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Outcome Evaluation of Laparoscopic Drainage of Pelvi-Abdominal Abscess at Zagazig University Hospitals

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ABSTRACT

Background: Intra-abdominal abscesses remain a major cause of morbidity and mortality. Intra-abdominal abscesses that are localized usually arise in connection to the damaged viscus. For timely treatment, a correct diagnosis and abscess localization are required. Laparoscopic draining of a large intra-abdominal abscess is a minimally invasive procedure that allows exploration of the abdominal cavity without a large incision.

Aim: This study aimed to to evaluate the outcome of laparoscopic management of abdominal abscesses not amenable to percutaneous or transrectal CT guided or ultrasound US-guided drainage.

Patients and Methods: This prospective study included 24 patients presenting with clinical and radiological manifestations of lower abdominal intraperitoneal abscesses at General Surgery Department, Zagazig University, Egypt. This study was conducted through the period from Feb 2021 to Aug 2021.

Results: Our analysis showed that mean operative time was 97.2 ± 12.3 min, mean intraoperative blood loss volume was 176.5 ± 62.7 ml and 19 cases needed blood transfusion. The VAS score of preoperative pain decreased from 6.9 pre-operative to 5 immediate post-operative and 0.3 at 24 hr post-operative.

Conclusion: For pelvic-abdominal abscesses, laparoscopic drainage proved a realistic, safe, and effective treatment option. Laparoscopic drainage is a minimally invasive treatment with few postoperative complications.

Keywords: Laparoscopic, Intra-abdominal abscesses, Drainage, Pelvi-abdominal abscess.

INTRODUCTION

In today's surgical practice, intra-abdominal abscesses remain a major cause of morbidity and mortality. The enigmatic nature of the underlying disorders, as well as the disease's varied clinical course, can cause delays in diagnosis and treatment, which can have negative consequences for the patient's outcome, length of stay in the hospital, and healthcare expenses **(1).**

Localized intra-abdominal abscesses commonly arise in relation to the injured viscus, such as an appendicular abscess in the right iliac fossa in the case of a perforated appendix or a tubo-ovarian abscess in the pelvis in the case of female adnexa. The omentum, neighboring viscera, and inflammatory adhesions move to the infection site and produce phlegmon, which acts as a barrier to the infection spreading to other peritoneal regions. (2).For timely treatment, a correct diagnosis and abscess localization are required. Most intra-abdominal abscesses are now treated using percutaneous computed tomography (CT) guided catheter drainage (3). A surgical drainage is an option in circumstances where percutaneous drainage is not accessible or practicable due to the presence of numerous abscesses. The surgery can be performed laparoscopically or openly (4).

Laparoscopic drainage of a large intra-abdominal abscess is less invasive, allowing exploration of the abdominal cavity without a large incision and aspiration of purulent exudates under direct vision. If the general condition is good, laparoscopy can also be used to remove the source of sepsis, such as a perforated appendix or a ruptured colonic diverticulum (5). In this study, we tended to evaluate the outcome of laparoscopic management of abdominal abscesses not amenable to percutaneous or transrectal CT guided or ultrasound US-guided drainage.

PATIENTS AND METHODS

This prospective study included 24 patients presented with clinical and radiological manifestations of lower abdominal intraperitoneal abscesses. At General Surgery Department, Zagazig University, Egypt through the period from Feb 2021 to Aug 2021.

Ethical approval:

This study was approved by the Faculty of Medicine, Zagazig University Ethical Committee. Every patient signed an informed written consent. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Pre-Operative preparation:

Preoperative resuscitation included intravenous fluid correction of acid-base and electrolyte imbalances, hemodynamic parameter optimization, nutritional status, and coagulation profile adjustment for all patients. Diabetic patients received intensive insulin therapy using regular insulin to adjust random blood glucose to a range of 100–110 mg/dl. Thromboprophylaxis was performed whenever indicated.

Surgical Technique:

All of the procedures were carried out under general anesthesia. Intravenous antibiotic therapy in the form of a third-generation cephalosporin and

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metronidazole infusion was given to the patients before surgery. The optical port was usually put in the supraumbilical location using an open method. Under the vision, two to four working ports were introduced according to the status of the abscess, respecting the principle of triangulation and keeping the ergonomics of working hands. Insufflation was maintained at 14 mmHg.

The laparoscopic procedure began with a comprehensive examination of the abdominal cavity and the removal of adhesions. Gentle traction, hydro dissection, and a combination of blunt dissection and cold scissors with electrocoagulation of bleeding sites were used to sweep away the omentum and small and large bowel, which normally form an inflammatory barrier surrounding the abscess chamber. In the presence of difficult adhesions, a harmonic scalpel was employed in some cases. The abscess cavity was penetrated, pus samples were taken and sent for bacteriological testing, culture, and sensitivity tests, and the abscess was subsequently drained. If several loculi were discovered, septa were chopped down if possible to form a single drained locus. Normal saline was used to irrigate the abscess cavity. If possible, the cause of infection was treated before drains were installed.

