WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 8, Issue 5, 223-233. Research Article ISSN 2277– 7105

THE ROLE OF LAPAROSCOPY IN THE PROPAEDEUTICS OF GYNECOLOGICAL DIAGNOSIS

***Ahlam Hammadi Issa and Bushra Mohammed Saeed Jaber**

Ministry of Health, Baghdad, Iraq.

Article Received on
02 Feb. 2019,
Revised on 23 Feb. 2019,
Accepted on 16 March 2019
DOI: 10.20959/wjpr20195-14588

***Corresponding Author**
Ahlam Hammadi Issa
Ministry of Health, Baghdad, Iraq.

ABSTRACT

Laparoscopy is not an alternative to physical examination and classical noninvasive diagnostic methods in acute abdominal pain. However, it is an effective option in patients in whom these methods fail. With increasing experience, treatment may also be performed by laparoscopy in the majority of cases. The use of laparoscopy considerably contributed to diagnostic elucidation, especially in cases of undetermined chronic pelvic pain.

KEYWORDS: Laparoscopy, gynecological diagnosis.

INTRODUCTION

Laparoscopy emerged as a promising surgical technique in the 1970s, as a less invasive method than a laparotomy in propedeutics and treatment of illnesses of the abdominal and pelvic cavities. It brought various benefits, such as better and quicker post-operative recovery, a lesser need for pain relievers, a shorter duration for the surgical procedure and early hospital discharge.[1]

With the evolution of surgical techniques, minimally invasive procedures such as single-port laparoscopy make headway in medical practices and emerge as a challenge to modern medicine. Both patients and healthcare professionals are constantly seeking better functional and esthetic results, with a focus on the quality of life in the post-operative period and in the long term, without compromising the efficiency of the surgical treatment. Single-port laparoscopy consists in performing only one incision for access to the peritoneal cavity, commonly located on the umbilical scar, different from a conventional laparoscopy, in which two to four ports are created.[2]

The use of a single port would allow reducing operative morbidity in relation to conventional laparoscopy, since making each port brings with it the inherent risk of bleeding, injury to adjacent organs, the formation of hernias and compromised esthetic results.[3] The dissemination of the single-port surgical technique, as well as the technological innovations to the surgical materials, has made it the new global trend in relation to the propedeutics and approach to benign gynecological illnesses, especially cases of adnexal tumors.

Diagnosis plays a crucial role in clinical practice. It is the basis for developing an adequate treatment plan and establishing effective patient management strategies. Accurate diagnosis reduces the risk of unnecessary therapies and optimizes the use of resources, particularly when they are limited, bringing benefits throughout the medical assistance process. In the field of Gynecology, a careful diagnosis is especially critical because a great part of the symptoms and diseases that affect women may directly correlate with other specialties. Thus, misdiagnosis can shortly lead to the worsening of a patient's condition, aggravating morbidity and causing higher costs to the healthcare system.[4]

Background

Over the past years, laparoscopy has become a powerful propedeutic as well as a therapeutic tool of modern gynecological practice. It can reduce the number of inappropriate procedures and unnecessary treatments with very low complication rates. In conjunction with other propedeutic procedures, laparoscopy may change the diagnostic conclusion in many gynecological cases with increased efficiency in the diagnosis of conditions undetected during previous clinical and ultrasound examinations.[5]

As laparoscopic procedures and indications have been expanded, there has been a concern for patient safety. Numerous studies[6] demonstrate that as the surgeon's experience increases, the risk of complications decreases and handling of these complications improves. Numerous large series reporting on laparoscopic surgery estimate overall complication rates at 0.34% to 0.57%. Mortality rates are low at 3.3 per 100,000.

As expected, the rate of complications increases directly with the complexity of the procedures. In a meta-analysis by Chapron et al 4 of 3611 women in 27 randomized controlled trials, the authors found a statistically significant decrease in risk of overall complications with laparoscopy.[7] There was no statistically significant difference in the risk of major complications in each group, which was found to be 1.4%.

