 16.1% (57/354) of our patients had a surgical history which was distributed as follows: 10.2% (36/354) of our patients had benefited from tubal plasty, caesarean section: 3.1% (11 / 354); laparoscopic surgery: 2% (7/354); others: 0.8% (3/354) and we found an association between the occurrence of pregnancy after management and surgical history with

Khi2: 5.97; P: 0.01. Primary infertility was in the majority with 72% (255/354) of cases followed by secondary infertility: 28% (99/354). The duration of infertility was greater than or equal to 2 years represented 99.2% (351/354) of our sample and 0.8% (3/354) had a duration of infertility of 1 year. (Table II)

Table II: Socio Demographic characteristics

Age group	Percentage
18-35	78.2
36-50	21.8
Educational level	Percentage
Educated (schooling)	61.3
Not educated	38.7
Profession our patients	Percentage
Housewives	50.6
Civil servants	22.3
Shopkeepers	16.1
Students	7.3
Others small trades	3.7
Profession of husbands	Percentage
Civil servants	34.2
Workers	31.6
Shopkeepers	26.8
Students	2.3
Others	5.1
Marital status	Percentage
Married	98.6
Engaged	1.4
Residence of couples	Percentage
Urban	70.3
Rural	29.7
Matrimonial regim	Percentage
Monogamy	75.7
Polygamy	24.3
Total	100

The MAGE adherence score was average in 39.5 (140/354) of our patients, mild in 2.5% (9/354), severe in 28% (99/354) and there was no adherences in 29.9% (106/354). We found a relationship between MAGE Score and fertility prognosis with Chi2: 64.53 and P: 0.00 (Table III). This fertility prognosis depended on the location of the adherence on the fallopian tubes, the fewer the adherences on the auricles and ovaries the greater chance of pregnancy, so there was a strong relationship between the location of the adherences and the prognosis of fertility with Chi2: 40 and P: 0.00. After the management of these adherences we found a relationship between the MAGE Adherence Score and the occurrence of pregnancy with Khi2: 30.85; P: 0.00. That is to say, the more severe the MAGE Score, the less pregnancy there was: mild stage: 66.6% pregnancy;

Medium MAGE Score: 50% pregnancy and Severe MAGE Score: 46.4% pregnancy (Table IV)

Table III: Relationship between Mage score and fertility prognosis

MAGE Score	FERTILITY PROGNOSIS			Total
	GOOD	BAD	MIXED	
Lack of adherence	93	7	6	106
Light stage	3	3	3	9
Medium stage	121	19	0	140
Severe stage	55	20	24	99
Total	272	49	33	354

Chi²: 64.53 et P : 0,00

Table IV: Relationship between Mage Score and occurrence of pregnancy after their management

MAGE SCORE	POST-COITAL PREGNANCY		Total
	Yes	No	
Lack of adherence	85	21	106
Light stage	6	3	9
Medium stage	70	70	140
Severe stage	46	53	99
Total	207	147	354

The methylene blue test during laparoscopy was negative in 62.4% (221/354) and positive in 37.6% (133)

We Achieved 38.1% or 135/354 of tubal plasties, Adhesiolysis: 32.8% or 116/354, Fimbrioplasty in 5.1% (18/354) and Abstention in 24% or 85/354 and we note a relationship between the procedures performed during laparoscopy and the occurrence of pregnancy with Chi²: 28.95 and P: 0.00. The fertility prognosis was good in 76.8% or 272/354 cases after laparoscopic management, mixed in 9.3% (33/354) and bad in 13.8% or 49/354.

After laparoscopic management, we obtained 207 pregnancies, i.e. 58.5% of our sample. The time to conception after laparoscopic management was between 0 to 1 year in 37.6% or 133/354 and 1 to 2 years: 20.9% or 74/354.

