

Full Length Research Paper

Prevalence and pattern of intra-abdominal adhesions seen at diagnostic laparoscopy among infertile women with prior open appendicectomy in Nnewi, south-east Nigeria

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Black women are predisposed to the formation of adhesions, which may be a contributing factor in female infertility. Laparoscopic approach in contrast to open abdominal operations militates against intra-abdominal adhesion formation and may be beneficial to African women where available. To determine the prevalence and pattern of intra-abdominal adhesions in women with prior histories of open appendicectomy being investigated for infertility using laparoscopy and dye test in Nnewi between 1st January 2007 and 31st December, 2008. This was a prospective survey at a private specialist hospital in Nnewi, South-east Nigeria over a two-year period. Data was collected with a pre-designed proforma which included the socio-demographic characteristics and laparoscopic findings in various abdomino-pelvic organs among infertile women that underwent laparoscopy and dye test. A total of 212 patients met the inclusion criteria. The data was analyzed using SPSS package. During the study period, a total of 517 patients had laparoscopy and dye tests, of which 212 (41.0%) patients had prior histories of open appendicectomy. Out of the 212 patients, 86 had adhesions at the previous appendicectomy site. This gave a prevalence rate of 40.6%. The mean age was 35.8± 5.7 years and all the patients were Nigerians (black). Of the 86 patients, 11 (12.8%) had adhesions involving their reproductive organs: right fallopian tube (8/11) and right ovary (3/11). Seventy five (87.2%) patients had adhesions affecting other organs excluding the reproductive organs. Intra-abdominal adhesions were common among infertile women with prior history of open appendicectomy and reproductive organs were affected. There is need to recommend laparoscopy in the treatment of appendicitis in young women in particular to minimize the risks of adhesion and its sequelae. Efforts should be made to make laparoscopy available and affordable in our surgical practice.

Key words: Appendicectomy, adhesions, infertility, women, laparoscopy.

INTRODUCTION

Intra-abdominal adhesions are strands of scar tissue that form in response to abdominal surgery and extend beyond the specific site of incision (Hackethal et al., 2010; Khaitan et al., 2002). This adhesion formation after abdominal surgery is the most common postsurgical complication, and the consequences are a considerable burden for patients, surgeons and the entire health systems (Hackethal et al., 2010).

There are specific features of a surgical procedure that help induce the formation of adhesions. For instance, intentional drying of the tissues such as with gauze during surgery increases adhesion formation (Khaitan et al., 2002). A number of complications could arise following intra-abdominal adhesion. These include intestinal obstruction, inadvertent enterotomy at reoperation, prolonged operative time dividing adhesions, chronic pelvic pain syndrome and infertility (Dijkstra et al., 2000). Adhesions may impair fertility in women by causing blockage of the fallopian tubes (Khaitan and Scholz, 2002). It has been estimated that adhesions

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involving the ovaries or fallopian tubes are responsible for 15-20 percent of female infertility cases (Khaitan et al., 2002).

A variety of factors influence adhesion formation. For instance, the balance between fibrin formation and degradation in the peritoneal cavity during and after surgery seems to be a major factor (Dijkstra et al., 2000). Postsurgical inhibition of fibrinolytic activity severely impairs fibrin breakdown (Dijkstra et al., 2000). It is therefore difficult to define clear guidelines on how to reduce adhesion formation in daily practice. Available evidence shows a racial predisposition to adhesion formation with a higher prevalence in the blacks than in Caucasians (Cotran et al., 1999) although the reason for this predisposition is not clear.

Nevertheless, there is increasing demand for laparoscopic surgeries as open abdominal surgeries are more likely to produce intra-abdominal adhesions and may be a contributing factor in female infertility.

This study aims to determine the prevalence and pattern of adhesions in black Nigerian women with prior histories of open appendectomy being investigated for infertility using laparoscopy and dye test. The abdomino-pelvic organs involved with the adhesion were also determined.

METHODOLOGY

This is a prospective survey at a private specialist hospital in Nnewi, South-east Nigeria over a two-year period. This hospital, which has up to fifty bed capacity, offers varied services including laparoscopic surgery and assisted reproduction.

Data was collected with a pre-designed pro forma. The data obtained included the socio-demographic characteristics, presence of adhesions at appendectomy site and the abdomino-pelvic organs involved among infertile women that underwent laparoscopy and dye test. All the patients gave an informed consent.

Only the data of patients with co-existing histories of open appendectomy were included in the study. Patients with prior histories of pelvic surgery and pelvic inflammatory disease (acute or chronic) were excluded from the study. Patients which male factors were only identified as a cause of their infertility were also excluded. A total of 212 patients met the inclusion criteria. The information extracted was analyzed using SPSS package.