Intraoperative Complications

ACCESS COMPLICATIONS

Large studies suggest between 1/3 and 1/2 of all major complications occur at the time of surgical entry. A meta-analysis of61 studies on multiple techniques found the overall incidence of major injury at entryisapproximately1.1per1000cases. When open laparoscopy, Veres's needle entry, and direct trocar entry are compared in the literature, there is no consensus on the overriding safety of any 1 technique. Surgeons should be familiar with all 3 techniques and associated risks and use the one most appropriate for the patient.[8]

Open laparoscopy is used widely by general surgeons in the United States, and less commonly by gynecologic laparoscopists. Visualization of the pelvis with the use of an open laparoscopy approach is often suboptimal in patients with intraabdominal adhesions. This approach does not decrease risk to patients with a history of prior surgery, with a risk of bowel injuries with open gynecologic laparoscopy at 0.7 per 1000 cases compared with closed laparoscopy at 0.3 per 1000 cases.[9]

MAJOR VASCULAR INJURY

Vascular injuries are the rarest but most devastating of the major complications of laparoscopy, and they occur with a reported incidence ranging from 0.01% to 0.64%.[10] Mortality in these cases is extreme. Two case series evaluating a total of 48 women who suffered 70 vascular injuries reported 12% and 23% mortality rates independently.9,10 Morbidity differed significantly between these case series, but extremity edema and ischemia, and ureteral, intestinal, and concurrent vascular injuries were reported.[11]

Rates of collateral injury (injuries occurring simultaneously or as a result of repair efforts) were high, at 23% and 51%, respectively.[12] An overwhelming majority of major vascular injuries occur during the entry into the abdomen. The most common devices causing vascular injuries are trocars, followed by Veress needles and electrosurgical instruments. All types of trocars have been implicated in vascular injury, suggesting that technique is a factor in this complication. Rarer incidences of major vessel injury occur during operative laparoscopy, due to risk iermaneuvers such as complex retroperitoneal dissection, lymph node removal, and sacral-colpopexy. Anatomically, the vessels most at risk for gynecologic laparoscopists during primary entry are the aorta, the inferior vena cava, and the iliac vessels, particularly the right side.[13] This makes sense considering most surgeons are right than dead and will be inserting the trocar from the patient's left side. Mesenteric vessels have also been injured.

The inferior epigastric vessels are the most commonly injured vessels, often lacerated at the time of lateral trocar placement. These vessels should be identified laparoscopically and their course observed from the inguinal canal up along the anterior abdominal wall. Pressure on the external abdomen maps a site of trocar insertion lateral to these vessels. It is unclear whether extremes of weight are risk factors for vascular complications. Recognition of vascular injury may be obvious if it occurs during the operation under direct visualization or if there is obvious blood return from a needle or trocar after placement.[14]

Methods

This retrospective chart review study was conducted to evaluate all patients undergoing surgical laparoscopy at the al Karak Hospital. and It involved (200) Women.

Statistical analysis

Descriptive statistical analysis was performed. The absolute and relative frequencies of the study parameters were assessed. Mean, standard deviation, and minimum-maximum values of quantitative variables, as well as the absolute frequency and percentage of qualitative variables, were estimated. Pre- and postoperative diagnoses were compared by the diagnosis agreement test considering the proportions of events.

RESULTS

Patient mean age was 25 years. The majority of women were weight (BMI= 67 ±56) and in reproductive age. The most frequently reported complaint was chronic pelvic pain (55%), followed by dysmenorrhea (44%), desire for definitive contraception (10%), and desire for reproduction (22%). Eleven percent of the women complained of significantly increased menstrual flow, while 14.3% had no clinical complaint and were referred to surgery due to incidental image findings, notably regarding adnexal formations.

Table 1: Distribution of agreement between pre- and postoperative diagnoses.

	N	P value
Infertility	76	0,123
Pelvic pain	54	**0,0000**
Complex ovarian cyst	3	**0,000**
Ovarian tumor	34	0,0012
u/e Adnexal mass	53	0,14
Acute abdomen	35	**0,000**
Tubo-ovarian abcess	45	**0,000**

In general, laparoscopy contributed to diagnosis elucidation of infertility cases, chronic pelvic pain, undetermined origin, complex ovarian cyst cases, ovarian tumor cases.