Patients with a hemoglobin concentration less than 7 g% or with an intraoperative blood loss of more than 500 ml received packed red blood cells. The 10-point pain VAS score was used to assess postoperative pain at admission to the postanesthetic care unit and then every six hours for the next 24 hours. When the pain VAS score was more than or equal to four, postoperative analgesia was given in the form of injectable meperidine 50 mg.

Statistical analysis

Data were collected and coded in Microsoft excel form and analysis was done by SPSS version 22. Results were demonstrated in form of mean± SD for normally distributed continuous data and number and percentage for categorical data. Student "t" test was used to analyze normally distributed variables among 2 independent groups, The accepted level of significance in this work was stated at 0.05 (P <0.05 was considered significant).

RESULTS

Tables (1, 2 and 3) showed demographic and laboratory data of the studied cases and causes of intra-abdominal abscess respectively.

Our analysis showed that mean operative time was 97.2 ± 12.3 min, mean intraoperative blood loss volume was 176.5 ± 62.7 ml and 19 cases needed blood transfusion table (4).

Table (5) showed that the VAS score of preoperative pain decreased from 6.9 pre-operative to 5 immediate post-operative and 0.3 at 24 hr post-operative. Also, the mean duration of abdominal drainage was 8.9 ± 2.7 days and the duration of hospital stay was 5.7 ± 1.7 days.

Table (1): Demographic data of the studied cases

		Mean ± SD
Age (years)		41.5 ± 5.2
BMI (KG/m^2)		30.1 ± 2.5
		N (%)
Sex	**Female**	16 (66.7%)
	Male	8 (33.3%)
Diabetic		4 (16.7%)
HTN		4 (16.7%)
Cardiac disease		1 (4.2%)

Table (2): Clinical data of the studied cases

	Mean ± SD
Hb (gm/dl)	10.1 ± 1.2
TLC (x10^3/ul)	21.9 ± 5.2
CRP (mg/l)	41.1 ± 7.6

Table (3): Radiological diagnosis of the studied cases

		N (%)
Primary	**Appendicular abscess**	8 (33.3%)
	Tubo-ovarian abscess	8 (33.3%)
PO	**Appendectomy**	6 (25%)
	Post-cholecystectomy	2 (8.3%)

Table (4): Patients operative data

	Mean ± SD
Operative time (min)	97.2 ± 12.3
Intraoperative blood loss Amount (ml)	176.5 ± 62.7
Needed blood transfusion	19 (79.2%)

Table (5): Patients Postoperative data

		Mean ± SD
Pain VAS score	**Preoperative**	6.9 ± 1
	Immediate PO	5 ± 0.3
	6-h PO	3.1 ± 0.8
	12-h PO	2.5 ± 1.5
	18-h PO	0.4 ± 1
	24-h PO	0.3 ± 0.8
Time till first oral intake (h)		21.4 ± 7.3
Duration of abdominal drainage (days)		8.9 ± 2.7
Duration of hospital stay (days)		5.7 ± 1.7

DISCUSSION

Our radiological diagnosis defined 16 primary intra-abdominal abscesses. Appendicular abscess was 8 (33.3%) and tubo-ovarian abscess was 8 (33.3%). And eight post-operative; Appendectomy was 6 (25%) and Post-cholecystectomy was 2 (8.3%). This agrees with **Baiuomy *et al.*** [(2)] who aimed to evaluate the outcome of laparoscopic drainage (LD) of pelvic and paracolic abscesses. Radiological diagnosis defined 20 primary intra-abdominal abscesses and eight postoperative (PO)

abscesses. Our study reported that the rate of conversation was 16.6%. This is hand by hand with the study of **Baiuomy *et al.*** [2] who reported a conversion rate of 13%. And another studies done by **Taylor** [6] and **Thomson *et al.*** [7] found that the rate of conversation was 5.5% and 5% respectively. But **Kassem *et al.*** [8] reported the conversion rate was 2.4% of cases.

Our analysis showed that the mean operative time was 97.2 ± 12.3 min. This is in agreement with the study of **Baiuomy *et al.*** [2] where the mean operation time was 94.3 ± 12.1 min and ranged from 75 to 120 min. This disagrees with **Clark and Johnson**[9] where they found that the mean operative time of LD was 77 min and ranged from 30 to 196 min.

Our findings revealed that LD offered the examined patients with the usual benefits of laparoscopic surgery, including low postoperative pain scores and analgesic requirements, early postoperative ambulation, and oral intake, as well as a prompt return home. **Ahuja**[10] laparoscopy was found to be superior in terms of surgical site infection, regaining oral intake, length of hospital stay, and cosmesis. On the other side, there have been reports of a somewhat greater incidence of intra-abdominal infection, higher expenses, and longer operative times, although, with more skill, laparoscopic surgery may become faster than open surgery.

