|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2019: 79.34
Original Research Article
Volume 4, Issue 12; December: 2020; Page No. 217-219

IS UMBILICAL TUBE TECHNIQUE THE BEST METHOD TO GAIN INTRAPERITONEAL ACCESS? A PROSPECTIVE ANALYSIS OF 1532 CASES

Dr Apoorv Shrivastava[1]
Associate Professor, Dept. of Surgery, Index Medical College and Hospital Indore, M.P. (India)

Article Info: Received 06 November 2020; Accepted 22 December 2020
DOI: https://doi.org/10.32553/ijmbs.v5i2.1765
Corresponding author: Dr Apoorv Shrivastava
Conflict of interest: No conflict of interest.

Abstract

Background: Intraperitoneal access in laparoscopic surgery is the first and most important step to start a procedure. Many methods have been described in literature for the same. We share our experience of umbilical tube technique using a vertical infra umbilical or supra umbilical incision for the better cosmetic result.

Methods: This study is a retrospective study of laparoscopy performed for various indications. Umbilical tube technique was performed. In 1532 cases performed from July2016to January 2019. A vertical incision was used instead of a commonly performed curve incision to access the umbilical tube. A vertical incision is again taken after exposing the junction of rectus sheath and umbilical tube. Vertical incision is again taken over the tube to gain access to peritoneal cavity. The closure is done in a similar way with skin closed in subcuticular fashion. No Institutional Review Board (IRB) approval was required for this paper.

Result: The technique is found to be safe, can be performed with technical ease as anatomy is well defined, good cosmesis is achieved. The longest follow up is for a period of one year. No incidence of port site hernia or infection was seen.

Conclusion: The umbilical tube technique using a vertical incision is found to be safe and effective, can be reproduced with technical ease. In our opinion this method can be considered as a standard approach to intraperitoneal access.

Keywords: umbilical tube, intraperitoneal access, port site infection, port site hernia. Laparoscopy.

Introduction

Intraperitoneal (IP) access is the first and important step in any laparoscopic surgical procedure[1]. There are many challenges to the open access including umbilical infection which may be upto 9 percent in some studies Various methods have been described for the IP access including entry through the rectus sheath, umbilicus, and the optical technique which is considered to be the safest[2]. The only concern about the optical access is the cost involved in getting an optical port which is a single use port. Looking at all the above factors we have devised a technique of access via the umbilical tube and which is easily reproducible and have lesser chances of bad scar, umbilical hernia, and infection[3].

This new technique emphasizes the identification and the incision of the point where the midline abdominal fascia is fused with the base of the umbilicus. The importance of the application of counter traction directly at the point of insertion has been described in literature [4]. This method allows the penetration under the direct vision with minimal controlled axial force and without the requirement of fascial sutures or other cumbersome aspects of the traditional open technique[5].

Materials and Methods

This is a Prospective study. The laparoscopy cases performed between May 2017 to June 2019 were included in the study. Various laparoscopic procedures were performed including 772 laparoscopic cholecystectomies, 340 laparoscopic appendectomies, 68 laparoscopic Nissens fund oplications and 120 laparoscopic Hernia and 200 Total Laparoscopic Hysterectomies with 32 other laparoscopic procedures. Out of 1532 cases 611 were males and 921 were females. The age of the patients ranges from 28 years to 68 years.

All those patients with optical techniques were excluded from the studies. The umbilicus was cleaned with undiluted Hydrogen Peroxide before the surgery. Two types of vertical 10mm incision taken supraumbilically and infraumbilically in midline. The supra umbilical incision was taken for TLH and Laparoscopic Appendectomy whereas the infra umbilical incision was taken for Laparoscopic Fundoplication and Laparoscopic Cholecystectomy. The vertical incision was split laterally using the artery forceps, clearing the subcutaneous fat and exposing the umbilical tube.

Exposure of the umbilical tube rectus sheath junction was done. upward traction was constantly used using an Allis forceps at the umbilicus. A vertical incision of 7mm was taken at the umbilical tube upto the junction. The peritoneum was split opened using the artery forceps. The upward traction prevents vascular and bowel injury.