Diagnostic laparoscopy is being used by general surgeons. With increasing experience, treatment is also possible in the same session. Physical examination findings may be equivocal in patients who are old, obese, under immunosuppressive therapy, or who have diabetic neuropathy or abdominal sepsis.[15] Making a diagnosis under these conditions is difficult, and a delay in the decision to operate may significantly increase morbidity and mortality. The principal advantage of laparoscopy over laparotomy is that it can be performed under local anesthesia, even at the bedside if necessary.[16] Diagnostic laparoscopy establishes the diagnosis in the majority of the cases, the accuracy in patients with acute abdominal pain being reported to range from 86% to 100%.[17]

In 40% to 60% of the patients who undergo laparoscopy for unexplained abdominal pain, the final diagnosis is acute appendicitis.[18] In 30% to 40% of the female patients who undergo open appendectomy for acute appendicitis, the removed organ is histologically normal. Laine and associates performed a randomized study in patients with right lower quadrant abdominal pain and reported negative appendectomy rates of 44% in the open surgery and 4% in the laparoscopy group.[19] Graham and coworkers 8 reported a negative appendectomy rate of 22% in a series of laparoscopic appendectomies. Wagner and associates 14 have reported the sensitivity and specificity of diagnostic laparoscopy in acute appendicitis as 95% and 96%, respectively.[20]

Increased vascularity in the appendiceal serosa, fibrous thickening, omental thickening, band formation, an abscess in the per appendicular region are findings suggestive of appendicitis. However, external inspection of the appendix at laparoscopy may be an unreliable guide to the presence of mucosal appendicitis. Also, despite technological developments, the frequency of complications such as perforation, per appendicular abscess, and inflammatory mass formation is 30% to 40%.[21] Especially in female patients with right lower quadrant abdominal pain, diagnostic laparoscopy may be performed if the preoperative diagnosis is acute appendicitis and laparoscopic appendectomy may be done before the development of complications. Our policy was to remove the appendix during laparoscopy if no other clear cause of right lower quadrant pain was found. The removed organ was histologically normal in one of our patients. In female patients with right lower quadrant or pelvic abdominal pain, the differential diagnosis includes pelvic inflammatory disease (PID), ovarian cyst, ectopic

pregnancy, ovarian torsion, tuboovarian abscess, and acute salpingitis. In one study on pelvic pain, gynecologic causes were diagnosed by laparoscopy in 42%. Anderson and colleagues in a series of 3029 open appendectomies, diagnosed gynecologic problems in 7% of the patients who underwent an unnecessary appendectomy. Pelvic inflammatory disease can be accurately diagnosed by laparoscopy in 80% of the cases.[22]

In our series, we diagnosed PID in nine patients, rupture of an ovarian cyst in six, and ectopic pregnancy in three. In two patients, PID was diagnosed falsely. The accuracy rate of laparoscopy for PID thus was 82%. Patients with PID were treated by a 5-day course of clindamycin/gentamicin. Laparoscopic treatment was performed in all patients with ovarian cyst rupture and ectopic pregnancy. Other disorders that may be diagnosed by laparoscopy are peptic ulcer perforation, ischemic intestinal disease, and intestinal obstruction.[23]

The body, fortunately, localizes peptic ulcer perforation in the majority of the cases, but generalized peritonitis develops in 5%. Furthermore, free air is not observed in the abdominal radiographs in a fourth of the cases.[24] In four patients who had acute abdominal pain in the absence of generalized peritonitis findings, diagnostic laparoscopy revealed peptic ulcer perforation; primary suture by laparoscopy was performed in three. Mesenteric vascular disease was diagnosed with laparoscopically in four patients. One patient had a mesenteric vascular disease that was diagnosed by laparotomy 2 days after laparoscopy because of persistent abdominal pain. The necrotic intestinal segments were resected in three patients in laparotomy. In two patients, nonexclusive vascular disease was diagnosed; laparoscopic second-look surgery was performed 36 hours later, and the intestines were observed to be normal. In order to avoid false-negative procedures, second-look laparoscopy should be performed in patients with suspected mesenteric vascular disease. Intestinal obstruction caused by adhesive bands was diagnosed in three patients.[25] Adhesiolysis was performed by laparoscopy in two patients and by laparotomy in one. The indication for surgery is difficult to establish in intensive care patients who have unexplained equivocal abdominal pain. Unnecessary laparotomy in this patient group increases morbidity and mortality significantly. Diagnostic laparoscopy may be used in this setting. In one study, laparoscopy established the diagnosis in 96% of the intensive care patients in whom acute abdomen was suspected.