RESULTS

During the study period, a total of 517 patients had laparoscopy and dye tests, of which 212 (41.0%) patients had prior histories of open appendectomy. Out of the

212 patients, 86 had adhesions at the previous appendectomy site. This gave a prevalence rate of 40.6%. The age distribution of the patients is shown in table 1. The age ranged from 21-50 years. The mean age was 35.8± 5.7 years. All the patients were Nigerians (black). Of the 86 patients, 11 (12.8%) had adhesions involving their reproductive organs: right fallopian tube (8/11) and right ovary (3/11). Seventy five (87.2%) patients had adhesions affecting other organs excluding the reproductive organs. These are shown in tables 2 and 3.

DISCUSSION

Open abdominal surgery is more likely to produce intra-abdominal adhesions than surgery performed via laparoscopy. In this study, the prevalence of 40.5% of adhesion in the appendectomy site was noteworthy. However, adhesion formation is not unusual as it is part of the innate peritoneal defence mechanism in peritonitis, which may occur following ruptured appendicitis (Van Goor, 2007).

All the patients in this study were blacks. This may explain why keloid formation was the commonest complication observed. Available evidence shows a racial predisposition to adhesion formation with a higher prevalence in the blacks than in Caucasians (Cotran et al., 1999).

There is increasing risk of fertility concerns in young women undergoing open appendectomy because of the greater tendency of adhesion formation. Adhesion formation is a known cause of tubal factor infertility (RCOG, 2002; Idrisa, 2005). It has been estimated that adhesions involving the ovaries or fallopian tubes are responsible for 15-20 percent of female infertility cases (Khaitan et al., 2002). Adhesions in the abdomen or pelvic area can lead to infertility, pelvic pain, small bowel obstruction and the need for repeat surgery (Dijkstra et al., 2000).

Laparoscopic surgery has been proposed to have diagnostic and therapeutic advantages over conventional surgery. Laparoscopic appendectomy is a useful tool in the treatment of acute appendicitis. It is practicable and has advantages over open appendectomy under certain circumstances such as absence of suppurative appendicitis and peritonitis (Van Goor, 2007). These advantages include minimal invasiveness, better cosmetic outcome, and lower rate of complications based on surgical expertise and state-of-the-art equipment. It can be recommended as an adoptable method for the routine patient with appendicitis (Kavic, 2002; Pirro and Bardah, 2006; Wei et al., 2010). These advantages could be most evident in the young female patient (Kavic, 2002).

Laparoscopic approach for fertile women with presumed appendicitis should be the preferred method of

Table 2. The Age Distribution of the Patients

Age range	Frequency
21-25	4
26-30	35
31-35	65
36-40	64
41-45	33
46-50	11
TOTAL	212

Table 2. Patients That Had Adhesions Affecting Their Reproductive Organs

Reproductive organ	Frequency	Percentage
Right fallopian tube	8	72.7
Right ovary	3	27.3
TOTAL	11	100.0

Table 3. Patients That Had Adhesions Affecting Other Organs *Excluding Their Reproductive Organs

Abdomino-pelvic organ	Frequency	Percentage
Omentum	44	58.7
Caecum	19	25.3
Small bowel	12	16.0
TOTAL	75	100.0

*Four patients had co-existing adhesions affecting both their reproductive and non-reproductive organs.

treatment. With improved visualization of the entire abdomen, laparoscopy for the treatment of appendicitis improves the diagnostic accuracy and can identify the definitive pathology more often than the open approach (Laine et al., 1997; Fogli et al., 2002; Bruwer et al., 2003; Zaninotto et al., 1995). This also applies to laparoscopic evaluation of infertile patients as was seen in this survey.

The right tubes and the right ovaries were among the abdomino-pelvic organs involved with the adhesions. This also raises another fertility concern in these women. With the involvement of omentum, caecum and small bowel in the majority of cases, extra care should be instituted in these patients at repeat open surgeries to avoid injuries to these organs. This may also be of concern while performing laparoscopy. For instance, intra-abdominal adhesions to the ventral abdominal wall are responsible for the majority of trocar injuries especially in the use of veress technique. However, trocar injuries are the major cause of conversion from laparoscopy to laparotomy in majority of cases (Van Goor, 2007).

One of the limitations of this study was our inability to perform the genetic and some endocrinology tests on

these patients with infertility prior to laparoscopy since these factors probably could be contributory.

In conclusion, adhesions were common among infertile women with prior history of open appendectomy. Reproductive organs were often involved. Laparoscopic appendectomy in young women is recommended to minimize the risks of adhesion and its sequelae. Further studies to substantiate the above recommendation are required.

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