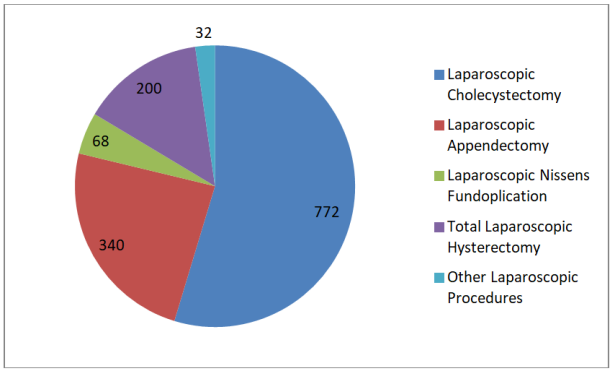
After completion of the procedure the defect in the umbilical tube was sutured using 2-0 vicryl code 2357 in two interrupted sutures. The skin was closed with subcuticular sutures.

All the patients were followed upto a period of one year either physically or telephonically.

Results

Table 1: Procedures

S. No.	Procedures	No. of Procedures
1	Laparoscopic Cholecystectomy	772
2	Laparoscopic Appendectomy	340
3	Laparoscopic Nissens Fundoplication	68
4	Total Laparoscopic Hysterectomy	200
5	Other Laparoscopic Procedures	32



Graph 01: Procedures

All The patients were followed up to one year period.

The patients were followed up for

a. Port site infection

b. Port site hernia

c. Port site pain and discomfort

Port Site Infection

350 patients were followed telephonically as regular follow up was not needed after 3 month period. There was no incidence of port site infection or port site hernia. The average time for the umbilical wound to heal completely was 10 days. There has been Umbilical port-site infection during cholecystectomy is reported to be 9% (1,2) even for a difficult cholecystectomy[6].

All the patients did not show signs of infection up to a period of one year. 32 patients (2%) showed a minimal discharge for 7 days which was resolved without additional treatment. We advised alternate day dressings to all the patients for 10 days.

Port Site Hernia

There was no incidence of Port site hernia at umbilicus with our technique. The incidence of port site hernias ranges from 0.5 percent to 5 percent in various series. Umbilical port site infection can predispose an umbilical hernia. Early control of umbilical port site infection can prevent this.

Visceral and Vascular Injuries

There was no incidence of visceral or vascular injury in our series. Studies have suggested that 30-50% of bowel injuries and 13-50% of vascular injuries are undiagnosed at the time of surgery. Since bowel injury is more common than vascular injury, it is more likely to produce serious sequelae because of the delay in diagnosis. The mortality rate from bowel injury is 2.5-5%.

Statistical Analysis

During the study we have found zero complication rates in our parameters of Port site infection, Port site Hernia, Visceral and Vascular injuries with the above results no statistical analysis has been applied.

Figure 1: Vertical infra umbilical incision

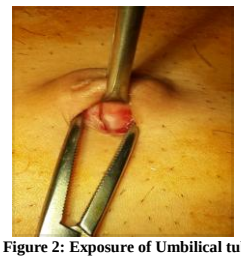


Figure 2: Exposure of Umbilical tube

Figure 3: Continuous upward skin traction

Figure 4: Vertical opening made at umbilical tube

Figure 5: Closure of Umbilical tube using 2-0 Vicryl TM sutures

Discussion

The worry of most surgeons performing laparoscopy is umbilical sepsis which ends mostly in umbilectomy if unresolved with conservative management[7]. The risk of omphalitis is upto 9% in most of the studies. In our series there were no cases of omphalitis. Our technique also offers cosmetic advantage preserving the original shape of umbilicus. However, metanalysis may needed to compare different IP access techniques. The role of umbilical cleaning beforehand is of utmost importance[8].

Conclusion

Intraperitoneal (IP) access is the first and important part of any laparoscopic procedure. Among the closed and open techniques of IP access, the open technique or the Hassens Technique has advantages in terms of port site complications. In view of the above, we have modified the open technique with intraperitoneal access via the umbilical tube technique. In our technique the shape of the umbilicus is maintained which gives a distinct cosmetic advantage. In this study achieving a zero complication rates has motivated us to standardise, share and propagate this technique.

Importance of preparation of umbilicus should also be emphasised as in all our cases cleaning of umbilicus before surgery was performed. Earlier very few studies have been published with small sample size (8) and have shown good results with the umbilical tube technique. We can conclude that this technique is the best technique based on our study however further meta analysis can be done comparing the different techniques of intraperitoneal access in laparoscopic surgery.

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