The introduction of laparoscopy into clinical practice has opened up new avenues for the diagnosis and management of chronic pelvic pain. It is estimated that more than half of patients with a normal preoperative pelvic examination will present abnormal findings during

the laparoscopic procedure.[26] The literature shows that in women with chronic pelvic pain undergoing laparoscopy, the diagnosis may remain inconclusive in approximately 35% of cases, and endometriosis and adhesions can be diagnosed in 33% and 24%, respectively.[27] These findings represent about 90% of all laparoscopies in women with pelvic pain suggesting that the predominant role of laparoscopy in the evaluation of these patients is to diagnose or rule out endometriosis and adhesions.

Except in cases of endometrioma, ovarian retention syndrome, and ovarian residual syndrome, ovarian cysts are not a common cause of chronic pelvic pain. The laparoscopic assessment of patients with chronic pelvic pain reveals ovarian cysts in only 4% of all cases excluding endometriomas.[11] Endometriosis, in turn, is a common laparoscopic diagnosis in patients with chronic pelvic pain, found in 15% to 80% of women undergoing surgery for chronic pelvic pain.[28]

Similarly, endometriosis is estimated to affect up to 50% of infertile women, and its severity appears to correlate with reduced fertility. Infertility is the classical indication for propedeutic/therapeutic laparoscopy, which is indispensable to elucidate cases with no apparent cause.[29] According to non-controlled retrospective studies, diagnostic laparoscopy performed after several failed ovulation induction treatment cycles reveals significant pelvic pathology amenable to surgical treatment.[30] Laparoscopy indicates intra-abdominal abnormalities in 36%-68% of cases, even after normal hysterosalpingography. Depending on the severity of laparoscopic findings, the initial treatment decision may be replaced by direct laparoscopic intervention, a laparotomic approach to fertility restoration or in vitro fertilization. This implies that, in addition to being a clinically important diagnostic tool, laparoscopy is essential for infertility treatment decision making.[31]

In this study, laparoscopy also proved to aid the diagnosis of tubal-ovarian abscess ($P<0.05$). Despite the small number of cases, these findings corroborate the role of laparoscopy as a specific clinical criterion for the diagnosis of complicated pelvic inflammatory disease.[32] Although no statistical difference was reached, laparoscopy increased in 76.7% the diagnosis of pelvic-abdominal adhesions, demonstrating that preoperative propedeutics is still ineffective to establish the diagnosis of this condition. Adhesions are common etiologic factors for infertility, dyspareunia, intestinal obstruction and chronic pelvic pain albeit their role in the physiopathology of pain remains unclear. Laparoscopy in 1,061 patients revealed

that pelvic adhesions (found in 32.5% of cases) are the most common cause of chronic pain.[33]

The use of laparoscopy can reveal treatable conditions, not detected using other methods, with a very low rate of complications. In our study, the rate of potentially severe complications ranged from 0.3% to 0.6%. A survey of 6.451 laparoscopic procedures showed an overall complication rate of 0.65% (42/6451). However, this rate rose to 0.80% (39/4865) when surgical laparoscopy was compared to merely diagnostic laparoscopy that was associated with a complication rate of 0.19% (3/1586) ($P<0.001$).[34]