In our series, the 18-35 age group was in the majority in our sample with 78.2% (277/354); the schooling rate was 61.3% (217/354) and there was a link between our women's educational level and fertility prognosis with Chi²: 6.86, P: 0.03. Primary infertility was in the majority with 72% (255/354) of cases followed by secondary infertility: 28% (99/354). The duration of infertility longer or equal to 2 years represented 99.2% (351/354) and 0.8% (3/354) had a duration of infertility at 1 year. The tubes were obstructed in 69.2% (245/354), bearing hydrosalpinx in 25.4% (90/354), penetrable in 2.3%

(8/354) and not made in 3.1% (11/354). Pelvic adhesences were present in 70.1% (248/354) of our patients and absent in 29.9% (106/354) and there was a relationship between the presence of adherence and fertility prognosis with Chi²: 10.24 and P: 0.00 and after the management of these adhesences we also found a relationship between the outcome of adhesiolysis and the occurrence of pregnancy with Chi²: 29.38; P: 0.00. After the management, the MAGE Adherence Score was related to the occurrence of pregnancy with Chi²: 30.85; P: 0.00. The more severe the MAGE Score, the less pregnancy there was: mild stage: 66.6% pregnancy; Medium MAGE Score: 50% pregnancy and Severe MAGE Score: 46.4% pregnancy. We achieved 38.1% or 135/354 of tubal plasties, Adhesiolysis: 32.8% or 116/354, Fimbrioplasty in 5.1% (18/354) and we note a relationship between the procedures performed during the Laparoscopy and the occurrence of pregnancy with Chi²: 28.95 and P: 0.00. We obtained 28.5% (59/207) of intrauterine pregnancies and 4.8% (10/207) of extrauterine pregnancies by tubalplasty; 26% (54/207) of intrauterine pregnancies and 1.9% (4/207) of extrauterine pregnancies by adhesiolysis; 3.8% (8/207) intrauterine pregnancies and 0.4% (1/17) extrauterine pregnancies by fimbrioplasty. Furthermore, we did not note any miscarriage in the surgical procedures. Therapeutic abstention represented 34.2% (71/207) of pregnancies and 0.4% (1/207) of spontaneous miscarriage.

We performed 38.1% or 135/354 tubal plasties; Adhesiolysis: 32.8% or 116/354 and Fimbrioplasty: 5.1% or 18/354 which allowed us to obtain 207/354 spontaneous pregnancies or 58.5%(207/354) and we note a relationship between the options of laparoscopic management and the occurrence of pregnancy with Chi²: 38.46 and P: 0.00. We obtained 28.5% (59/207) of intrauterine pregnancies and 4.8% (10/207) of ectopic pregnancies by tubal plastic surgery; 26% (54/207) of intrauterine pregnancies and 1.9% (4/207) of ectopic pregnancies by adhesiolysis; 3.8% (8/207) intrauterine pregnancies and 0.4% (1/17) ectopic pregnancies by fimbrioplasty. Furthermore, we did not note any miscarriage in the surgical procedures. Abstention from treatment in cases where laparoscopy appeared normal accounted for 34.2% (71/207) of pregnancies. Most of these spontaneous pregnancies: 64.25 (133/207) were obtained after treatment within 0 to 1 year and 35.74% (74/207) within 1 to 2 years.

Discussion

Our frequency is close to the African series⁶⁻⁹ and low compared to the Western series where this activity is common.^{10,11} This practice which is not very widespread in our regions is due to the limited number of endoscopists, the lack of trained operating room staff, the inaccessibility of emergency equipment, the low availability of consumables, the high demand for obstetrical care, and the often advanced clinical pictures presented by our patients.

In our series, the 18-35 age group predominated with 78.2%, they were schooling in 61.3%, housewives in 50.6%, married in 98.6%, living in a monogamous couple in 75.7 % coming from the city in 70.7%. Their husbands were civil servants in 34.2%. Our series is overlapping with other African series.^{8, 9, 12, 13} In our study, the reference was the most frequent mode of admission, at 75.1% (266/354). Genital infections were found in 52.3% (185/354). They had a surgical history in 16.1% (57/354) which were distributed as follows: 10.2% (36/354) of tubal plasty, caesarean section: 3.1% (11/354); laparoscopic surgery: 2% (7/354); others: 0.8% (3/354) and there was an association between the occurrence of pregnancy after management and history of surgery with Chi2: 5.97; P: 0.01. According to Gates et al. and WHO^{15, 16} tubal infertility of infectious origin is distributed as follows in the world: Sub-Saharan Africa: 70%, Latin America: 40%, Asia: 30%, Europe: 20%. According to them, conventional surgical procedures are also a source of adhesions. In our series, primary infertility was in the majority with 72% (255/354) of cases and the duration of infertility of 2 years and more represented 99.2% (351/354) of our patients. According to Mehdi Kehila et al.¹⁷ Primary infertility represented 56.7% of their sample and the duration of infertility at 180 months was 48.9%. In the literature, the risk factors for infertility were age, duration and type of infertility, standard of living, environment, diet, weight, stress, toxic substances (tobacco, alcohol, professional products), professional activity.