In the present study, regarding laparoscopic management time taken to start oral intake (hrs) was > 18-24 were 4 (20%) and >24 was 16 (80%) with a mean of 21.4 ± 7.3 (hrs). This is in agreement with **Wang *et al.*** [11] and **Kassem *et al.*** [8]. They found that oral intake started 20 hours postoperative. This could be explained by the benefits of the laparoscopic approach, which are less stressful to the abdominal wall and peritoneal cavity, having a lower risk of introducing foreign bodies, giving better hemostasis, and result in a faster recovery of bowel motility. We found that the mean intraoperative blood loss volume was 176.5 ± 62.7 ml and patients lost < 200 ml were 2 (10%) and >200 were 18 (90%). There were 16 cases needed postoperative fresh blood transfusion to correct postoperative anemia. Mean VAS score for pain immediate post-operative was 5 ± 0.3 and the 24-h postoperative score was 0.3 ± 0.8. This agrees with the study of **Baiuomy *et al.*** [2], who reported that the mean intraoperative blood loss was 172.5 ± 65.7 ml (range: 100–300 ml). No patient required blood transfusion for intraoperative blood loss, but five patients received a transfusion of freshly donated blood for correction of anemia and to improve their immunity. The mean VAS score immediate postoperative was 4.8 ± 0.7 and the 24-h postoperative score was 0.4 ± 0.6. And only 15 (41.7%) of their patients requested postoperative rescue analgesia.

The removal of the abdominal drain in 3-6 days was in 1 (4.2%), in 7-10 was in 12 (50%) more than 10 days was in 6 (25%). This is in agreement with **Baiuomy *et al.*** [2] where they reported that removal of the abdominal drain in 3-6 days was in 3 (8.3%), in 7-10 was in 22 (61.1%) more than 10 days was in 11 (31.6%).

Regarding Laparoscopic management, the present study showed that mean hospital stay (days) was 5.7±1.7 (days). This agrees with **Bayomi *et al.*** [12] who found that the mean of hospital stay (days) was 5.7 (days) of the percutaneous drainage group. **Clark and Johnson** [9] found in their study that the mean hospital stay was 6.5 days and ranged from 3 to 13 days. In line with these data, **Gosemann et al.**[13] found that laparoscopic compared with open surgery was associated with a shorter length of hospital stay.

CONCLUSION

For pelvi-abdominal abscesses, laparoscopic drainage proved a realistic, safe, and effective treatment option. Laparoscopic drainage is a minimally invasive treatment with few postoperative complications.

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REFERENCES

1. **Eberhardt J, Kiran R, Lavery I (2009):** The impact of anastomotic leak and intra-abdominal abscess on cancer-related outcomes after resection for colorectal cancer: a case control study. Dis Colon Rectum, 52 (3): 380-386.
2. **Baiuomy M, Elgohary H, Oraby E (2017):** Laparoscopic drainage of pelvic abscess: evaluation of outcome. Egypt J Surg., 36 (1): 43.
3. **Hidaka E, Nakahara K, Maeda C, Takehara Y, Ishida F, Kudo S (2015):** Laparoscopic surgery for sigmoidocutaneous fistula due to diverticulitis: A case report. Asian J Endosc Surg., 8 (3): 340-342.
4. **Sartelli M, Chichom-Mefire A, Labricciosa F *et al.*(2017):** The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. World J Emerg Surg., 12 (1): 1-34.
5. **Kimura T, Shibata M, Ohhara M (2005):** Effective laparoscopic drainage for intra-abdominal abscess not amenable to percutaneous approach: report of two cases. Dis Colon Rectum, 48 (2):397-399.
6. **Taylor G (2014):** Abdominal ultrasound is specific but insufficiently sensitive in diagnosing appendicitis. J Pediatr., 164 (3): 672.
7. **Thomson J, Kruger D, Jann-Kruger C *et al.*(2015):** Laparoscopic versus open surgery for complicated appendicitis: a randomized controlled trial to prove safety. Surg Endosc., 29 (7): 2027-2032.
8. **Kassem R, Shreef K, Khalifa M (2017):** Effects and clinical outcomes of laparoscopic appendectomy in young children with complicated appendicitis: a case series. Egypt J Surg., 36 (2):152.
9. **Clark J, Johnson S (2011):** Laparoscopic drainage of intraabdominal abscess after appendectomy: An alternative to laparotomy in cases not amenable to percutaneous drainage. J Pediatr Surg., 46(7):1385-1389.
10. **Ahuja N, Rothstein D (2019):** Surgical Techniques in Pediatric Appendectomy. Controv Pediatr Append., 103-110.
11. **Wang X, Zhang W, Yang X, Shao J, Zhou X, Yuan J(2009):** Complicated appendicitis in children: is laparoscopic appendectomy appropriate? A comparative study with the open appendectomy--our experience. J Pediatr Surg., 44 (10): 1924-1927.
12. **Bayomi M, Alkilany M, Israel J (2020):** Percutaneous Versus Open Surgical Drainage of Intra-Abdominal Abscesses. Zagazig Univ Med J., 26 (4): 649-653.
13. **Gosemann J, Lange A, Zeidler J *et al.*(2016):** Appendectomy in the pediatric population-a German nationwide cohort analysis. *Langenbeck's Arch Surg.*, 401 (5): 651-659.