The benefits of this minimally invasive technique indicate that an in-depth discussion on reshaping medical residency programs is necessary to adjust them to the new technology available as well as to today's reality. Given its propedeutic nature and association with very low complications risks, diagnostic laparoscopy should be routinely addressed in the training of future gynecologists. All efforts should be made so that health policies contemplate the dissemination and increasing use of laparoscopy, which has been demonstrated to offer numerous advantages throughout the medical assistance system, especially in the field of gynecology.[35]

REFERENCES

1. Laine S, Rantala A, Gullichsen R, Ovaska J. Laparoscopic appendectomy— is it worthwhile? A prospective, randomized study in young women. Surg Endosc., 1997; 11: 95–97.
2. Howard FM. The role of laparoscopy as a diagnostic tool in chronic pelvic pain. Baillieres Best Pract Res Clin Obstet Gynaecol, 2000; 14(3): 467-94.
3. Lamvu G, Tu F, As-Sanie S, Zolnoun D, Steege JF. The role of laparoscopy in the diagnosis and treatment of conditions associated with chronic pelvic pain. Obstet Gynecol Clin North Am., 2004; 31(3): 619-30.
4. Mereu L, Ruffo G, Landi S, Barbieri F, Zaccoletti R, Fiaccavento A, Stepniewska A, Pontrelli G, Minelli L. Laparoscopic treatment of deep endometriosis with segmental colorectal resection: short-term morbidity. J Minim Invasive Gynecol, 2007; 14(4): 463-9.
5. Liu M, Li L, He Y, Peng D, Wang X, Chen W, Fu X, Ma Y. Comparison of laparoscopy and laparotomy in the surgical management of early-stage ovarian cancer. Int J Gynecol Cancer, 2014; 24(2): 352-7.

6. Terai Y, Tanaka T, Sasaki H, Kawaguchi H, Fujiwara S, Yoo S, Tanaka Y, Tsunetoh S, Kanemura M, Ohmichi M. Total laparoscopic modified radical hysterectomy with lymphadenectomy for endometrial cancer compared with laparotomy. J Obstet Gynaecol Res., 2014; 40(2): 570-5.
7. Newham AP, van der Spuy ZM, Nugent F. Laparoscopic findings in women with chronic pelvic pain. S Afr Med J., 1996; 86(9 Suppl): 1200-3.
8. Janssen EB, Rijkers AC, Hoppenbrouwers K, Meuleman C, D'Hooghe TM. Prevalence of endometriosis diagnosed by laparoscopy in adolescents with dysmenorrhea or chronic pelvic pain: a systematic review. Hum Reprod Update, 2013; 19(5): 570-82.
9. Shore EM, Grantcharov TP, Husslein H, Shirreff L, Dedy NJ, McDermott CD, Lefebvre GG. Validating a standardized laparoscopy curriculum for gynecology residents: a randomized controlled trial. Am J Obstet Gynecol, 2016; 215(2): 204.
10. Nagendran M, Gurusamy KS, Aggarwal R, Loizidou M, Davidson BR. Virtual reality training for surgical trainees in laparoscopic surgery. Cochrane Database Syst Rev., 2013; (8).
11. Dehabadi M, Fernando B, Berlingieri P. The use of simulation in the acquisition of laparoscopic suturing skills. Int J Surg., 2014; 12(4): 258-68.
12. hetty S, Zevin B, Grantcharov TP, Roberts KE, Duffy AJ. Perceptions, training experiences, and preferences of surgical residents toward laparoscopic simulation training: a resident survey. J Surg Educ., 2014; 71(5): 727-33.
13. Kirby TO, Numnum TM, Kilgore LC, Straughn JM. A prospective evaluation of a simulator-based laparoscopic training program for gynecology residents. J Am Coll Surg., 2008; 206(2): 343-8.
14. Fernandes CF, Ruano JM, Kati LM, Noguti AS, Girao MJ, Sartori MG. Assessment of laparoscopic skills of Gynecology and Obstetrics residents after a training program. Einstein (Sao Paulo)., 2016; 14(4): 468-72.
15. hore EM, Lefebvre GG, Grantcharov TP. Gynecology resident laparoscopy training: present and future. Am J Obstet Gynecol, 2015; 212(3): 298-301.
16. hhetri S. Laparoscopy as a diagnostic tool in the evaluation of chronic pelvic pain in women. World J Laparosc Surg., 2009; 2(2): 30-2.
17. ox L, Ayers S, Nala K, Penny J. Chronic pelvic pain and quality of life after laparoscopy. Eur J Obstet Gynecol Reprod Biol., 2007; 132(2): 214-9.
18. Howard FM. The role of laparoscopy in chronic pelvic pain: promise and pitfalls. Obstet Gynecol Surv., 1993; 48(6): 357-87.