Causes: were represented at the HSG by: distal tubal obstructions in 69.2% (245/354), hydrosalpinx: 25.4% (90/354). In the diagnostic approach to female infertility, it constitutes the first examination that should be performed.^{18- 20} According to Cissé et al.²¹ out of 1094 HSG, tubo-peritoneal lesions accounted for 61.7% of anomalies with 25.9% of tubal obstructions and 25.3% of hydrosalpinx. During our laparoscopic explorations, the causes were represented by: pelvic adhesions:

70.1% (248/354). We found a relationship between the presence of adhesion and the prognosis of fertility. Chi2: 10.24 and P: 0.00 and after their care we also found a relationship with the occurrence of pregnancy with Chi2: 29.38; P: 0.00.

According to Jean Dupont et al.²², pelvic adhesions accounted 83.7%, Mboudou et al. found. 71.6%.²³ However, our result is greater than 40.6% of pelvic adhesions reported by Mbaye et al. and 33% of pelvic adhesions reported by Jain et al. in India.^{24, 25} The difference in the prevalence of pelvic adhesions can be explained by the difference in the characteristics of the study population, in the prevalence of infections, and in the frequency of a previous of pelvic surgery between these studies. Several authors have found an association between the degree of adnexal adhesions and the rate of occurrence of lifetime births after adhesiolysis.^{26, 27, 28} According to the literature, the causes of female infertility were: ovulation disorders: 35%; tubal obstruction: 35%; endometriosis: 20% and in 10% of cases the cause remains unexplained.

According to Magatte et al.²⁹ after the management of the 101 patients treated for infertility, medically assisted procreation was indicated in 29 patients, or 28.7%, six became pregnant. For one of them, the pregnancy ended prematurely with a spontaneous abortion, while for another, it turned out to be the recurrence of an ectopic pregnancy requiring salpingectomy. According to a European series: adhesiolysis for tubal infertility represented 19%, which is distributed as follows: 44.7% for the mild stages, 36.8% for the middle stages and 18.4% for the severe stages. After an average follow-up of 19 months, they achieved 16 pregnancies including 2 ectopic pregnancies (GEU). These pregnancies were spontaneous in 68.7% of cases, 25% after artificial insemination with spouse's sperm (IAC) and 6.2% after in vitro fertilization (IVF).³⁰ Another series dealing with distal tubal pathologies in the management of infertility: the frequency of this pathology was 26.5%. They found: phimosis in 64.1% of cases (50.9% of unilateral phimosis and 13.2% of bilateral) and a hydrosalpinx in 28.2% of cases (16.9% of unilateral and 11.3% bilateral). A combination of these two anomalies was found in 7.5% of cases. After an average follow-up of 18 months, they achieved 15 pregnancies, including two ectopic pregnancies (GEU). These pregnancies were spontaneous in 60% of cases, after IAC in 20% of cases and after IVF in 19.9% of cases. Of these 15 pregnancies, 12 were obtained after fimbrioplasty and

only three after neosalpingostomy, including the two GEUs (non-significant difference, $p = 0.2$).³¹

Conclusion

Our study showed that tubo-pelvic pathologies were frequent with sexually transmitted infections as risk factors and can be causes of infertility. Laparoscopy would be an important contribution in the management of infertility related to tubo-pelvic pathologies, hence the need to popularise this technology in low-income countries.

Limitations and difficulties encountered: The limitations encountered during the study were mainly related to the retrospective nature of the study. Indeed, not all the information on the survey form could be collected exhaustively as some information was not specified. This was due to the poor archiving of medical records. Secondly, the long-term follow-up of patients was based on telephone contacts although some of the patients did not have telephone contacts and some contacts were no longer operational which increased the number of patients lost to follow-up.

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