19. ranney R, Condous G, Reid S. An update on the diagnosis, surgical management, and fertility outcomes for women with endometrioma. Acta Obstet Gynecol Scand., 2017; 96(6): 633-43.
20. Bosteels J, Van Herendael B, Weyers S, D'Hooghe T. The position of diagnostic laparoscopy in current fertility practice. Hum Reprod Update, 2007; 13(5): 477-85.
21. Kreisel K, Torrone E, Bernstein K, Hong J, Gorwitz R. Prevalence of Pelvic inflammatory disease in sexually experienced women of reproductive age - United States, 2013-2014. MMWR Morb Mortal Wkly Rep., 2017; 66(3): 80-3.
22. Karnath BM, Breitkopf DM. Acute and chronic pelvic pain in women. Hospital Physician, 2007: 41-8.
23. Drozgyik I, Vizer M, Szabo I. Significance of laparoscopy in the management of chronic pelvic pain. Eur J Obstet Gynecol Reprod Biol., 2007; 133(2): 223-6.
24. Wang PH, Lee WL, Yuan CC, Chao HT, Liu WM, Yu KJ, Tsai WY, Wang KC. Major complications of operative and diagnostic laparoscopy for gynecologic disease. J Am Assoc Gynecol Laparosc, 2001; 8(1): 68-73.
25. Eschenbach DA, Wölner-Hanssen P, Hawes SE, Pavletic A, Paavonen J, Holmes KK. Acute pelvic inflammatory disease associations of clinical and laboratory findings with laparoscopic findings. Obstet Gynecol, 1997; 89: 184– 192.
26. Brandt CP, Priebe PP, Eckhauser ML. Diagnostic laparoscopy in the intensive care patient. Surg Endosc, 1993; 7: 168–172.
27. Wagner M, Aronsky D, Tschudi J, Metzger A, Klaiber C. Laparoscopic stapler appendectomy: A prospective study of 267 consecutive cases. Surg Endosc, 1996; 10: 895–899.
28. Anderson RE, Hugander A, Thulin AJG. Diagnostic accuracy and perforation rate in appendicitis: Association with age and sex of the patient and with appendectomy rate. Eur J Surg, 1992; 158: 37–41.
29. Taylor EW, Kennedy CA, Dunham RH, Bloch JH. Diagnostic laparoscopy in women with acute abdominal pain. Surg Laparosc Endosc, 1995; 5: 125–128.
30. Salky BA, Edye MB. The role of laparoscopy in the diagnosis and treatment of abdominal pain syndromes. Surg Endosc, 1998; 12: 911–914.
31. Vander Velpen GC, Shimi SM, Cuschieri A. Diagnostic yield and management benefit of laparoscopy: A prospective audit. Gut, 1994; 35: 1617–1621.
32. Reiertsen O, Rosseland AR, Hoivik B, Solheim K. Laparoscopy in patients admitted for acute abdominal pain. Acta Chir Scand, 1985; 151: 521–524.

33. Cuesta MA, Borgstein PJ, Meijer S. Laparoscopy in the diagnosis and treatment of acute abdominal conditions. Eur J Surg, 1993; 159: 455–456.
34. Schrenk P, Woisetschlager R, Wayand WU, Rieger R, Sulzbacher H. Diagnostic laparoscopy: A survey of 92 patients. Am J Surg, 1994; 168: 348–351.
35. Navez B, d'Udekem Y, Cambier E, Richir C, de Pierpont B, Guiot P. Laparoscopy for management of nontraumatic acute abdomen. World J Surg, 1995; 19: 382–387.